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Analysis of the first R&D projects of the European Defence Fund

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Executive Summary

On the 7th of June 2017, the European Commission officially launched the European Defence Fund (EDF), a programme for financing research on military products and technology. It was the first time that the EU earmarked resources to strictly military research. The Defence Fund is part of the process of militarisation begun by the EU several years ago.

Work began on drawing up the first EDF work programme in 2021. A call for projects was made and the list of those that had been approved was published on the 25th of January 2023.

Out of the 142 projects submitted, 60 were selected, for which a budget of €1,166 million was allocated. This paper gives a general overview of the approved projects and a more detailed description of fourteen of them.

The selected projects are spread over various fields —Naval Combat, Land Combat, Air Combat, Air and Anti-Missile Defence, and Mobility and Military Protection encompass thirteen projects, all of which are clearly of a military nature. They will receive funding of €597.1 million, making up 51.21% of the total budget.

A technical analysis of a representative sample of fourteen of these projects has also been included. All of these can be regarded as fitting ill with the EU's foundational principles and values. As if this were not bad enough, the projects proposing the use of new deep-learning techniques in Artificial Intelligence (A.I.) are worrying given their inherent proneness to error, 'The Black Box Nature' of A.I. and the need for 'explicability', and to lack of proper oversight in A.I.'s use. Military A.I. systems should be rigorously scrutinised by acknowledged non-military experts and ethics committees — something that can all too easily go by the board.

A section has been devoted to corruption in the Defence Industry, a widely prevalent practice in this sector. Some of the European companies with major involvement in the approved projects of the EDF have lengthy records of corruption and fraud. Spanish companies are no exception. Several examples of misconduct by Spanish companies participating in some of the approved projects are described.

The Spanish Defence Industry will play a highly relevant role in this initial EDF programme. Out of the 60 approved projects, 42 involve participation from Spanish entities (companies, research centres, universities), amounting to €1,027 million, which is 88% of the total funding. Spanish entities will take part in eleven out of the thirteen projects encompassing the areas of Naval Combat, Land Combat, Air Combat, Air and Anti-Missile Defence, as well as Mobility and Military Protection, with a funding allocation of €562.9 million. They are also present in ten out of the eleven projects with the highest subsidies (exceeding €30 million).

A brief reflection is made on Spanish public universities' participation in these projects.

To carry out this work, we have drawn heavily on EU data in making our analysis and reaching our conclusions. Our key findings include: (1) the EDF subsidies will fund the research and development projects for later weapons production; (2) the EDF will greatly boost military spending in Europe. On the other hand, we verified the strong involvement of the arms industry — something that is in keeping with Spain's ranking among the world's top ten arms exporters for years now. Last but not least, even though some of the companies awarded EDF subsidies have long records of corruption, irregularities, and misconduct, this has not stopped The European Commission from showering them with public funds.

INDEX

1. INTRODUCTION (BACKGROUND)

For years, the European Union has chosen the path of militarisation and rearmament with a dual purpose: on one hand, to safeguard its economic and geopolitical interests (namely, control over trade routes and access to increasingly scarce natural resources), and on the other hand, to fortify itself against migratory flows. This paper reveals one of the avenues that the EU has taken as part of this growing militarisation.

In 2015, the European Commission established an Advisory Council (known as 'The Group of Personalities') with the mission of providing advice on military research, and invited the European Defence Industry to take part in it. The weight of the Defence Industry in this Group was notable: out of the 16 members, seven were the CEOs of arms companies (Indra, MBA, Saab, Airbus, BAE Systems, Leonardo, Liebherr-Aerospace), two were the heads of military research centres (Fraunhofer-Gesellschaft and TNO), one was the director of an international studies institute (Finnish Institute of International Affairs), and only 6 were European politicians. The proposal to begin a Defence Research funding plan aimed at promoting a technological and industrial base for European Defence emerged from the industrial sector. The Group of Personalities included this proposal in the report it presented to The European Commission. The Commission readily embraced the recommendations of the report and set to work on the creation of the so-called European Defence Fund (EDF).[1] Thus, the industry has played a crucial role in the implementation of the EDF.

For the first time in the history of the EU, funding from The Union's budget will finance the research and development of strictly military products and technology. The Fund has been incorporated into the EU's current Multi-annual Financial Framework 2021-2027. Public funds will subsidise research projects (100% of the costs covered by the EU) and projects for the development of military products and technology (20% covered by the EU and 80% covered by The Member States). Therefore, for development projects, EU funding will have a multiplier effect, resulting in the total expenditure being five times that contributed by the Fund. The European Defence and Security Industry will conduct this research, receive grants from the Fund, retain the intellectual property rights to the research results, and ultimately profit by selling these outcomes to The Member States, as mandated by the EDF's regulations. This is a masterstroke by the industry, which advised the public financing of military research and will be the main beneficiary of the EDF's implementation. In the 2021-2027 Financial Framework, the EDF has an allocation of €8,000 million,[2] which will be supplemented by contributions from The Member States for military development projects.

Decision-making power over the management and development of the Fund, as well as the selection of projects to be subsidised, was granted to the European Commission, without the involvement of the European Parliament. The Commission can appoint independent experts to assist in the evaluation of proposals. These experts will come from Ministries of Defence and subordinate agencies, research centres, universities, business associations, or companies in the defence sector. In other words, the same groups that can potentially apply for subsidies can also par-

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1. Teresa de Fortuny and Xavier Bohigas; *Fons Europeu de Defensa. La voluntat de la UE d'incrementar la seva despesa militar i afavorir el sector armamentista.* Centre Delàs Working Paper, April 2019. https://centredelas.org/publicacions/working-paper-fons-europeu-de-defensa/

> For the first time in the history of the EU, funding from The Union's budget will finance the research and development of strictly military products and technology

2. Translator's note: Confusion is often caused by the term 'billion', which in US usage means 109 but which in many European countries (including traditional British usage) means 1012. Accordingly, 100,000,000 (109) will be termed 'a thousand million' [in French, *milliard*], following The Long Scale [*échelle large des nombres*] convention.

ticipate in the evaluation of the proposals. The list of experts will not be made public. Transparency cannot be assumed.

It should be added, as an aside, that to address the aforementioned migration phenomenon, the European Commission decided in the 2000s to finance the development of security technologies from the Union's budget, thus promoting a robust European security industry. In recent years, it has been observed that the defence industry has been expanding its production towards security and surveillance technology: radars, detection systems, surveillance devices, biometric identification tools, and all the technology intended for border walls. All of this with the purpose of fortifying the European Union against migration flows. The defence and security sector benefitted from this development.

2. PROJECTS APPROVED IN THE FIRST EDF PROGRAMME

In 2021, the first work programme of the EDF was launched. During the last quarter of that year, the period for the submission of projects eligible for funding was opened. On January 25, 2023, the list of approved applications was published. Out of the 142 projects that were submitted, 60 were selected (involving 692 entities from 26 EU member states and Norway, a non-EU country[3]). The average participation per project is eighteen entities based in eight EU member states. The budget allocated to the 60 approved projects amounts to €1,166 million. Military research projects will receive €322 million, while military development projects will receive €845 million, complementing national contributions. A quarter of the projects to be subsidised (fifteen) have a connection with PESCO (Permanent Structured Co-operation), which is the European Union's Security and Defence Policy through which 25 out of the 27 national armed forces pursue structural integration. This is in line with the consideration of PESCO as a priority for The European Union. In the presentation of the selected projects,[4] it is stated that with this selection, the EDF will support projects involving next-generation combat aircraft, tanks, and ships. It will also encompass critical defence technologies such as Artificial Intelligence, semiconductors, space, military cloud computing, cyber capabilities, and disruptive technologies. Furthermore, the fund will also leverage promising small and medium-sized enterprises or start-ups (accounting for 18% of the funding volume and 43% of the entities involved in the selected projects are small and medium-sized enterprises).

The approved projects are spread across various thematic fields. The areas of Naval Combat (€103.5 million), Land Combat (€154.7 million), Air Combat (€189.8 million), Air and Anti-Missile Defence (€100 million), and Mobility and Military Protection (€49.1 million) account for a total of thirteen projects. All of these areas fall within the military domain and cannot be categorised as dual-use or multi-purpose themes. Most of the higher-budget projects are included in these fields. The total allocated funding for all these fields amounts to €597.1 million, which is 51.21% of the total funding.

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3. The EDF Regulations give scope for participation by non-EU nations in the EU-subsidised projects.

The budget allocated to the 60 approved projects amounts to €1,166 million

4. European Commission. European Defence Fund 2021 Calls for Proposals – Results. https://defence-industry-space.ec.europa.eu/funding-and-grants/calls-proposals/european-defence-fund-2021-calls-proposals-results_en

The other areas are: Cybernetics; Disruptive Technologies; Energy and Environment; Materials and Components; Defence Innovation; Materials and CBRN (Chemical, Biological, Radiological, and Nuclear Threats); Sensors; Space; and Information Superiority. Out of the 60 selected projects, 11 will receive subsidies of over €30 million. Another 17 will receive subsidies ranging between €10 and 30 million. The remaining 32 have been allocated subsidies below €10 million. The highest subsidy amount is €100 million, assigned to a project in the Air and Anti-Missile Defence area. Projects with major subsidies are often linked to PESCO.

In Table 1, we present all the approved projects grouped by themes, along with their budget allocations. In the last column, we indicate the Spanish entities taking part in each project, highlighted in bold if they are the co-ordinators of the respective project.

Table 1. Approved projects

Subject	Project	Est. cost (Euros)	Max. EU contribution (Euros)	Spanish participation
Air Combat	EPIIC	77.769.904	74.999.974	Airbus Defence and Space SA Indra Sistemas. SA. Tecnobit SL
	EICACS	82.506.596	74.810.330	Airbus Defence and Space SAU Gmv Aerospace And Defence SAU Indra Sistemas SA Instituto Nacional de Técnica Aeroespacial Sener Aeroespacial SA Universidad Politécnica de Madrid
	ENGRT	40.138.077	40.000.000	Aernnova Engineering Division SAU Indra Sistemas SA Industria De Turbo Propulsores SAU
Air and Missile Defence	EU HYDEF	109.987.858	99.988.962	**Sener Aeroespacial SA (Coordinator)** Escribano Mechanical And Engineering SL Gmv Aerospace And Defence SA Instalaza SA Instituto Nacional de Técnica Aeroespacial Esteban Terradas Navantia SA
Information Superiority	5G COMPAD	37.096.363	26.998.532	Inster Tecnologia y Comunicaciones SAU
	EuroHAPS	63.520.763	43.000.000	Instituto Nacional de Técnica Aeroespacial Multi-Informática Principado SL Sener Aeroespacial SA Thales Alenia Space España SA

Subject	Project	Est. cost (Euros)	Max. EU contribution (Euros)	Spanish participation
Cyber	ACTING	17.784.582	16.258.054	Managing & Innovation Business Partners Telefónica Móviles Espana SA
	AInception	8.147.875	8.147.875	---
	EU-GUARDIAN	13.454.545	13.454.545	**Indra Sistemas. SA (Coordinator)** Universidad de Murcia
Digital Transformation	EDOCC	42.252.208	40.000.000	GMV Aerospace And Defence. SAU Indra Sistemas SA Navantia SA. Thales Espana Sistemas SA
	KOIOS	9.989.713	9.989.713	**CT Ingenieros Aeronáuticos de Automoción e Industriales SL (Coordinator)** Barcelona Supercomputing Centre- Centro Nacional de Supercomputacion Mitiga Solutions SL NTT Data Spain
	FaRADAI	18.498.239	18.498.239	Fundación Tecnalia Research & Innovation Indra Sistemas SA Thales Programas de Electronica y Comunicaciones SA Universidad Politécnica de Madrid
Disruptive Technologies	ROLIAC	3.978.712	3.978.712	Aerotecnic Metallic SL Lortek S Coop
	ENLIGHTEN	8.424.382	8.424.382	**Universidad de Zaragoza (Coordinator)**
	ADEQUADE	27.433.831	27.433.831	Fundacio Institut de Ciències Fotòniques Indra Sistemas SA Sener Aeroespacial SA
	iFURTHER	10.955.937	10.955.937	Indra Sistemas SA Universidad de Alcalá
Energy and Environment	INDY	14.229.475	14.229.475	Equipos Móviles de Campaña Arpa. SAU Indra Sistemas SA Instituto Nacional de Técnica Aeroespacial Esteban Terradas
	NEUMANN	56.419.440	48.919.439	Axter Aerospace
	NOMAD	20.718.040	19.687.421	**Equipos Móviles de Campaña Arpa SAU (Coordinator)** Fundación Imdea Energía Instituto Nacional de Técnica Aeroespacial Thales Espana Sistemas SA

Subject	Project	Est. cost (Euros)	Max. EU contribution (Euros)	Spanish participation
Ground Combat	MARSEUS	27.299.030	25.000.000	----
	FAMOUS2	122.453.463	94.848.156	Escribano Mechanical & Engineering SL Indra Sistemas SA Piedrafita Systems SL
	NEWHEAT	9.988.212	9.988.212	Instalaza SA
	COMMANDS	26.835.190	24.844.238	**Sener Aeroespacial SA (Coordinator)** Indra Sistemas SA Instituto Nacional de Técnica Aeroespacial Esteban Terradas Santa Barbara Sistems SA
Materials and Components	ECOBALLIFE	10.004.286	10.004.286	**Fundación Tecnalia Research & Innovation (Coordinator)** Asociación de Investigación de la Industria Textil Ethical & Legal Plus SL Industrial Olmar SA
	AGAMI_ EURIGAMI	24.555.323	24.555.323	Airbus Defence and Space SA Indra Sistemas SA Universidad de Vigo Universidad Politécnica de Madrid
Medical Response and CBRN	COUNTERACT	56.155.640	49.071.899	-----
	TeChBioT	4.328.983	4.328.983	-----
	MoSaiC	4.401.671	4.401.671	-----
Naval	EPC	65.791.616	60.000.000	Navantia SA
	EDINAF	29.000.198	29.000.000	**Navantia. SA SME (Coordinator)** Aertec Solutions SL Indra Sistemas SA Universidade da Coruña
	dTHOR	14.500.000	14.500.000	National Institute Of Aerospace Technology Navantia SA Saes SME Técnicas y Servicios de Ingeniería
Open SME calls - Innovative and future-oriented defence solutions	ALADAN	3.235.279	3.143.675	---
	ABITS	2.455.309	2.225.407	----
	HYBRID	3.356.586	3.163.713	----
	SPRING	3.675.873	3.675.873	----
	ALTISS	3.860.321	3.202.501	-----
	SHOLFEA	3.097.603	2.774.309	**Gahn Logística Gestión y Consultoría SA (Coordinator)** Instalaza SA Startiun SL

Subject	Project	Est. cost (Euros)	Max. EU contribution (Euros)	Spanish participation
Open SME calls - Innovative and future-oriented defence solutions	RFSHIELD	4.308.370	3.420.390	**Integrasys SA (Coordinator)** Aicox Soluciones
	NAUCRATES	5.020.533	4.000.000	Integrasys SA TTI Norte SL
	P2P-FSO	3.718.121	3.466.128	Twoptics Systems Design SL
	POWERPACK	3.494.531	3.494.531	Cidete Ingenieros SA
	POWERFLEX	3.458.087	3.458.087	----
	SMiEQ	3.559.716	3.494.090	----
	HIDRA	3.996.992	3.996.992	---
	IntSen2	3.289.125	3.289.125	**Tracasa Instrumental SL (Coordinator)** European Union Satellite Centre Zabala Innovation Consulting SA
	LODESTAR	3.740.721	3.740.721	E&Q Engineering
	Mini-BOT	3.429.599	3.429.599	-----
	SEAWINGS	3.927.342	3.927.342	**La Palma Research Centre Sl (Coordinator)** Universidad Politécnica de Madrid
	Nano-SHIELD	3.997.500	3.997.500	Acondicionamiento Tarrasense Associación
	Q-SiNG	3.855.716	3.855.716	**Geonumerics Sl (Coordinator)** Iqua Robotics SL
	FIBERSENSE	3.386.861	3.386.861	---
	Facelift	3.544.262	3.544.262	----
	AMLTD	2.868.733	2.868.733	----
	HEGAPS	3.998.363	3.998.363	**Seaplace S.l (Coordinator)** Edair Technologies. SL Fundación Centro de Tecnologias Aeronáuticas Suprasys SL
Protection and Mobility	ACHILE	44.999.168	39.997.054	Amopack SL GMV Aerospace and Defence SA Gogoa Mobility Robots SL Indra Sistemas SA
	SDMMS	10.823.062	9.102.281	----

Subject	Project	Est. cost (Euros)	Max. EU contribution (Euros)	Spanish participation
Sensors	HEROIC	19.081.739	17.999.998	**Indra Sistemas SA** Universidad de Sevilla
	ARTURO	19.989.830	19.989.830	**Indra Sistemas SA** Universidad de Sevilla
Space	EPW	29.915.881	25.000.000	**Indra Sistemas SA** TTI Norte SL
	NAVGUARD	56.228.592	24.372.921	GMV Aerospace and Defence SA Hisdesat Servicios Estrategicos SA Indra Sistemas SA Tecnobit SL
	TOTAL	**1.322.933.967**	**1.166.334.191**	

Columns three and four indicate the estimated project cost and the maximum EU-approved contribution.
The last column indicates the Spanish companies or entities taking part in each project. Spanish entities co-ordinating the project have been highlighted in bold. Source: European Defence Fund 2021 Calls for Proposals – Results. https://defence-industry-space.ec.europa.eu/funding-and-grants/calls-proposals/european-defence-fund-2021-calls-proposals-results_en

CORRUPTION AND BUSINESS MISCONDUCT

Unfortunately, corruption is rife in the Defence Industry. A joint report[5] by TNI and ENNAT describes some of these fraudulent practices by five major European defence companies, specifically Leonardo, Safran, Thales, Airbus, and Saab.

All of them are taking part in one or more of the 60 selected projects in the EDF's first work programme. In fact, as Table 1 shows, they are involved in many of the projects.

Furthermore, the CEOs of Leonardo, Airbus, and Saab were part of the Group of Personalities from which the proposal to implement a Defence Research Funding Plan emerged, which ultimately led to the creation of the EDF. This means that, despite their lengthy histories of corruption and irregularities, The European Commission did not hesitate first to invite them to participate in the 2015 Group of Personalities and second to select projects in which they participate or even co-ordinate.

Spain is by no means an exception here. *Defex* — The State-owned Defence company — is no stranger to scandal. The firm was charged with corruption in international commercial transactions, money-laundering, embezzlement, and falsification in contracts with the Government of Cameroon.[6] Contract awards in Egypt, Brazil, Saudi Arabia, and Angola were also investigated.

Focusing on the context of this paper, some of the Spanish companies taking part in EDF projects have also been accused of corruption or fraud. Let us take a few examples:

Indra: One of the companies involved and investigated in the judicial process of the *Púnica*[7] scandal. According to Judge García Castellón, Indra has been a "unique part in the concert orchestrated by leaders of the Madrid PP to use the public coffers of the entity ICM as a source

5. Mark Akkerman, Pere Brunet, Andrew Feinstein, Tony Fortin, Angela Hegarty, Niamh Ní Bhriain, Joaquín Rodriguez Alvarez, Laëtitia Sédou, Alix Smidman, Josephine Valeske; *Fanning the flames. How the European Union is fuelling a new arms race*; European Network Against the Arms Trade (ENAAT), Stop Wapenhandel and Transnational Institute (TNI); Amsterdam, March 2022; https://centredelas.org/wp-content/uploads/2022/04/Report_FanningTheFlames_ENAAT_TNI_PereBrunet_ENG.pdf

> Despite their lengthy histories of corruption and irregularities, the European Commission did not hesitate to select projects in which they participate or even co-ordinate

6. "Anticorrupción pide 75 millones de multa a la empresa pública Defex por sus adjudicaciones irregulares en Camerún"; *Público*; 12/09/2019; https://www.publico.es/politica/anticorrupcion-pide-75-millones-multa-empresa-publica-defex-adjudicaciones-irregulares-camerun.html

7. Daniel Sánchez Caballero; "La Comunidad de Madrid de Esperanza Aguirre pagó 5,5 millones a Indra..."; *eldiario.es*; https://www.eldiario.es/sociedad/Comunidad-Madrid-Indra-desarrollo-Andalucia_0_982701857.html

of party income." On another note, Indra was fined by the CNMC for being part of a cartel of companies that divided and inflated public contracts.[8] High-ranking executives of Indra have also been implicated in the Operation Lezo case.[9] Incidentally, Indra was also one of the companies included in the 2015 Group of Personalities. Indra participates in 18 EDF projects.
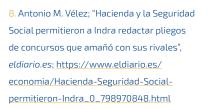
GMV Aerospace and defence S.A.U.: The World Bank has blacklisted a subsidiary of GMV due to, according to the organisation, "collusive, corrupt, and fraudulent practices" in two contracts in Vietnam.[10] This prevents the subsidiary from participating in projects financed by the World Bank. GMV is involved in five EDF projects.

Instalaza S.A.: A paradigm of the revolving door. Pedro Morenés was a director of Instalaza from 2005 to September 2011. In December 2011, he was appointed Minister of Defence. In the three years following this appointment, the Ministry awarded 32 contracts to Instalaza and its subsidiaries.[11] It is worth noting that in 2010, Instalaza S.A. demanded €40 million from the government of Rodríguez Zapatero for "damages and losses" due to the ban on manufacturing cluster bombs following Spain's ratification of the Convention banning these weapons.[12]

3. TECHNICAL ANALYSIS OF PROJECTS FUNDED IN THE 2021 CALL

Some of the projects funded in the 2021 call seek to develop advanced combat systems, while others focus on defence or counterattack.[13] Among the 60 subsidised projects, we have identified a total of fourteen projects based on three features: (1) All of them involve Spanish companies and/or universities; (2) They form a representative sub-group of all projects from a technological perspective; (3) They account for nearly half of the total investment by The European Union in this call, amounting to a total of €576.17 million, which is 49.4% of the total. The first six projects we consider (EPC, FAMOUS2, EICACS, EPIIC, EU HYDEF, and Euro-HAPS) will each receive over €40 million, totalling €447.6 million. These six projects alone already make up 38.4% of the whole budget, even though they only account for 10% of the number of approved projects:

1. **EPC (€60 million):** Naval Combat area. Designing a new patrol corvette that is flexible, interoperable, and cybersecurity-secure.
2. **FAMOUS2 (€94.8 million):** Land Combat area. Designing interoperable armoured vehicles, including prototypes and testing.
3. **EICACS (€74.8 million):** Air Combat area. Collaborative air combat involving both manned and unmanned aircraft (drones).
4. **EPIIC (€75 million):** Air Combat area. Advanced interfaces for pilots.
5. **EU HYDEF (€100 million):** Air and Missile Defence area. Designing endo-atmospheric interceptors.
6. **EuroHAPS (€43 million):** Information Superiority area. High-altitude surveillance and reconnaissance.

8. Antonio M. Vélez; "Hacienda y la Seguridad Social permitieron a Indra redactar pliegos de concursos que amañó con sus rivales", *eldiario.es*; https://www.eldiario.es/economia/Hacienda-Seguridad-Social-permitieron-Indra_0_798970848.html

9. Jose Precedo; "La obsesión de González por no ser grabado costó a Madrid 117.000 euros en teléfonos cifrados pero no evitó las escuchas"; *eldiario.es*; 24th April 2017.

10. Antonio M. Vélez; "El Banco Mundial veta por corrupción en Vietnam a la empresa española que lidera el control de los satélites Galileo"; *eldiario.es*; https://www.eldiario.es/economia/banco-mundial-veta-corrupcion-vietnam-empresa-espanola-lidera-control-satelites-galileo_1_7275050.html

11. Alejandro Torrús; "Morenés reconoce haber firmado 32 contratos con su antigua empresa desde que es ministro"; *Público*. https://www.publico.es/politica/morenes-reconoce-haber-firmado-32.html

12. Cluster Munitions Convention. https://www.icrc.org/es/doc/assets/files/other/icrc_003_0961.pdf

13. Results of the 2021 EDF Calls for Proposals: https://www.frstrategie.org/sites/default/files/documents/specifique/2022/EDF2021-STATISTICS-FRS.pdf

One should note that the group of projects receiving over €40 million also includes the COUNTERACT project (€49.1 million). This project, focused on medical systems for defence and protection against chemical, biological, and radiation attacks and accidents that could affect both military forces and civilian populations, is not considered in this section due to the highly specific nature of its theme and because it does not involve the participation of any Spanish entity, as previously mentioned.

The remaining projects up to the fourteen we analysed have lower funding, although they collectively amount to €128.57 million, which is 11% of the total subsidised in this first call. They are significant due to their technological relevance and have active Spanish participation. These are:

7. **EDINAF (€29 million):** Naval Combat area. Designing a faster reaction architecture for future European digital ships.
8. **COMMANDS (€24.8 million):** Land Combat area. Designing new capabilities for intelligent and co-operative land systems, both manned and unmanned.
9. **EU_GUARDIAN (€13.5 million):** Cybernetics area. A.I.–based solutions for incident management and cyber defence.
10. **KOIOS (€10 million):** Digital Transformation area. Designing secure and robust solutions based on artificial intelligence.
11. **FaRADAI (€18.5 million):** Digital Transformation area. Designing robust artificial intelligence systems for defence applications.
12. **ARTURO (€20 million):** Sensors area. Advanced radar technologies.
13. **NEWHEAT (€10 million):** Land Combat area. Enhancing the performance of conventional-shaped warheads.
14. **SHOLFEA (€2.77 million):** Projects for SMEs area, researching innovative future-oriented defence solutions. Shoulder-launched, soldier-fired missile systems.

Next, we will briefly analyse the technical characteristics of these projects. Out of the total of fourteen projects, eight aim to directly develop combat systems or components thereof, three focus on designing new defence, radar, and reconnaissance systems, and the remaining three focus on new A.I. tools. See Table 1 for details of the Spanish entities taking part in each of these projects.

PROJECTS FOCUSING ON COMBAT SYSTEMS

EPC Project (naval combat)

The EPC project involves the design and development of a limited-capacity warship, either a corvette or a lightweight frigate, with a displacement of 3,000 tons, a draft of under five metres, and a modular design capable of accommodating different configurations based on the operational needs of each country. The resulting vessel from the project will be designed for a wide range of missions, including enhancing maritime surveillance efforts to achieve naval superiority. The outcome will be a unique corvette to be used by Italy, France, Spain, and Greece. The project includes two additional countries (Norway and Denmark) that apparently are not interested in the vessel. This ship will be prepared for "exercising force, particularly in the context of peace-time operations,"[14] encompassing activities such as combating piracy and smuggling, as

14. See: https://armada.defensa.gob.es/ArmadaPortal/page/Portal/ArmadaEspannola/conocenosespeciales/prefLang-es/05feindef--00-2021-FEINDEF--04-EPC

well as engaging in humanitarian assistance and ensuring freedom of navigation. It is one of the most ambitious naval PESCO projects planned, though detailed technical information about specific goals and technologies are not available.

EDINAF project (naval combat)

The EDINAF project aims to incorporate new digital tools into military vessels for maintenance, flexible operation, continuous monitoring of the vessel's overall condition, and achieving quicker response capabilities.[15] The project will be executed based on identifying the digital capabilities to be provided to future digitised vessels and defining the central reference architecture of the vessel. Subsequently, the design and construction of a development platform will be undertaken, which can be used for integration testing and demonstrations. The project seeks to enhance the monitoring of the vessel's condition and operation through sensorisation and massive data exchange. Understanding the real-time state of the vessel's structure will enable rapid response capabilities at all times, optimise maintenance based on real-time status, and provide guidance to the crew in their tasks throughout the vessel's lifecycle.

FAMOUS2 Project (land combat)

The FAMOUS2 project aims to enhance the interoperability of armoured vehicles to meet future demanding requirements, introducing what the participants call "innovation and promising new technologies and concepts." The project builds upon the EDIDP 2020 FAMOUS project and will develop innovative technological blocks for both next-generation armoured platforms and the upgrading of existing platforms. The project includes the design, construction, and testing of prototypes for the future All-Terrain Vehicle (ATV), Light Armoured Vehicle (LAV), and Main Battle Tank (MBT).[16] The project description provides limited technical details and for instance does not spell out whether it involves unmanned armoured vehicles.

COMMANDS Project (land combat)

The COMMANDS project aims to develop new capabilities for the entire lifecycle (Through Life Capabilities, TLC) of both manned and unmanned land vehicles, enabling them to be agile, intelligent, and co-operative. The results will not only update current European land vehicles but also integrate into future vehicles under development, smoothing the transition from manned to unmanned systems and enabling military unmanned land vehicles to operate in unstructured environments with degraded or denied satellite communication and signal scenarios. The project will be based on the development of machine-learning and artificial intelligence-based processing technologies. Technology demonstrators will allow for early risk mitigation and will include both a laboratory demonstrator and a mobile demonstrator in a real-world scenario centred around a last-kilometre resupply convoy with armoured vehicle protection. This is one of the few projects that mentions ethics, aiming to "provide more efficient and effective co-operative intelligent behaviour, with human-centred control following ethical principles."[17] Additionally, its objectives partially overlap with those of FAMOUS2 but with a lower budget and apparently clearer methodologies.

15. See: https://armada.defensa.gob.es/ArmadaPortal/page/Portal/ArmadaEspannola/conocenosespeciales/prefLang-es/05feindef--00-2021-FEINDEF--04-EPC

16. See: https://ec.europa.eu/info/funding-tenders/opportunities/portal/screen/opportunities/projects-details/44181033/101103043/EDF

17. See: https://ec.europa.eu/info/funding-tenders/opportunities/portal/screen/opportunities/projects-details/44181033/101102635/EDF

NEWHEAT Project (land combat)

The NEWHEAT project aims to find solutions to overcome the most recent and foreseeable threats that will arise in the near future for the armed forces of EU Member States at the level of ground combat. These threats include modern battle tanks equipped with active protection systems and explosive reactive armour, as well as infrastructures that incorporate high-performance concrete. The project seeks to enhance the performance of vehicles by integrating new explosive materials, new coatings, and new geometries. It also focuses on the development of new concepts and demonstrators for warheads.[18] NEWHEAT aims to encompass all the knowledge, technical requirements, and capabilities needed to design, develop, test, and even industrially produce these future warheads.

EICACS Project (air combat)

The objectives of the EICACS project are twofold:[19] The first is the development of design standards and norms to ensure the interoperability of heterogeneous systems (including future air combat systems, legacy platforms, and unmanned systems in scenarios with both manned and unmanned platforms) to support the secure exchange of resources (sensors and effectors) and the exchange of information (such as situational awareness, raw data) between systems and platforms to enhance mission execution and performance. The second is the assessment of issues raised by the implementation of new onboard technologies, including potential airworthiness and safety issues in the event of A.I.-based systems being onboard, for the sake of the overall proper functioning. The project aims to study the compatibility of A.I.-driven tools and processes (such as dynamic resource allocation and decision support) to confirm both their feasibility and airworthiness. The project also aims to ensure European sovereignty concerning A.I. engineering tools for military use.

EPIIC Project (air combat)

Future air combat pilots will have to oversee all platforms (manned/unmanned) in a highly complex environment. This context will require disruptive concepts of human-machine co-operation using new technologies to create a fully immersive environment and a symbiotic team between systems and pilots. The EPIIC project plans to study and develop key technologies related to the fighter cockpit to reduce the workload and stress of combat pilots. By automating certain tasks with machines, we could say that the goal is to move towards semi-unmanned air combat aircraft. The project also aims to achieve European technological autonomy, aiming to eliminate dependencies on third-party technologies in the fighter cockpit (or at least mitigate these dependencies as much as possible). As some tasks will be automated by machines, "the pilot will focus his resources on high-value areas of action, thereby enhancing combat effectiveness." Specifically, the project will study and develop key cockpit-related technologies,[20] such as an adaptive human-machine interface, an innovative interaction system with a virtual assistant, large-area displays, innovative vision technologies (helmet-mounted displays and windshield projection), and crew monitoring systems. These technologies will be platform-independent.

18. See: https://ec.europa.eu/info/funding-tenders/opportunities/portal/screen/opportunities/projects-details/44181033/101102442/EDF

19. See: https://ec.europa.eu/info/funding-tenders/opportunities/portal/screen/opportunities/projects-details/44181033/101103669/EDF

20. See: https://ec.europa.eu/info/funding-tenders/opportunities/portal/screen/opportunities/projects-details/44181033/101103592/EDF

SHOLFEA Project (Missile systems; projects for SMEs)

The SHOLFEA project is a small-scale project aiming to design, proto-type, and test a new family of shoulder-launched weapon systems for soldiers. The goal is to address the current and future operational needs of infantry units in increasingly demanding scenarios (asymmetric and urban environments with armoured threats), according to the project's description. Envisioning units equipped with advanced passive, reactive, and active protection systems, as well as cutting-edge detection means, the project integrates interconnected targeting systems and ammunition with various ranges, calibres, and effects. A modular design will be employed to adapt to the needs of each army, allowing for different configurations compatible with various types of ammunition. One of these configurations involves a new guided ammunition. In this case, the soldier can choose to operate the guided ammunition shoulder-fired or remotely from unmanned ground vehicles, thereby extending the operational range. The project encompasses both system integration and its proof of concept.
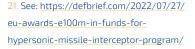
PROJECTS FOCUSED ON DEFENCE, RECONNAISSANCE, AND RADAR SYSTEMS

EU HYDEF Project (air defence and missiles)

The EU HYDEF project is a high-budget project aimed at developing a hypersonic missile interceptor. The objective of this missile interceptor, according to participating entities, is to address threats that may arise beyond the year 2035. The project (including weapon systems and sensors) involves a conceptual design that takes risk mitigation into account, as well as the construction and demonstration of an effective hypersonic endo-atmospheric interceptor prototype with high manoeuvrability and capable of operating at various altitudes. This includes new aerodynamic systems and actuators, agile guidance systems, and advanced sensors/seekers. The system is likely to be based on an extension of the IRIS-T defence system by Diehl Defence,[21] (a German missile company that is part of the consortium), creating a version of this system for defence against hypersonic threats in highly dynamic and changeable scenarios. The final interceptor could end up being a two-stage missile that adapts the basic technology of IRIS-T.

21. See: https://defbrief.com/2022/07/27/eu-awards-e100m-in-funds-for-hypersonic-missile-interceptor-program/

Euro HAPS Project (Information superiority)

The Euro HAPS project will develop three main Lighter-than-Air (LTA) technology demonstrators (a strategic airship, a hybrid airship, and an autonomous stratospheric balloon system) with different types of advanced technologies (LiDAR 3D, communications/infrared, and telecommunications), some of which are novel in Europe. The key aspects of the technologies will be showcased through demonstrators at various locations in the EU, targeting European military forces. The three complementary types of stratospheric platforms include[22] Thales' Stratobus (a solar-powered dirigible airship capable of conducting long-duration missions with a large payload capacity), CIRA's HHAA (Hybrid High Altitude Airship or tactical HAPS), which is a hybrid aircraft that also uses aerodynamic wings; and the ESG and TAO ASBaS (Autonomous Stratospheric Balloon System), consisting of a series of three controllable

22. See: https://ec.europa.eu/info/funding-tenders/opportunities/portal/screen/opportunities/projects-details/44181033/101103150/EDF

altitude balloons. The tests will include a set of LiDAR 3D observations for detecting and classifying targets on land or sea (including detecting objects in vegetation-covered environments) with three-dimensional detection of object shape over the terrain. The demonstrators will include location detection as well as radar systems, using a high-speed telecommunications network to connect ground and aerial actors. Flight demonstrations to test the capabilities of the three types of platforms will take place in Fuerteventura from 2024. The project asserts that "the stratosphere has been an under-used environment to date but it offers scope for conducting long-duration reconnaissance missions, up to a year, at relatively low altitudes (around 20 km). This altitude provides excellent resolutions for observation missions and an excellent communication environment."

ARTURO Project (sensors/radar)

The ARTURO project aims to incorporate cutting-edge technologies and emerging concepts in the field of radar systems, seeking to provide solutions to meet future operational needs based on the widespread use of emerging technologies in the field of advanced radar technologies in Europe. The project aims to deeply analyse operational requirements and the current evolution of threats and environments in various military use scenarios, consolidating state-of-the-art technologies with new concepts and trends in the radar field. In the case of this project, there is limited technical information available, although we know that one of its objectives is to study the use of future microelectronic sensors in the radar industry,[23] supporting the European goal of becoming one of the future manufacturers of microchips.

PROJECTS BASED ON ARTIFICIAL INTELLIGENCE SYSTEMS

EU_GUARDIAN Project (cybernetics)

"The EU_GUARDIAN project aims to create innovative, accurate, and reliable A.I.-based solutions to operate and automate parts of incident management and cyber defence processes. The project seeks to design new A.I.-based techniques for detecting and understanding adversary activity, achieving data collection and storage systems that can dynamically adapt their strategy to perceived situations, and creating automatic or semi-automatic decision systems that consider risks and impacts,[24] all based on A.I. techniques. The project is one of the few that has a public website[25] that provides internal technical details. Although these goals are very hard to achieve, the project aims to ensure human oversight (operators, analysts, and decision-makers at all levels) while also addressing key requirements such as technical robustness, privacy, algorithmic transparency, accountability, and feasibility analysis in proof-of-concept testing. The project's website states that the entire process of analysis, response, and execution will be explainable,[26] and its goal is to ensure an appropriate ethical and legal framework based on the values of the Union and in line with the Charter of Fundamental Rights of the European Union."

23. See: https://www.aalto.fi/en/news/the-eu-funds-a-consortium-with-almost-eur-20-million-in-future-radar-research

24. See: https://ec.europa.eu/info/funding-tenders/opportunities/portal/screen/opportunities/projects-details/44181033/101103044/EDF

25. See: https://www.eu-guardian.eu/

26. Explainable Artificial Intelligence refers to methods and techniques in the application of A.I. that lets human users grasp and interpret its outcomes in each specific case. This is a broader concept that applies to any artifact, system, or machine: explainability is the ability to comprehend its results and the reasons for its incorrect functioning in certain specific cases, in such a way that this understanding allows the system to be altered with a view to avoiding future errors.

KOIOS Project (digital transformation)

The KOIOS project seeks to create new A.I. tools for military command and control systems, as well as intelligent systems that adapt to each specific situation as part of mission equipment. However, both the methodology and the objectives of these new tools are extremely ambitious. Specifically, the project aims to work based on paradigms of responsible research and ethical design,[27] ensuring both the explicability of the results and human control and oversight. The project seeks to use approaches that are better than current ones based on deep learning and deep neural networks, making them robust against potential attacks and easily usable by non-expert operators. Furthermore, the goal is for the results to be consistent and reproducible, so that the system performs equally well in different but similar tests.

FaRADAI Project (digital transformation)

The FaRADAI project aims to create low-cost learning technologies. The goal is for the final system to adapt and learn from its environment, also learning from user supervision autonomously without the intervention of expert developers. The project members believe that these technologies can be highly disruptive and have a significant impact, especially when dealing with highly variable or unpredictable information that requires great adaptability. The proposed methodology includes in-depth research into current advancements in A.I. technologies, alongside a detailed study of the main challenges posed by defence systems, one of which is data confidentiality.

TECHNICAL CONCLUSIONS

In this section, we have conducted a technical analysis of a set of fourteen projects that we consider representative of all other projects from a technological standpoint, and that happen to both account for nearly half of the EU's total investment in this call and to involve participation by Spanish companies and/or universities. In the analysis, they have been split into three groups: (a) projects focused on combat systems; (b) projects focusing on defence, reconnaissance, and radar systems; (c) those more oriented towards A.I. techniques.

In the projects focusing on combat systems, EPC and EDINAF centre on the improvement of military vessels. While the former aims at the complete design of a new corvette or frigate, the purpose of EDINAF is to create new digital tools for the monitoring, control, and maintenance of future digitised ships. The EPC project has limited technical information available compared to EDINAF. Furthermore, one could argue that the technological objectives of both are quite predictable given the current state of developments in military technology. Together, they represent a contribution of €89 million from the EU.

With regard to ground combat, we have analysed the projects FAMOUS2, COMMANDS, and NEWHEAT. The COMMANDS project aims to incorporate improvements in both manned and unmanned ground vehicles, making them agile and 'intelligent,' enabling unmanned land military systems to operate co-operatively in complex, unstructured environments. The FAMOUS2 project shares similar objectives, but with a significant-

27. See: https://ec.europa.eu/info/funding-tenders/opportunities/portal/screen/opportunities/projects-details/44181033/101103770/EDF

ly larger budget and less transparent methodologies. In contrast, the NEWHEAT project focuses on the development of new explosives, warheads, and protective coatings. The projects in this section contribute a total of €129.6 million from the EU. Nevertheless, considering the current shifts in offensive and defensive systems, it is surprising to note that little emphasis is placed on the design and creation of new unmanned ground vehicles (particularly in the FAMOUS2 project).

The section covering aerial combat contains the EICACS, EPIIC, and SHOLFEA projects. The first aims to develop and critically analyse various artificial intelligence technologies for combat aircraft, while EPIIC intends to study and develop key technologies bearing on cockpit design to reduce combat pilots' workload and stress. The SHOLFEA project involves the deployment of portable guided munitions. Together, these three projects contribute a total of €152.5 million from the EU. It is worth noting the EICACS project's stress on evaluating the issues posed by the implementation of A.I. technologies onboard, such as potential concerns related to airworthiness and safety.

On the other hand, projects focused on defence, reconnaissance, and radar systems include EU_HYDEF, Euro HAPS, and ARTURO. The first aims to develop a hypersonic missile interceptor, which is an extension of Diehl Defence's existing IRIS-T defence system. Euro HAPS will work on reconnaissance systems with long-duration observations at 20 km altitude to detect and classify targets on land or at sea. The ARTURO project will specifically focus on advanced European radar technologies. Together, these projects contribute a total of €163 million from the EU. This is an area that we understand will receive ever greater stress given the current concerns of European governments and centres of power regarding Defence, population control, and comprehensive information-gathering.

New A.I. techniques are the stars of the projects analysed in this paper. In addition to the three projects specifically focusing on A.I. (KOIOS, EU_GUARDIAN, and FaRADAI), we find them set out as key tools in another three projects (EDINAF, COMMANDS, and EICACS), and it is highly likely that they are also part of other projects such as EPC, FAMOUS2, Euro HAPS, ARTURO, and SHOLFEA. In total, these new A.I. techniques appear in a range of six to eleven projects out of the total fourteen analysed. Focusing on the three projects that specifically use these tools, the goal of the EU_GUARDIAN project is to support analysts and decision-makers at all levels. However, some of the requirements, such as the ability to detect, mitigate, and respond to security challenges in a semi-automatic or automatic manner, as well as the creation of A.I.-based techniques to understand adversarial activity, seem questionable. In this case, the requirements set forth, which participants claim follow the "key principles of human agency and oversight," could be unrealistic. We observe that the real explicability (as defined earlier in the context of A.I.) and technical robustness of these systems do not align with the proposed goals. It is worrying that there is so much talk of responding to security challenges automatically and understanding adversarial activity,[28] aspects that, from an ethical perspective, should not be left in the hands of machines. Furthermore, the FaRADAI and KOIOS projects share similar features. The former aims to create new technologies that enable autonomous, reliable, and low-cost machine-learning, which can be tricky

28. Tica Font, Pere Brunet, Joaquin Rodriguez (2021) "Robots asesinos, 18 preguntas y respuestas" (in Spanish), Centre Delàs, available at: https://centredelas. org/wp-content/uploads/2021/12/ RobotsAsesinos_18PreguntasYRespuestas_ DEF.pdf - Also see the SKR campaign page: https://centredelas.org/campanyes/stop-killer-robots/?lang=en [English version]

when dealing with highly variable or unpredictable information. We understand that KOIOS questions the reliability of deep-learning systems and aims to go beyond, with the purpose of "developing a reliable human-centred approach (under human control and explainable), integrating ethics-by-design and responsible research paradigms, building trust in A.I. adoption, avoiding ethical, security, and social risks, and ensuring explicability, human control, and human oversight." This statement is particularly relevant because it acknowledges the low reliability and inherent problems in A.I. systems that are used by other projects in this same call, which, along with the lack of transparency, will likely lead to rising civilian casualties.[29]

Artificial intelligence can be controversial and risky when used in military systems, as the likelihood of error in these systems can never be zero.[30] Risk-free A.I. systems do not exist, and in critical combat systems, errors can result in victims, often civilians. Deep-learning (DL) based techniques are 'black boxes', making them unexplainable and rendering accountability well-nigh impossible. Furthermore, remotely controlling unmanned weapons affects the moral responsibility of operators and unfairly puts the blame on them when things go wrong. It also places major cognitive demands on human operators.

Systems for target localisation, tracking, and designation, as well as recognition, even when supervised by human operators, can become problematic due to automation bias. As a result, military A.I. systems should be subject to strict scrutiny by recognised non-military experts and ethics committees.

In any case, we consider that all projects should be regarded as controversial from the perspective of the foundational principles and values of the European Union (inclusion, tolerance, justice, solidarity, non-discrimination, promotion of peace, inviolability of human dignity, and defence of human rights).[31]

4. SPANISH PARTICIPATION

The Spanish Defence Industry will play a key role in this first call of the EDF. Among the 60 approved projects, Spanish entities (companies, research centres, universities) are taking part in no fewer than 42 of them. Since some entities collaborate in more than one project, these 60 selected projects involve 116 participations by Spanish entities. The total amount of grants awarded to these 42 projects (with Spanish participation) amounts to €1,027 million, 88% of the total funding.

Spanish entities will take part in eleven out of the thirteen projects that make up the Naval Combat, Land Combat, Air Combat, Air and Missile Defence, and Military Mobility and Protection fields. The total grants for these eleven projects amount to €562.9 million.

They are also involved in ten out of the eleven projects with the highest grants (those with amounts exceeding €30 million).

The eleven projects with the highest grants: EICACS: €74.8 million; EPIIC: €75 million; EU HYDEF: €100 million; EPC: €60 million; ACHILE: €40 million

29. The opacity of these military projects will spawn a lack of control that will likely lead to sloppy design and a higher percentage of errors in A.I.-based systems, which in turn will lead to more civilian casualties and more 'collateral damage'.

30. See: https://tnishop.org/products/fanning-the-flames

Deep-learning (DL) based techniques are 'black boxes', making them unexplainable and rendering accountability well-nigh impossible

Military A.I. systems should be subject to strict scrutiny by recognised non-military experts and ethics committees

31. See: https://europa.eu/european-union/about-eu/eu-in-brief_en

All projects should be regarded as controversial from the perspective of the foundational principles and values of the European Union

The Spanish Defence Industry will play a key role in this first call of the EDF. Among the 60 approved projects, Spanish entities are taking part in no fewer than 42 of them

(these first five are linked to PESCO); ENGRT: €40 million; EuroHAPS: €43 million; EDOCC: €40 million; NEUMANN: €48 million; FAMOUS2: €94.8 million; COUNTERACT: €49.1 million (the only one without Spanish participation).

The major Spanish defence companies are taking part in these 60 approved projects to a greater or lesser extent. Among them, Indra stands out, with involvement in 18 projects, co-ordinating one. Navantia follows (which also co-ordinates one project), along with GMV Aerospace and Defence and Sener, all with participation in 5 projects. Sener, in particular, co-ordinates two projects, one of which is the only one in the area Air and Missile Defence field, and has the highest grant (€100 million). Next come Thales (4 projects) and Airbus (3 projects). The remaining companies collaborate only in one or two projects. The main Spanish military research centre, INTA, participates in 7 projects. In total, Spanish entities will co-ordinate 14 (23%) of the 60 projects, nearly one in four. Table 2 lists all the Spanish entities participating in this first EDF programme and the number of projects each of them is involved in.

The EU provides the funding allocation for each participating entity of the 60 approved projects. We have calculated for each Spanish entity the total it will receive in this first EDF call, by summing up its allocations in each of the projects it is taking part in. The results are presented in Table 2. The total that will be allocated to the Spanish Defence Sector is well over €111 million, which comes to 10% of the budget of this first EDF work programme. In fact, this figure will be even higher since, for four of the projects with Spanish participation, the EU has not yet published the breakdown of the grant among the participating entities. Considering that the four projects for which the breakdown is missing are all well-endowed (EU HYDEF, €100 million; ECOBALLIFE, €10 million; EPC, €60 million; and ARTURO, €20 million), the share snapped up the Spanish Defence Industry is a juicy one.

Table 2. Spanish entities taking part in EDF

Entity	Projects taking part in	Total funding (Euros)
Indra Sistemas SA	18	27.032.362
Airbus Defence and Space SA	3	13.069.297
Sener Aeroespacial SA	5	8.894.922
Navantia SA	5	4.835.128
Thales España Sistemas SA	4	4.386.757
GMV Aerospace and Defence SA	5	4.327.067
Instalaza SA	3	3.010.101
Tecnobit SL	2	2.789.499
Instituto Nacional de Técnica Aeroespacial	7	2.689.380
Equipos Móviles de Campaña ARPA SAU	2	2.455.289
Santa Barbara Sistems SA	1	2.331.395
Universidad Politécnica de Madrid	4	2.312.898

Entity	Projects taking part in	Total funding (Euros)
Universidad de Murcia	1	1.740.000
Geonumerics SL	1	1.698.321
Piedrafita Systems SL	1	1.680.413
Universidad de Zaragoza	1	1.414.293
CT Ingenieros Aeronauticos de Automoción e Industriales SL	1	1.397.630
Axter Aerospace SL	1	1.354.750
Integrasys SA	2	1.349.092
Escribano Mechanical and Engineering SL	2	1.288.557
Barcelona Supercomputing Center	1	1.271.317
TTI Norte SL	2	1.142.555
Fundación Imdea Energia	1	1.031.810
Fundación Centro de Tecnologias Aeronáuticas	1	996.037
Seaplace SL	1	946.060
La Palma Research Centre SL	1	878.761
Mitiga Solutions SL	1	841.067
Universidad de Sevilla	2	771.625
Edair Technologies SL	1	749.619
Universidad de Alcalá	1	691.433
NTT Data Spain SL	1	684.192
Fundació Institut de Ciències Fotòniques	1	622.938
Industria de Turbo Propulsores SAU	1	600.000
Telefónica Móviles España SA	1	597.312
Gogoa Mobility Robots SL	1	595.681
Managing & Innovation Business Partners SL	1	572.250
Twoptics Systems Design SL	1	566.195
Tracasa Instrumental SL	1	560.790
Lortek S Coop	1	544.025
E&Q Engineering Solutions and Innovation SL	1	509.514
Aicox Soluciones SA	1	466.633
Universidad de Vigo	1	417.957
Inster Tecnologia y Comunicaciones SA	1	409.197
Sociedad Anónima de Electronica Submarina SME	1	406.500
European Union Satellite Centre	1	405.234
Fundación Tecnalia Research & Innovation	2	399.875
Aernnova Engineering Division SAU	1	399.750
Técnicas y Servicios de Ingeniería SL	1	382.125
Universidade da Coruña	1	377.461
Acondicionamiento Tarrasense Associación	1	376.955
Suprasys SL	1	349.807

Entity	Projects taking part in	Total funding (Euros)
Multi-Informatica Principado SL	1	304.250
Zabala Innovation Consulting SA	1	300.672
Aerotecnic Metallic SL	1	292.524
Aertec Solutions SL	1	256.941
Iqua Robotics SL	1	249.491
Cidete Ingenieros SL	1	200.000
Startiun SL	1	147.014
Amopack SL	1	144.505
Gahn Logística Gestion y Consultoria SA	1	142.308
Hisdesat Servicios Estrategicos SA	1	114.800
	TOTAL	111.774.331

No data is available for the EU HYDEF, ECOBALLIFE, EPC, and ARTURO projects
Data source: https://ec.europa.eu/info/funding-tenders/opportunities/portal/screen/opportunities/projects-results;programCode=EDF

PARTICIPATION BY SPANISH UNIVERSITIES

It is worrying that several public universities and research centres in Spain are involved in military research (see tables 1 and 2). Notably, the Polytechnic University of Madrid is collaborating in four projects, and the University of Zaragoza is co-ordinating one of them. The University of Seville is also involved in 2 projects, while the universities of Vigo, A Coruña, Alcalá, and Murcia each participate in one project. Additionally, research centres such as the Barcelona Supercomputing Centre, the Institute of Photonic Sciences (ICFO), and the Palma Research Centre, which is co-ordinating a project, are also involved.

University recipients of project funding more likely reflect the interests of a specific research group in a given field, or that group's need for funding than reflecting the views of the university community. Nevertheless, the relevant Vice-Rectorate of the university must approve the research proposals. In this regard, we believe universities should seriously debate their potential involvement in military research and the issues this raises.

5. CLOSING COMMENTS AND CONCLUSIONS

All EU Member States are taking part in this EDF call with the singular exception of Malta. While consensus among EU Member States is often lacking on other issues, monolithic consensus seems to reign in the military sphere.

One should note that some of the companies receiving grants have long histories of corruption, irregularities, and questionable practices. This is the case, for example, with Spain's Indra and GMV Aerospace and Defence, Italy's Leonardo, France's Thales, among others. However, none of this has stopped The European Commission's decision showering them with public funds.

**CENTRE DELÀS
D'ESTUDIS
PER LA PAU**

We also cannot forget that EDF grants are for R&D projects. The results of these projects will later serve as the foundation for manufacturing prototypes and forging ahead with weapons systems. According to EDF regulations, these same EU Member States will be required to purchase these products. This means the European Defence Industry is set to make a killing, with guaranteed sales and customers.

We note the Spanish Arm's industry strong involvement here. This is little wonder given that Spain has been one of the world's top ten arms exporters for years now.[32] However, this leading position is not seen in most other industrial sectors in Spain.

The EDF is set to greatly boost military spending in Europe, both through the EU's Community Budget and through Member States' national budgets. These funds will co-finance development projects and Member States will also be required to purchase the products arising from the research.

All the resources being frittered away by the EU on growing militarisation would be much better spent on Welfare and Social Justice. Furthermore, in the face of potential conflicts, this militaristic and armament-focused stance (which predates the war in Ukraine) leads to a preference for war over diplomacy, dialogue, and international co-operation.

It is worrying that several public universities and research centres in Spain are involved in military research

32. Siemon T. Wezeman, Pieter D. Wezeman and Alexandra Kuimova; *Trends in International Arms Transfers*, 2021. SIPRI, Stockholm. March, 2022. https://www.sipri.org/publications/2022/sipri-fact-sheets/trends-international-arms-transfers-2021