

THE MISSING PIECES OF EUROPEAN ARMAMENTS COOPERATION: THE EU'S
PESCO AND EDF

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ABSTRACT

Eric Schichlein: THE MISSING PIECES OF EUROPEAN ARMAMENTS COOPERATION:
THE EU'S PESCO AND EDF
(Under the direction of Holger Moroff)

Armaments cooperation, theoretically, allows states to develop capabilities that they alone could not. Yet, armaments cooperation's reality differs from theory: states haggle over conflicting requirements and parochial workshare demands. This thesis evaluates the EU's Permanent Structured Cooperation (PESCO) and European Defense Fund (EDF) in terms of their organizational design and co-development projects. PESCO's organizational design displays middling path dependency, and the EDF's a lesser degree. From this, I devise three expectations for their projects, and test them by building an open-source database of PESCO projects' progress towards their goals. This thesis corroborates my initial two expectations. First, PESCO and EDF-funded projects comprehensively reflect the EU's capability development priorities, and more ambitious projects arose in response to EU recommendations. Second, EU-funded PESCO projects demonstrate more progress than those without funding, several of which demonstrate no progress. Contrary to my third expectation, cooperation, in terms of projects managed cooperatively, did not increase.

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LIST OF ABBREVIATIONS

C2	Command and Control
CARD	Coordinated Annual Review on Defense
CBRN	Chemical, Biological, Radiological, Nuclear
CDP	Capability Development Plan
CFSP	Common Foreign and Security Policy
CSDP	Common Security and Defense Policy
DG DEFIS	Directorate-General for Defense Industry and Space
DTIB	Defense Technology Industrial Base
EDA	European Defense Agency
EDF	European Defense Fund
EDIDP	European Defense Industrial Development Program
EEAS	European External Action Service
EPC	European Patrol Class or European Patrol Corvette
EUGS	EU Global Strategy
EUMC	EU Military Committee
EUMS	EU Military Staff
GDP	Gross Domestic Product

IEPG	Independent European Program Group
LoA	Level of Ambition
MBT	Main Battle Tank
NATO	North Atlantic Treaty Organization
OCCAR	Organization for Joint Armament Cooperation
PADR	Preparatory Action on Defense Research
PESCO	Permanent Structured Cooperation
PMG	Politico-Military Group
pMS	Participating Member States
PSC	Political and Security Committee
QMV	Qualified Majority Voting
R&D	Research and Development
R&T	Research and Technology
SME	Small- and Medium-sized Enterprises
WEU	Western European Union

CHAPTER 1: INTRODUCTION AND BACKGROUND

Though Russia's expanded war of aggression against Ukraine unleashed a flood of defense spending by EU member states, it also exposed the enormous scale of the challenges confronting European militaries. Since the end of the Cold War, Europeans have slashed defense spending, eliminated weapons systems and personnel, and redesigned their militaries for low-intensity expeditionary missions not high-intensity Great Power conflict. The funds promised post-Russian invasion are insufficient to simultaneously replenish the arsenals emptied to support Ukraine, restore capabilities sidelined or eliminated after the end of the Cold War, and bulk up European militaries to withstand the material costs of high-intensity wars. Under these budgetary constraints, European states can and have turned to multinational armaments cooperation in the hope of producing weapons systems at scale – efficiently and affordably.

Before going further, I offer some definitions here. At its simplest, arms cooperation involves several states collaborating to acquire a new weapons system or capability for their militaries. Nemeth (2022) offers four models of cooperation. First, pooling of capabilities, where existing nationally owned systems are integrated into a multinational command and control (C2) structure. Second, sharing of capabilities, which resembles pooling except nations retain control over their capabilities during the collaboration. Three, role-and-task sharing sees nations use their military forces to fill other nations capability gaps – for example, other NATO allies conduct air policing missions over the Baltic states because those three states lack the necessary capabilities. Finally, this thesis focuses on co-development, one of the two types of pooling

through acquisition, the other being joint acquisition wherein states “procure, maintain, and operate a capability together.”¹ Co-development involves nations jointly researching, developing, and procuring a new capability for their militaries. Though the focus here is on co-development, joint acquisition can follow it. All four forms of cooperation interrelate: the trust and relationships built up through co-development can enable other forms of cooperation. For simplicity’s sake, this thesis uses armaments cooperation and co-development interchangeably.

SECTION 1.1: PUZZLE AND RESEARCH QUESTION

The roots of European defense cooperation reach back to the dawn of European integration amidst the wreckage of World War II.² Concurrent with the founding of the European Coal and Steel Community in the early 1950’s, France proposed a supranational European Defense Community with a European army and a common budget. This most ambitious proposal failed in 1954, rejected by the French legislature.³ Instead, exclusively European armaments cooperation – constrained by some states’ concerns of duplicating NATO’s competencies – fragmented into a cacophony of acronyms over the decades: first FINABEL, then the Western European Union (WEU)’s SAC, NATO’s Eurogroup, later the IEPG, and concluding with WEAG, later WEAO. These organizations had occasional success at cooperatively producing a

¹ Bence Nemeth, “Military Innovation and Capability Development in a Multinational Context,” *The Air Power Journal* Fall 2022 (December 2022): 6, [https://kclpure.kcl.ac.uk/portal/en/publications/military-innovation-and-capability-development-in-a-multinational-context\(f9b84ed4-cfb6-4ae1-b3dd-2f4b8163ddc7\).html](https://kclpure.kcl.ac.uk/portal/en/publications/military-innovation-and-capability-development-in-a-multinational-context(f9b84ed4-cfb6-4ae1-b3dd-2f4b8163ddc7).html).

² European defense cooperation refers to organizations with members solely on the European continent. Transatlantic defense cooperation, with members on the North American and European continent under the aegis of the North Atlantic Treaty Organization (NATO), followed a different path than exclusively European efforts. The Allies founded three armaments cooperation organizations in the early 1950’s to harmonize standards, coordinate defense planning processes, and pool logistics. Two of the three organizations survive to this day, albeit under changed names, and NATO continues to do all three tasks.

³ “Our History,” European Defense Agency, accessed May 10, 2023, <https://eda.europa.eu/our-history/our-history.html>.

weapons system, like the Tornado fighter jet, or jointly funding R&D, but none was game-changing or delivered on the promised cost-savings.

The end of the Cold War strengthened Europe's interest in integration, including in security and defense. The 1992 Treaty of Maastricht transformed the European Community into the European Union (EU) and expanded its competencies into foreign affairs by endowing it with a Common Foreign and Security Policy (CFSP). This opened the door to operational cooperation on missions to resolve crises abroad. European armaments cooperation benefited too.

Armaments organizations founded post-Cold War, like the EU's European Defense Agency (EDA) and OCCAR, received their own staff and larger budgets. These organizations have increased defense cooperation and begun to deliver on the cost-savings that premise cooperation. Unlike Cold War organizations, the EDA funds and coordinates a plethora of defense research projects, and OCCAR's management limits political haggling over workshares for its projects. However, the EDA's small budget, as well as OCCAR's narrow membership and purely intergovernmental governance, means the two organizations represent a step – not a leap – forward for armaments cooperation.

Enter the EU's European Defense Fund (EDF) and Permanent Structured Cooperation (PESCO). The EDF is the first supranationally governed armaments organization, and the first armaments organization with billions of Euros at its disposal. The European Commission decides which projects receive EU funding, allowing it to guide and promote armaments cooperation that suits European interests rather than narrower national ones. For example, PESCO's projects receive bonus funding from the EDF. That exemplifies the benefits PESCO receives from being embedded in the EU's institutional makeup, which sets it apart from most of its predecessors. Otherwise, it is the latest in a long line of intergovernmentally-governed armaments organization

that serve as a forum for states to propose cooperation. Nevertheless, these are general suppositions about the EDF and PESCO's improvements over their predecessors, the details may tell a different story. This spurred my question:

- How has past armaments cooperation affected the structures and products of the EU's current attempts at armaments cooperation?

To answer this question, this thesis proceeds in four chapters. In this first chapter, I begin with a primer on today's constellation of armaments cooperation. Then in Chapter 2, I dive into the literature on the motives and structure of armaments cooperation, before turning to my theory, historical institutionalism, for understanding the structure of PESCO and its relationships with the EDF, the Organization for Joint Armament Cooperation (OCCAR), and the European Defense Agency (EDA). In Chapter 3, I evaluate the impact of path dependency on PESCO and the EDF. By identifying similarities and differences, I determine the influence of path dependence on the current web of institutions that compose European armaments cooperation. I expect to find a middling degree of path dependency in PESCO's structure, though its relationship with the other institutions weighs against that. I also expect to see path breaking, especially in the EDF's structure. Finally, I argue based on the historical comparison, that today's armaments cooperation architecture learned from past mistakes and is more fit for success. In Chapter 4, I evaluate whether these expectations manifest. I conclude in Chapter 5 with a summation of my findings and thoughts on PESCO and the EDF's future.

SECTION 1.3: TODAY'S ALPHABET SOUP OF COOPERATION

Two organizations – PESCO and the EDF – are the main characters of this thesis. Before diving deeper, I briefly sketch their shared, short history, members, role, and relationship with my cast of supporting characters like OCCAR and the EDA. In my first analytical section on

history's impact on these organizations' structures, I will elaborate on the sketches below. I also describe two other EU mechanisms – Coordinated Annual Review on Defense (CARD) and the Capability Development Plan (CDP) – that inform PESCO and the EDF, which play a role in my second analytical section evaluating projects' success.

PESCO, the EDF, and CARD emerged from the debate initiated by the 2016 publishing of the EU Global Strategy (EUGS). The document responded, implicitly, to Brexit, Russia's initial invasion of Ukraine, and the isolationist tendencies of the then-recently elected Trump Administration, by calling for deeper defense integration.⁴ In 2017, one year after the EUGS' publishing, the EU's member states triggered PESCO, authorized and budgeted a forerunner to the EDF, and approved CARD.

When 25 of the EU's member states launched Permanent Structured Cooperation (PESCO), they committed themselves to closer cooperation and deeper differentiated integration.⁵ PESCO has two parts: 20 commitments ostensibly binding its participating member states (pMS) and its co-development projects. The commitments include the pMS raising their defense spending, harmonizing their military capabilities, improving their interoperability and readiness, and agreeing to use PESCO and EDA frameworks to overcome capability deficits. These commitments lie outside the scope of this thesis.

⁴ Olivier de France, Claudia Major, and Paola Sartori, "How to Make PeSCo a Success," *ARES Group Policy Papers*, no. 21 (September 2017): 2, <https://www.iris-france.org/notes/how-to-make-pesco-a-success/>.

⁵ Malta excused itself due to its constitutional provision for neutrality, the United Kingdom because it was in the process of exiting the EU, and Denmark because of its opt out from the EU's CSDP. After a 2022 referendum, Denmark abolished its opt out from the CSDP and it can now join PESCO, as it already has the EDA.

European Defense Agency, "Denmark joins the European Defence Agency," March 23, 2023, <https://eda.europa.eu/news-and-events/news/2023/03/23/denmark-joins-the-european-defence-agency>.

The focus here is PESCO's projects. The projects range from building new institutions, like a European Medical Command, to researching new doctrines and next-generation technologies, to developing new military capabilities, like the European Patrol Corvette (EPC). Currently, there are 60 projects, each approved by the pMS unanimously, via four different rounds of around 15 projects each over the last five years. Each pMS chooses which of the projects to join based on their military needs and political and budgetary constraints.⁶ For example, Austria participates in PESCO, yet it has not signed up to the European Patrol Corvette project – understandable given that it is landlocked. The pMS rely on the EU Military Committee (EUMC) – a Council format comprising the member states' military representatives – and PESCO's Secretariat, comprised of the European External Action Service (EEAS), the EU Military Staff (EUMS), and the EDA, to evaluate project proposals and assess their progress once approved.⁷

The EDF funds multinational research and development of defense projects. The European Commission's Directorate General for Defense Industry and Space administers the fund, and it draws from the regular EU budget to the tune of €8 billion Euros between 2021-2027.⁸ The Commission ran two programs – Preparatory Action on Defense Research (PADR) from 2017 to 2019 and the European Defense Industrial Development Program (EDIDP) from 2019 to 2020 – to pave the way for the EDF. They allowed the Commission to build-up

⁶ European External Action Service, *Permanent Structured Cooperation - PESCO*, March 23, 2023, https://www.eeas.europa.eu/eeas/permanent-structured-cooperation-pesco-factsheet-0_en.

⁷ "EUMC European Union Military Committee," European External Action Service, accessed May 11, 2023, https://www.eeas.europa.eu/eeas/eumc_en#16008;

Council Decision (CFSP) no. 2017/2315 (Establishing PESCO), December 11, 2017, OJ L 331/57, Annex III – Governance, Section 2.2.1, <http://data.europa.eu/eli/dec/2017/2315/oj>.

⁸ European Commission, Directorate-General Defense Industry and Space, *The European Defense Fund*, June 30, 2021, https://defence-industry-space.ec.europa.eu/european-defence-fund-edf_en.

institutional experience managing defense programs, test bureaucratic processes, and receive feedback from member state and industry partners.⁹ In total, PADR awarded €92 million and EDIDP €500 million.¹⁰ In comparison, the EDF handed out €1.2 billion in 2021, which gives the fund the third largest annual defense research and development (R&D) budget in the EU, behind Germany and France and greater than the *combined* R&D budgets of the other 25 member states.¹¹ Whereas PESCO focuses on the demand side of armaments cooperation, the EDF aims at the supply side: integrating Europe's fractious defense industrial base. To that end, it requires most projects it funds to involve companies from at least three countries, and it prioritizes the involvement in consortia of small- and medium-sized enterprises (SMEs). The EDF provides co-financing of up to 100 percent of the research and design costs, and up to 80 percent of the prototyping to certification costs.¹² PESCO and the EDF, like the other armaments organizations here, work closely together: the EDF provides a bonus 10 percent funding to PESCO projects.¹³

The European Defense Agency has two hats: it carries out research and technology (R&T) projects and manages co-development projects; and it collects data to facilitate defense collaboration. The EDA is an intergovernmental EU institution with decision-making made by

⁹ European Union, Court of Auditors, *The Preparatory action on defence research – Some lessons learned, but value as a testbed for increasing EU defence spending reduced due to time constraints and limited results*, April 26, 2023, <https://www.eca.europa.eu/en/publications?ref=SR-2023-10>.

¹⁰ European Commission, Directorate-General Defense Industry and Space, *European Defence Industrial Development Programme 2020*, June 30, 2021, https://defence-industry-space.ec.europa.eu/edidp-factsheet_en.

“Preparatory Action on Defence Research (PADR),” European Commission, Directorate-General Defense Industry and Space, accessed May 11, 2023, https://defence-industry-space.ec.europa.eu/eu-defence-industry/preparatory-action-defence-research-padr_en.

¹¹ EDA Defense Data 2021, accessed May 11, 2023, <https://eda.europa.eu/publications-and-data/defence-data>.

¹² European Commission, *The European Defense Fund*, 2021, 3.

¹³ European Defense Agency, *Factsheet 2022 CARD Report*, November 15, 2022, <https://eda.europa.eu/publications-and-data/factsheets/factsheet-card-report-2022>.

ministers or national armaments directors in unanimity.¹⁴ R&T includes basic and applied research occurs, whereas R&D concerns prototyping and full application. In the R&T and development role, the EDA manages dozens of research and co-development projects, including several PESCO projects handed off to the agency to implement. In the second role, the EDA analyzes pMS' militaries to identify potential areas for collaboration and acts as the EU's clearinghouse for defense data and advice.¹⁵ The EDA's two most important deliverables are the CDP and CARD. The CDP, most recently updated in 2018, identifies the capabilities the EU should develop to meet its Level of Ambition (LoA).¹⁶ The CDP contains 11 priorities broken down into 38 priority areas. In 2022 the EU's Strategic Compass defined the LoA as "maintain[ing] international peace and security," presumably, by being able to act either autonomously or in cooperation with NATO, as the preceding EU Global Strategy put it.¹⁷ After the CDP, comes CARD, which annually analyzes members' defense budgets and planning to assess their progress towards operationalizing the EU's Capability Development Priorities. Whereas the CDP identifies a laundry list of capabilities, CARD specifies a handful of the most urgently needed ones. Together these documents roughly guide PESCO and the EDF's selection

¹⁴ Council Decision (CFSP) no. 2015/1835 (Defining the Rules of the European Defense Agency), October 12, 2015, OJ L 266/55, Chapter I, Article 4, <http://data.europa.eu/eli/dec/2015/1835/oj>.

¹⁵ "Mission," European Defense Agency, accessed May 11, 2023, <https://eda.europa.eu/who-we-are/Missionandfunctions>.

¹⁶ European Defense Agency, *2018 CDP Revision: The EU Capability Development Priorities*, <https://eda.europa.eu/what-we-do/all-activities/activities-search/capability-development-plan>, 3.

¹⁷ European External Action Service, *A Strategic Compass for Security and Defense*, https://www.eeas.europa.eu/eeas/strategic-compass-security-and-defence-1_en#43556, 7.

European External Action Service, *Shared Vision, Common Action: A Global Strategy for the European Union's Foreign and Security Policy*, https://www.eeas.europa.eu/eeas/global-strategy-european-unions-foreign-and-security-policy_en, 20.

of projects, which ought to fill the gaps in EU military capabilities identified by the two documents.

OCCAR differs from the prior three organizations: it is unrelated to the EU, and it solely focuses on development and procurement of equipment. The UK, France, Germany, Italy, Belgium, Spain are members, and several other states participate in specific OCCAR programs. Unlike the EDA, OCCAR neither funds or oversees basic research, nor facilitates operational collaboration amongst its members. Nor is OCCAR a forum to politically negotiate over the requirements for a project, like PESCO. On behalf of its members, OCCAR interfaces with industry to develop, procure, and sustain lifelong military equipment that its member states own and operate. For example, rather than individually develop and procure a new frigate, France and Italy let OCCAR act on their behalf. They set the requirements for the ship and have final say over the budget and the contractor, but OCCAR solicits bids and signs contracts on their behalf with industry. OCCAR's remit covers the entire lifespan: beyond development and procurement, it signs contracts with industry for spare parts and maintenance. The goal is scale and efficiency. OCCAR manages several PESCO projects, a few of which were first handed to the EDA before moving onward to OCCAR, and it has received EDF funding too.

Each institution plays a role in the defense acquisition cycle. It begins with the CDP identifying, in the long-run, gaps in the EU's capabilities. CARD narrows in on the most urgently needed of those capabilities in the short term. Then, PESCO offers a forum for member states to respond to CARD and the CDP's identified shortfalls by proposing and negotiating the requirements of co-development projects. With requirements in hand, states can turn, for the day-to-day management of the projects, to the EDA for research-oriented projects and OCCAR for

projects aimed at the development, procurement, and sustainment of operational systems.

Regardless of which organization they choose, states can solicit funds from the European

Commission's EDF for their projects. These organizations have the potential – the competencies,

if not the resources – to integrate 27 member states' disparate equipment.

CHAPTER 2

SECTION 2.1: LITERATURE REVIEW

Armaments cooperation in Europe sits at the nexus of multiple disciplines. Some, like economics and international relations, focus on the motives for cooperation. Others, like European studies and political economy, look at the structures and means of cooperation. This thesis falls into the latter camp given its focus on explaining PESCO and the EDF's structure and the outputs of that structure. Nevertheless, I first take a detour into motives because it underlines the significance and necessity of armaments cooperation. After overviewing political, economic, and technical rationales, I turn, in my theory section, to an analysis of the organizational design of armaments cooperation.

The political motives for armaments cooperation typically derive from international relations, though European Studies has recently paid greater attention to the topic. Realists argue that the most powerful European states balance against U.S. hegemony to preserve their sovereignty, therefore they prefer collaboration at the European level. Weaker European states bandwagon with the U.S. to remain under its protection and disfavor striking out on their own through European security cooperation.¹⁸ Liberals incorporate domestic actors, arguing that states favor cooperation because their defense industrial base relies on technological cooperation and larger export markets to counteract rising costs.¹⁹ More recently, European Studies scholars

¹⁸ Alrik Thiem, "Conditions of intergovernmental armaments cooperation in Western Europe, 1996-2006," *European Political Science Review* 3, no 1 (2011): 9, doi:10.1017/S1755773910000251.

¹⁹ Antonio Calcara, *European Defence Decision-Making* (London: Routledge, 2020), 20.

have applied a neofunctionalist lens as the EU inserted itself into institutionalized arms cooperation through the EDA – founded in 2004 – and, now, PESCO and the EDF. For example, Håkansson (2021) traces the European Commission’s path from cracking down on the fragmented European defense market, to funding dual-use research, to proposing and implementing the EDF. He argued that recent EU-level collaboration results from the nearly complete integration of the single market spilling over into the traditionally exempt, fragmented defense market.²⁰ That fragmented market comes with significant inefficiencies, which the next lens – the economic one – views as the driver for arms collaboration.

From a purely economic perspective, European states must co-develop arms. With each generation of weapons systems, per unit costs rise alongside complexity as states compete to out-innovate one another and achieve a technological advantage over their opponents.²¹ Keeping up requires a near impossible balancing act between operational and personnel costs, R&D of the full spectrum of next generation systems, and producing sufficient numbers of today’s systems to achieve economies of scale.²² Few European states can do it all.²³ Only two EU member state spent over €1 billion on R&D in 2021: Germany at €1.9 billion and France at €6.5 billion. The EDF spent €1.2 billion, and the R&D budgets of the other member states combined barely surpassed €600 million.²⁴ In comparison, the U.S. spent \$105.9 billion on research, development,

²⁰ Calle Håkansson, “The European Commission’s new role in EU security and defence cooperation: the case of the European Defence Fund,” *European Security* 30, no. 4 (April 2021): 593, DOI:10.1080/09662839.2021.1906229.

²¹ Calcara, *European Defence Decision-Making*, 39.

²² Renaud Bellais, “The Economic Imperative of Europeanizing Defense Innovation,” in *The Emergence of EU Defense Research Policy*, eds. Nikolaos Karampekios, Iraklis Oikonomou, and Elias G. Carayannis (Springer, 2018), 97-99.

²³ Calcara, *European Defence Decision-Making*, 32.

²⁴ European Commission, *The European Defense Fund*, 2021;

testing, and evaluation – admittedly, a broader definition but magnitudes greater.²⁵ This speaks both to the paucity of R&D in Europe and the fragmented, inefficient manner in which its conducted.²⁶

Nor is Europe’s procurement any more efficient.²⁷ In 2021, EU member states allocated only 18 percent of their procurement spending to collaborative defense projects – far below the EU’s goal of 35 percent.²⁸ This manifests in a panoply of weapons systems, see Illustration 1, each derived from duplicative R&D and assembled in duplicative factories, each with its own learning curve for soldiers and its own logistics train.²⁹ The EDF estimated the opportunity cost of this fragmentation at between €25 and €100 billion annually.³⁰

EDA Defense Data 2021, accessed May 11, 2023, <https://eda.europa.eu/publications-and-data/defence-data>.

Excludes Denmark because of its recently abolished opt out from the CSDP, which precluded Denmark from joining the EDA and providing data. In 2022, a referendum ended Denmark’s opt out and it joined the EDA.

²⁵ United States of America, Department of Defense, *Overview – FY 2023 Defense Budget*, <https://comptroller.defense.gov/Budget-Materials/Budget2023/>, Appendix A, 2.

²⁶ Bellais, “The Economic Imperative of Europeanizing Defense Innovation,” 105.

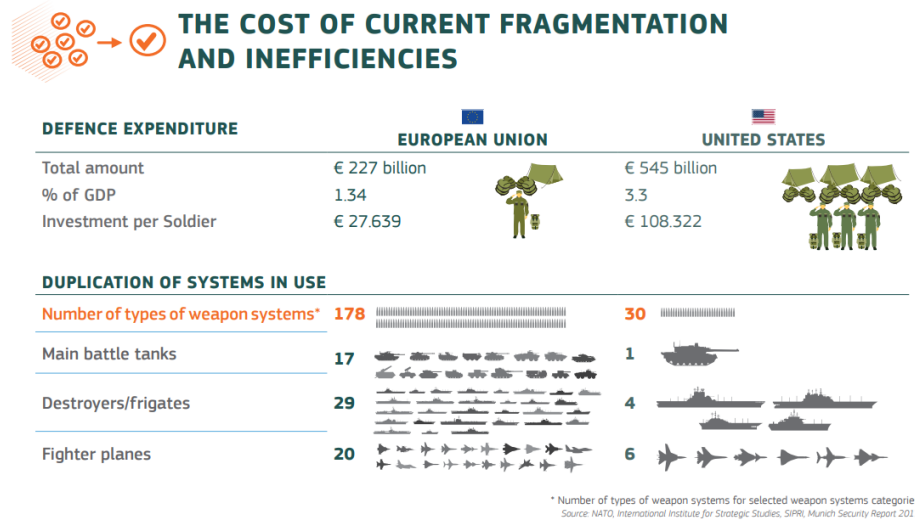
²⁷ Keith Hartley, “The Economics of European Defense Industrial Policy,” in *The Emergence of EU Defense Research Policy*, eds. Nikolaos Karampekios, Iraklis Oikonomou, and Elias G. Carayannis (Springer, 2018), 81.

²⁸ European Defense Agency, *Defense Data 2020-2021*, December 8, 2022, <https://eda.europa.eu/publications-and-data/brochures/eda-defence-data-2020-2021>.

²⁹ Bellais, “The Economic Imperative of Europeanizing Defense Innovation,” 96.

³⁰ *European Commission, The European Defense Fund*, 2021, 2.

Illustration 1 – EU Versus U.S. Weapons Systems’ Variety



Source: European Commission, The European Defense Fund, 2021.

These inefficiencies pile atop a difficult financial picture on both the demand and supply sides. In constant 2021 dollars, the current EU-27’s collective military expenditures only returned to 1990 levels in 2020. Given rising per-unit costs of systems and a broader mission set, returning to 1990 is insufficient, especially when economic growth is factored in. Since 1990, the EU-27, especially the members who joined in 2004, have gotten much wealthier – defense spending has not kept up. As a share of GDP, the EU-27’s collective military spending declined from 1990 to 2014. In the last eight years, it has risen a modest 0.3 percent to 1.64 percent of GDP in 2022, below NATO’s 2 percent goal.³¹ Russia’s expanded war of aggression against Ukraine has exposed the consequences of Europe’s defense spending austerity: arsenals are empty, equipment is ill maintained, and arms producers are struggling to scale up.

³¹ SIPRI Military Expenditure Database, accessed May 11, 2023, <https://sipri.org/databases>.

On the supply-side, the picture is similarly troubled. From 2017 onward, not a single European arms producer was among the ten largest globally, which suggests they struggle to compete between declining orders at home and tougher competitors from the U.S.³² Export data supports this conclusion: between 2001 and 2021, the value of arms exports from the EU-27 has been stagnant.³³ Poor performance in the export market and stagnant defense budgets interrelate. Limited European budgets ensure smaller production runs, higher initial per-unit costs, and fewer or more-delayed updates – downsides compared to U.S. weapons which enter the export market already enjoying economies of scale. With fewer exports, European firms struggle to develop economies of scale and learning that can spread out the costs of R&D, sustain defense technology industrial bases (DTIBs), and work against the rising per-unit costs of modern weapons systems. In other words, EU members cannot afford to go it alone on R&D or procurement, nor can their firms thrive, ironically, under member state’s protectionism.

The final motive, technical, looks to a state’s DTIB to understand the logic of cooperation. At its simplest, most, if not all, European states lack the knowledge base or skills to unilaterally research and develop the full spectrum of modern weapons. For example, most buy fighter jets off the shelf, but those with stronger DTIBs, like France, Germany, Spain, and Italy, collaborate. By collaborating, they can upskill their industry with other’s higher-level technological know-how or specialize and share the costs to overcome technological gaps.³⁴

³² SIPRI Arms Industry Database, accessed May 11, 2023, <https://sipri.org/databases>.

³³ SIPRI Arms Transfers Database, accessed May 11, 2023, <https://sipri.org/databases>.

³⁴ Christian Mölling and Torben Schütz, “European Armament Collaboration: What We Can Learn from History and Concepts,” in *The Emergence of EU Defense Research Policy*, eds. Nikolaos Karampekios, Iraklis Oikonomou, and Elias G. Carayannis (Springer, 2018), 136.

Constellations of these states produced jets like the Tornado and the Eurofighter and are developing the Future Combat Air System (FCAS).

Calcara (2017, 2020) has developed the technical argument further to explain the simultaneous presence of arms cooperation and unilateral procurement.³⁵ He argues that the governance of a state's defense industry and its domestic market size affect its propensity for armaments cooperation, as well as the shape that cooperation takes. In this theory, the defense industry is motivated by the transfer of technology inherent to capability co-development: either the downside of a partner accessing their proprietary technology and hurting their market share or the upside of accessing another firm's technology and leveling up. A firm's ability to act on this concern depends upon their relationship to the state. In a state where the defense industry was once nationalized and the state retains significant influence over it, firms can more clearly share their preferences with the state. Therefore, the closer the relationship between the defense industry and the state, the likelier that the state prefers cooperation with clear technological benefits for its firms. A state with a privately owned defense industry and fewer state-industry ties has more room to prioritize cooperation with macroeconomic and political benefits. The smaller the domestic market, then the less technologically advanced or more specialized a firm is thus they are likelier to support cooperation to end up on the receiving end of a technology transfer.³⁶ Calcara's approach blends domestic and international actors, which sets it apart from the single-level international relations or European integration explanations for state's preference

³⁵ Antonio Calcara, "State–defence industry relations in the European context: French and UK interactions with the European Defence Agency," *European Security*, 26, no. 4 (October 2017): 527-551, <https://doi.org/10.1080/09662839.2017.1384379>.

Calcara, *European Defence Decision-Making*, 30.

³⁶ Calcara, *European Defence Decision-Making*, 36.

for armaments cooperation. The unifying element of these motives-centered approaches is their focus on the state, whether its domestic politics and economy or its geopolitical standing and stance. Once states have determined, out of whatever combination of the above factors, that they want to cooperate, then attention turns to how, to what structure best serves their interest.

SECTION 2.2: THEORY

This thesis builds on Marc DeVore (2012)'s chronology of 60 years of Europeans arms cooperation.³⁷ For the first half of my analysis I adopt his theory and methods and extend them to developments in the decade since he published his history. I use historical institutionalism as my framework because it conveys how the past continues to constrain today's organizational design choices resulting in inefficient, heterogenous architectures.³⁸ That aptly describes modern European armaments organizations too between the EDF, the EDA, PESCO, and OCCAR.

Path dependency, the constraints of past decision making, exerts itself in three ways. First, states lock themselves into existing organizational arrangements by adapting their policymaking to incorporate that current set up and setting a high bar for organizational change to prevent later disadvantageous changes by rival states. Second, organizations grow more efficient with age as their bureaucracy's learn and processes improve, which disfavors replacing the organization with a new one without a comparable store of institutional knowledge.³⁹ Finally, organizations have high set-up costs both in terms of the lengthy bargaining to create them, and

³⁷ Marc R. DeVore, "Organizing international armaments cooperation: institutional design and path dependencies in Europe," *European Security*, 21, no. 3 (May 2012): 432-458, DOI:10.1080/09662839.2012.667806.

³⁸ *Ibid.*, 7.

³⁹ Anand Menon, "Power, Institutions and the CSDP: The Promise of Institutional Theory," *Journal of Common Market Studies* 49, no. 1 (December 2012): 87, <https://doi.org/10.1111/j.1468-5965.2010.02130.x>.

the headquarters, staff, and budget to operate them. A mixture of these factors helps explain organizational outcomes.

Four outcomes roughly describe organizations' futures. The outcomes proceed from least to greatest influence of path dependency. First, states can eliminate and replace obsolescent organizations. This implies either limited to nonexistent path dependency, or the arrival at a critical juncture. A critical juncture is an exogenous shock that challenges preconceived notions of the range of acceptable policy outcomes, enabling states to deviate from the existing path that seemed self-evident prior to the crisis. Given the high political and technical costs to standing-up a new organization and the loss of bureaucratic knowledge from eliminating the old one, the presence of a critical juncture that shocks states into overcoming these costs better explains the elimination and replacement of organizations than looking to ahistorical rationales. Second, states can layer a new organization atop the old. Layering retains institutional knowledge but entails comparable political and technical set-up costs as outcome one. Third, states can convert parts of an organization to new purposes. This lessens set-up costs and the loss of institutional knowledge. However, conversion incurs political costs from states' incorporating new decision-making pathways into their policy making, as well as from building the necessary consensus amongst member states for organizational change. Whereas replacement turns the path in a new direction, conversion and layering retain original elements of the organization and, thus, imply middling path dependency. Fourth, organizations can grow over time within their path dependent constraints. The higher the costs of setting-up or converting an organization and the greater the institutional knowledge built-up, then the likelier it is for an organization to fall into the positive feedback loop of path dependency regardless of its suitability for meeting current challenges or

its inefficiencies. Each of these outcomes has occurred in the 70 years of development in European armaments cooperation.

Layering and building relationships between armaments organizations are not new outcomes or phenomena, but the relationship between organizations in today's architecture is better institutionalized than before. As noted in my background section, projects initiated by one organization, like PESCO, can and have been subsequently handed over to other organizations, who, in turn, have passed those projects on to other organizations. This reflects each organization recognizing its capabilities and specializing within its role. Agreements between the organizations enable and encourage this cooperation, and PESCO's founding document explicitly calls for member states to utilize other armaments organizations to manage projects. Resulting from this improved institutionalization, today's set of European armaments organizations are greater than the sum of their parts such that they form what I deem a web of cooperation.

SECTION 2.3: METHODOLOGY

SUBSECTION 2.3.1: HISTORY'S IMPACT ON TODAY'S ORGANIZATIONAL DESIGN

To trace organizational evolution and replacement, DeVore (2012) tracks four features of organizational design: mandate, membership, representation, and resources. Mandate refers to the task(s) for which an organization is responsible. This comprises general R&D, standard setting for interoperability, integration and regulation of defense industries, co-development of weapons, and pooling of systems. Membership is seemingly self-explanatory, though I expand membership from merely a list of states, to include the formal relationships between armaments organizations as a form of membership. Depending on the project and the organizations, one

organization can have voting rights in another organization. Representation concerns who – industry, politicians, national civil servants, military officers, international bureaucrats – has a seat at the table. Finally, under resources are the organization’s staff and budget.

Relying on these four features, I describe and compare in Chapter 3 PESCO and the EDF to their older colleagues, the EDA and OCCAR. I rely on the Council decisions governing PESCO, the EDA, and the EDF, as well as OCCAR’s founding treaty, to outline organizational structures. When applicable, I compare PESCO and the EDF to older, long-defunct armaments organizations too, like the IEPG. For older organizations, I rely on DeVore 2012’s sketches of each organization. By identifying similarities and differences, I determine the influence of path dependency on the current web of institutions that compose European armaments cooperation. I expect to find a middling degree of path dependency in PESCO’s structure, though its relationship with the other institutions weighs against that. I also expect to see path breaking, especially in the EDF’s structure. Bridging the gap between Chapters 3 and 4, I argue based on that historical comparison, that today’s armaments cooperation architecture improves upon earlier iterations.

Previewing my bridging argument, I view improvement three ways: relevance, progress, and increased cooperation. First, already agreed upon European-level strategies guide PESCO and the EDF. Past European armaments organizations, excluding transatlantic ones, lacked documents like the CDP, CARD, and the Strategic Compass. While national priorities remain relevant, these documents layer shared European priorities atop them. The EDA’s multiple roles – writing these documents, managing its own R&T projects, and staffing PESCO’s secretariat, where it evaluates project proposals – adds an additional linkage between participating member states, PESCO’s projects and European priorities. Therefore, PESCO and the EDF’s projects

should refer to those priorities in addition to national ones. Second, the EDF's bonus for PESCO projects comes with strings attached, namely, transparency requirements and accountability to the Commission. This increases the likelihood of pMS following through on their PESCO projects, and delivering them on-time, rather than leaving them empty promises made for political gains. Third, agreed upon European priorities and competitively awarded financial incentives each tackle one of cooperation's usual stumbling blocks: conflicting national priorities and haggling over workshares. If my initial two expectations manifest, then they ought to lower the hurdles to cooperation and stimulate additional cooperation. Familiarization with PESCO's processes, deepening relationships between pMS' ministries of defense, and the normalization of cooperation should bolster the positive feedback loop of easier cooperation begetting more cooperation.

SUBSECTION 2.3.2: COMPARING HISTORICAL EXPECTATIONS TO REALITY

In the second half of my analysis, I compare the expected benefits derived from my historical comparison to the reality of PESCO and the EDF. This shifts my focus from the organizational level to that of the individual projects. To do so, I operationalize here the three metrics of success above – relevance, progress, and further cooperation.

Relevance has two subcomponents: comprehensiveness and ambitiousness. For comprehensiveness, I match each PESCO project and EDF project to one of the CDP's 38 priority areas, which each fall under one of 11 priorities. I borrow this methodology from a 2019 IISS report, which applied it to the initial two rounds of PESCO. I rely on their classifications for those two rounds but make my own judgements for rounds three to five, as well as for the EU-

funded projects.⁴⁰ I include all five rounds of PESCO projects, 72 in total, as well as the 163 projects from PADR, the EDIDP, and the EDF's 2021 and 2022 work programs. For the full cross-reference of PESCO's projects against the priority areas, see Appendix 2, Table 3 and, for EU-funded projects, see Table 4. Not all projects correspond to a priority area, and projects can and do touch upon multiple priority areas. Note, when the EDF funds a PESCO project, it does not allocate the money directly to the project. Instead, it allocates funds to the winning industry consortium's project, which the EDF, in its project factsheet, associates with a PESCO project.⁴¹ Some PESCO projects have one or more associated EDF projects; I note this in Table 4 by italicizing the EDF projects' title and including the PESCO project's title in brackets.

While cross-referencing against the CDP establishes the organizations' comprehensiveness, it says nothing of their ambitiousness. For that, I turn to the EU's 2020 and 2022 CARD reports, which identify a handful of collaborative opportunities that are "most-promising, most-pressing, and most-needed."⁴² For each opportunity, I identify PESCO and EDF projects that meet it, as well as establish the projects' track record as a case study of its ambitions.

Besides testing my historically derived expectations, matching projects addresses a gap in the public record. PESCO factsheets, as well as the Council's conclusions on PESCO progress reports tout the overall number of CDP priority areas with matching PESCO projects but fail to break that data down by area or by project round. EDF project factsheets also fail to link projects

⁴⁰ Alice Billion-Galland and Yvonne-Stefania Efstathiou, *Are PESCO Projects Fit for Purpose?*, (European Leadership Network and IISS, February 2019): 6, <https://www.europeanleadershipnetwork.org/policy-brief/are-pesco-projects-fit-for-purpose/>.

⁴¹ An associated project's consortium does not necessarily align with the PESCO project's pMS.

⁴² European Defense Agency, *2022 Coordinated Annual Review on Defence Report*, November 2022, [https://eda.europa.eu/what-we-do/EU-defence-initiatives/coordinated-annual-review-on-defence-\(card\)](https://eda.europa.eu/what-we-do/EU-defence-initiatives/coordinated-annual-review-on-defence-(card)), 8.

to specific CDP priority areas. Without more specific data, a comprehensive understanding of how PESCO and the EDF's ambitions have evolved and where they continue to fall short is impossible. Nevertheless, this approach has downsides. Unlike NATO's planning process, the EU's CDP lacks an agreed upon force structure to build towards and it was last updated in 2018.⁴³ Nevertheless, the Commission refers to the CDP when selecting EDF projects, and PESCO urges pMS to incorporate the CDP when initiating projects.

For progress, I exclude the EDF's projects, as well as PESCO's fifth round projects. The fifth round launched in May 2023 - too close to this thesis' publication to generate results. I exclude the EDF because it is my primary source for evidence of PESCO projects' progress towards delivering on their promises. Whereas EDF projects have budgets, timelines, expected deliverables, and an industry consortium, PESCO projects have a title, description, and list of pMS – see Illustration 2. Whereas EDF projects face Commission oversight and transparent expectations, PESCO projects can and have languished in anonymity and stagnated. PESCO's annual progress reports and its 2020 Strategic Review are confidential; only the Council's recommendations based on the documents are public. Except for the Council's Response to the Strategic Review, the Council avoids mentioning projects by name. The Review listed a subset of projects from rounds one to three that it expected to produce results by 2025, though it and subsequent reports warned that other projects had stagnated or failed to deliver results. This

⁴³ Max Bergmann and Otto Svendsen, *Transforming European Defense: A New Focus on Integration*, (CSIS, June 15, 2023): 41, <https://www.csis.org/analysis/transforming-european-defense-new-focus-integration>.

Council and Parliament Regulation no. 2021/697 (establishing the European Defence Fund), April 29, 2021, OJ L 170/149, Preamble, Section 58, <http://data.europa.eu/eli/reg/2021/697/oj>.

Council Decision (CFSP) CFSP no. 2017/2315 (Establishing PESCO), Annex II – List of Ambitious and More Binding Common Commitments in The Five Areas set out by Article 2 of Protocol No 10, Article 15.

section of my analysis, besides evaluating the expectations derived from my historical comparison, attempts to shed light on the reality of PESCO projects.

Illustration 1 – Top: EDF project factsheet excluding the list of firms in the industrial consortium; Bottom: PESCO project webpage.

ALTISS
Highly Automated Swarm of Affordable ISR Long Endurance UAVs for force protection

SELECTED PROJECTS EUROPEAN DEFENCE FUND (EDF) 2021

CALL TITLE:	Open call dedicated to SMEs for development of innovative and future-oriented defence solutions
TOPIC TITLE:	Development of innovative and future-oriented defence solutions
DURATION OF THE PROJECT:	36 months
TYPE(S) OF ACTIVITIES:	Studies; Design; Prototyping; Testing
ESTIMATED TOTAL COST:	€ 3,860,321.98
MAXIMUM EU CONTRIBUTION :	€ 3,202,501.08

SHORT DESCRIPTION OF THE PROJECT:
ALTISS will provide improved ISR (Intelligence, Surveillance and Reconnaissance) capacity through an affordable resilient UAVs (Unmanned Air Vehicle) swarm.

The project “Highly Automated Swarm of Affordable ISR Long Endurance UAVs for force protection” (ALTISS) will be based on innovative solutions for communication and flight management, enhanced image processing algorithms for light UAV and automated event detection, and enhanced SIGINT (Signal Intelligence) sensors to detect and localise radio emitters and merge info with image processing to improve the identification of targets. It is an innovative solution that will improve force protection while decreasing collateral damages and logistic footprint.

PESCO PROJECTS
EUROPEAN MILITARY SPACE SURVEILLANCE AWARENESS NETWORK (EU-SSA-N)

Coordinator 
Project Members 

The main scope of this project is to develop an autonomous, sovereign EU military SSA capability that is interoperable, integrated and harmonized with the EU-SST Framework Initiative for the protection of European MS Space assets and services. It will also enable appropriate response to natural and manmade threats.

Sources: European Defense Fund, ALTISS; “EU-SSA-N,” PESCO, European Union.

I rely on a wide array of sources to find evidence of projects’ making progress towards their goals. Projects funded by the EU and/or managed by EDA/OCCAR have factsheets and, often, project websites. For projects without support from the EDF’s 2021 or 2022 work programs, I turn to the 2022 and 2023 EDF’s Indicative Multiannual Perspective Documents; if a project is listed as a “main expected outcome,” I classify it as EU-funded. PESCO projects

without associated EU-funded projects or EDA/OCCAR management have fewer sources. I rely on news articles and press releases from industry and the defense ministries of the coordinating member state. To gather the material, I go through two steps. First, I search for the project's full title, its acronym, and snippets of its title in English and in the coordinating member state's language, using the Council's translations of each project. Second, I repeat the process using Google's site search tool on the websites of the coordinating member state's defense ministry and the EDA. In sum, using open-source research I have constructed as comprehensive a database of PESCO projects' track record as possible.

To test my expectation that EU-funded projects demonstrate more progress than those without EU-funds, I construct a typology of projects' outcomes, see Figure 1. For 21 of the 61 projects evaluated, I have self-reported expected delivery dates against which I can compare their progress. First, A 2019 IISS report sent questionnaires or conducted substitute interviews with project spokespeople to determine a delivery date for each of the 34 projects from the initial two rounds.⁴⁴ Their survey period ran only two months after the launch of the second round of projects and 10 months after the first; the expected delivery dates reported by project coordinators were preliminary. Second, the 2020 PESCO Strategic Review lists projects from rounds one to three that it expected to deliver results by 2025.⁴⁵ For the 21 projects that appeared in one or both of the lists, I categorize them as on-time when they are meeting their earliest reported deadline, and as progressing if they are delayed from an earlier IISS date to the Strategic Review's 2025 deadline.

⁴⁴ Lucie Béraud-Sudreau, Yvonne-Stefania Efstathiou, and Conor Hannigan, *Keeping the momentum in European defence collaboration: an early assessment of PESCO implementation*, (IISS, May 2019): 3, <https://www.iiss.org/blogs/research-paper/2019/05/pesco>.

⁴⁵ *Ibid.*, 6.

For projects delayed beyond the Strategic Review and for projects excluded from the IISS report and the Strategic Review, which includes the entire fourth round, I categorize them based on the recentness of the evidence. If the latest evidence of a project was published before January 2022 – one and a half years ago, and only three months after the launch of the fourth round – I consider the project stagnant. If the latest mention of a project was published after January 2022, I either categorize the project as unclear or progressing. Unclear covers projects with no EU funding and one or two pieces of evidence published pre-January 2023. Progressing covers EU-funded and/or EDA/OCCAR-supported projects without a reported deadline, and projects without EU funds but with evidence published in 2023. The final two categories, and the easiest to establish, are closed and operational projects – two statuses that PESCO itself notes. For an overview of the typology, see Figure 1, **bolded** are the project outcomes.

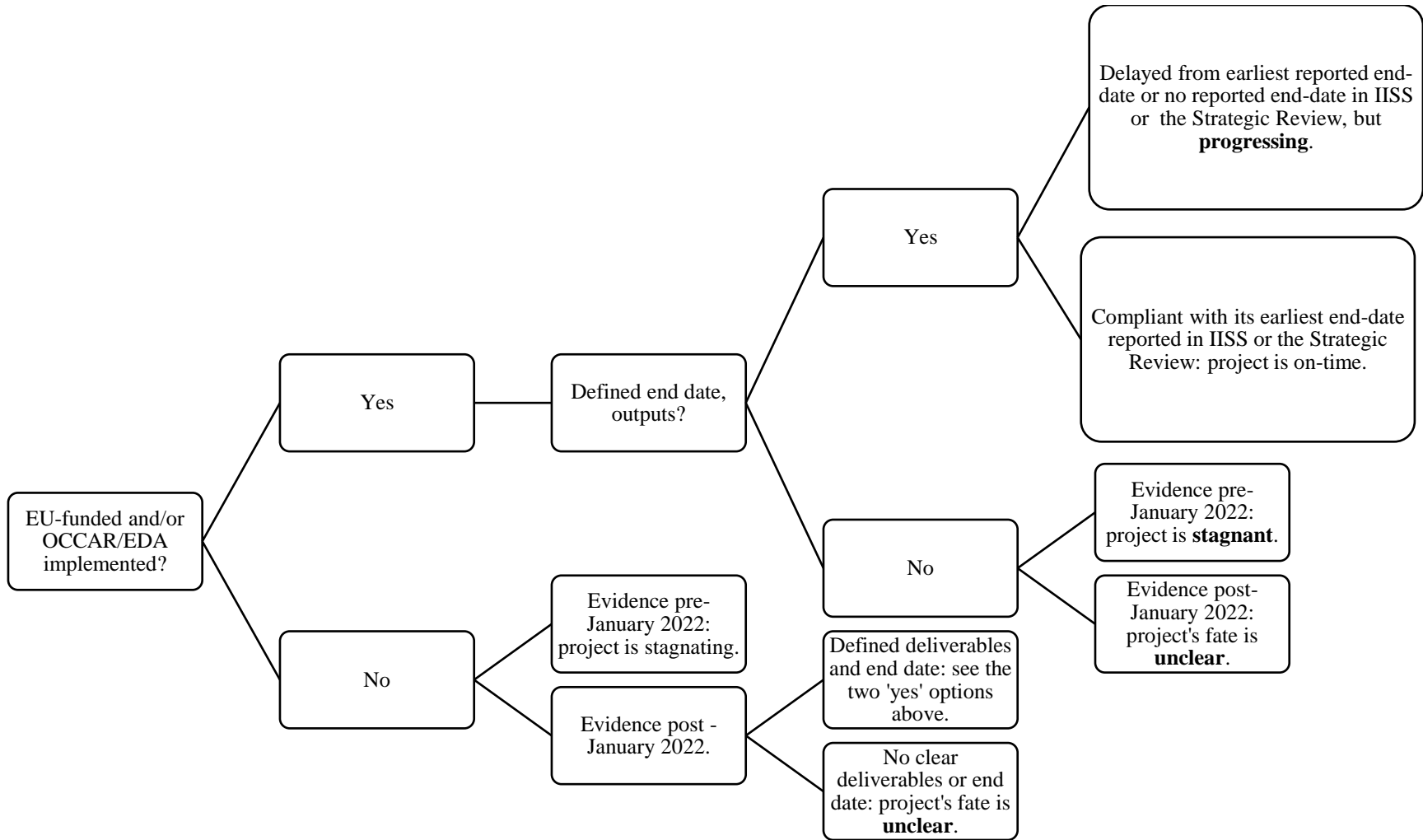
This approach is imperfect, but better than the alternatives. It assumes that participants in a project wish to publicize their contributions to tout their business successes or their contributions to European security. My approach excludes national budget documents given the difficulty of sifting through and translating 26 states' defense budgets for individual budget line items. Nor do I repeat IISS' survey of project coordinators given the unlikelihood of receiving an answer. Though my open-source approach may have overlooked evidence of progress – whether out of participants' desire for secrecy or oversight on my part – it is better than the aforementioned alternatives given the space and time constraints of this thesis, as well as the inaccessibility of source materials.

For evidence of deepened cooperation, I exclude the usual consideration of budgets. The EDA documents the share of EU member state's defense spending devoted to collaboration, but the agency only breaks the data down into expenditures on collaborative equipment procurement

and collaborative R&T. The EDA does not break collaborative equipment procurement down into its components: collaborative R&D and joint procurement (via OCCAR, for example). No PESCO's project has reached the procurement stage yet, therefore the data lacks sufficient granularity to evaluate my expectation.

Instead, I turn to three other metrics of deepened cooperation. Relying on the database of projects' progress constructed for my prior criteria, I evaluate the relationship between each of the organizations – OCCAR, EDA, PESCO, and EDF – in what I call the web of cooperation between armaments cooperation. Close cooperation among these organizations is necessary for either of my prior two criteria – relevance and progress – to manifest. In turn, the greater the relevance of cooperative projects and the greater the evidence that projects deliver, then the incentive grows for states to continue cooperating and reap the benefits. I evaluate two relationships between these organizations. First, I evaluate PESCO's relationship to the EDF to determine how EU funding has changed over time. Second, I consider whether OCCAR and the EDA are managing or supporting more PESCO projects over time to discern the degree to which pMS believe OCCAR and EDA to be reliable overseers of projects. Finally, I track the number of participants in PESCO's projects over time to assess the staying power of cooperation: are projects' momentary political statements or durable means to deepen relationships between member states?

Figure 1 – Typology of Projects’ Progress



Source: Author’s own compilation.

CHAPTER 3: PATH DEPENDENCY AND THE EU'S ARMAMENTS COOPERATION

SECTION 3.1: BRIEF HISTORY OF EUROPEAN ARMAMENTS COOPERATION

For simplicity's sake, DeVore (2012) breaks the history of European armaments cooperation into three phrases. The first phase runs from the original armaments organization's founding in 1949 until the mid-1960s, after which states launched no new transatlantic organizations. The second phase covers the latter half of the Cold War until 1991, and the third phase runs from 1991 to the present. I begin by briefly overviewing the common organizational design traits of each phase. Then, I go through each of DeVore's four organizational design traits – mandate, members, representation, and resources – and compare the EDF and PESCO to my brief history, with an emphasis on comparisons to OCCAR, the EDA, and the IEPG.

By the end of the first phase, five armaments organizations existed. Three transatlantic ones under NATO and two solely European ones – the NATO ones dealt with joint logistics, harmonization of standards, and collaborative procurement. The success of the former two NATO organizations – they remain alive, albeit with evolved names and mandates, today – has shifted the path of European armaments cooperation away logistics and standardization.⁴⁶ All five organizations had expert military and civil servant representatives making decisions. For the lower stakes deals made in the logistics and standards setting organizations, this decision-making method posed little issue. For co-development, multinational technocracy tended to produce projects that more closely and cost-effectively met the military's requirements, but at the expense

⁴⁶ DeVore, "Organizing international armaments cooperation," 446.

of elected officials and domestic industry's political calculations and protectionist instincts. This led to projects collapsing when politicians reneged on deals to collaborate, that they perceived as disadvantageous to their domestic defense industry.⁴⁷ The organizational design of the second phase corrected for that imbalance in representation.

Second-phase organizations were exclusively European, and they focused on co-development. NATO left that niche empty, after its transatlantic co-development body collapsed in the mid-1960s as the U.S. grew more protectionist.⁴⁸ The primary armaments organization of this era, the Independent European Program Group (IEPG), was merely a forum for ministers and national armaments directors to negotiate terms of ad-hoc co-development projects.⁴⁹ It only received a permanent staff of five in 1989, 13 years after its founding, when its members expanded its mandate to cooperative research and technology projects.⁵⁰ The primacy of elected officials addressed states' commitment issues to co-development, but political haggling weighed on the promised efficiency and cost-savings of collaboration.⁵¹

Whereas first-phase organizations relied on competitive procurement, *juste retour* ruled the second phase. *Juste retour* "guarantees that a national defence industry must receive work worth the full amount of its government's financial contribution," which creates perverse incentives that hinder cooperation's promised efficiency gains and cost savings.⁵² Rather than

⁴⁷ DeVore, "Organizing international armaments cooperation," 440-445.

⁴⁸ *Ibid.*, 444.

⁴⁹ Marc R DeVore, "Producing European armaments: Policymaking preferences and processes," *Cooperation and Conflict* 49, no.4 (March 2014): 451, <https://doi.org/10.1177/0010836714525052>.

⁵⁰ DeVore, "Organizing international armaments cooperation," 446.

⁵¹ *Ibid.*, 445.

⁵² Calcara, *European Defence Decision-Making*, 9.

allocating work on merit, juste retour incentivizes politicians, pushed by their defense industries, to allocate work such that their domestic firms profit from technology transfer.⁵³ DeVore (2014) cites the example of the British-German-Italian Tornado fighter aircraft's wing pivot system. A British firm had experience building them and a German firm none, but political haggling over workshares ensured the German firm received the contract.⁵⁴ The profligacy and waste of the second phase greased the wheels of cooperation and delivered results but proved unsustainable amidst the declining defense budgets after the end of the Cold War.

The defining characteristic of DeVore's third phase – running from 1990 to the present – is the rise of international bureaucracies. OCCAR, founded in 1996, and the EDA, founded in 2004, exemplify this characteristic. As of 2023, OCCAR oversees 22 armaments programs, manages a budget of €6 billion, and has nine offices across its six member states.⁵⁵ In 2022, The EDA managed 97 projects, had 171 staffers, and a budget of €151 million (to partially fund projects, with the difference paid by pMS).⁵⁶ One of these organizations alone has orders of magnitude more resources than the IEPG, and, unlike the IEPG, these organizations' permanent bureaucracies are actors in their own right. The EDA's mandate evinces these bureaucracies' interest in increasing cooperation. The agency identifies areas of possible cooperation, sets voluntary spending targets for member states, and collates their defense spending.⁵⁷ Given post-Cold War declines in defense budgets, third phase organizations rejected the profligacy of earlier

⁵³ Ibid., 18.

⁵⁴ DeVore, "Producing European armaments," 450.

⁵⁵ OCCAR, *OCCAR Business Plan 2023*, February 2023, <https://www.occar.int/occar-business-plan>, 55.

⁵⁶ European Defense Agency, *Annual Report 2022*, May 8, 2023, <https://eda.europa.eu/publications-and-data/all-publications/annual-report-2022>, 27.

⁵⁷ Mölling and Schütz, "European Armament Collaboration: What We Can Learn," 142.

projects by renouncing juste retour in favor of competitive procurement. Nevertheless, these organizations evolved path-dependently from second-phase organizations and their intergovernmental control structure reflects that. Like second-phase organizations, ministers of defense or their representatives decide their budget and which projects to pursue under the EDA's or OCCAR's aegis. This brings me to the question that animates this first half of my analysis: to what degree are PESCO and the EDF evolutions of second and third phase organizations – or do they break from the path?

SECTION 3.2: MANDATE

The mandates of both PESCO and the EDF resemble and improve upon the specificity of earlier organization's missions. Neither organization's mandate breaks from the path set by the IEPG, OCCAR, and the EDA; they avoid trampling on NATO's competencies around standards setting and providing logistics support.⁵⁸ Beginning with PESCO, it echoes the EDA's unchanged 2004 mission. Whereas the agency's mandate reads, to "improve the Union's defence capabilities in the field of crisis management and to sustain the" Common Security and Defense Policy (CSDP) now and in its future evolution, PESCO's states that it seeks to "improve [member state's] respective military assets and defence capabilities through well-coordinated initiatives and concrete projects."⁵⁹ In the thirteen years separating these two mission statements,

⁵⁸ In 2007, the EDA expanded its remit into standards setting with the launch of a database of standards, justifying it on defense industrial grounds that it is a means to "to consolidate the highly fragmented defence materiel market in Europe." Beginning in 2015, in cooperation with other actors, the EDA expanded further to developing new standards. The line here with NATO has blurred over the years.

"European Defence Standardization," European Defense Agency, accessed May 12, 2023, <https://eda.europa.eu/what-we-do/all-activities/activities-search/materiel-standardisation>.

⁵⁹ Council Decision (CFSP) no. 2015/1835 (Defining the Rules of the European Defense Agency), Chapter I, Article 2.

Council Decision CFSP) no. 2017/2315 (Establishing PESCO), Annex 1 - PESCO Principles.

the EU's geopolitical ambitions rose, which PESCO's specification of means to its ends and dropping of the 'crisis management' caveat evince. PESCO's mission statement envisions a wider focus for the EU's CSDP. The core remains the same: improving defense capabilities.

Unlike PESCO and the EDA's military framing, the EDF and OCCAR approach the problem from an economics lens. OCCAR's original and unchanged 1996 mission states that OCCAR enables "a strengthening of the competitiveness of [the] European defence technological and the industrial base" by renouncing juste retour in the management of cooperative programs.⁶⁰ Whereas OCCAR sets a broad objective, the EDF details that it seeks to enhance "the competitiveness, innovation, efficiency and technological autonomy of the Union's defence industry."⁶¹ The changed emphasis reflects several factors. First, the EDF follows standard EU budgeting principles that ban the practice of juste retour, making it a nonmatter.⁶² Second, OCCAR's mission, written in 1996, reflects that decade's dearth of systemic rivalry and collapsing defense budgets. Only competitive-enough defense firms would survive austerity. This ruthless attitude was prevalent: in 1993, the U.S. Department of Defense warned its leading defense contractors of austerity ahead and urged mergers – twelve contractors became four by the end of the decade.⁶³ The EDF's addition of 'innovation, efficiency and technological autonomy' responds to the return of systemic rivalry with China and Russia and the growing military importance of new, revolutionary technologies. In both PESCO and the EDF's case,

⁶⁰ Convention on the Establishment of the Organisation for Joint Armament Cooperation, UK-FR-GE-IT, Chapter 2, Article 5, <https://www.occar.int/occar-rules>.

⁶¹ Council and Parliament Regulation no. 2021/697 (establishing the European Defence Fund), Preamble, Section 4.

⁶² *Ibid.*, Preamble, Sections 54, 55.

⁶³ John Mintz, "How a Dinner Led to a Feeding Frenzy," *Washington Post*, July 4, 1997, <https://www.washingtonpost.com/archive/business/1997/07/04/how-a-dinner-led-to-a-feeding-frenzy/13961ba2-5908-4992-8335-c3c087cdebc6/>.

their mandates layered new emphases atop their older siblings' mission statements, evolving path dependently.

SECTION 3.3: MEMBERS

Beginning with OCCAR, mandate grows more nuanced than a binary between member and non-member states because organizations began allowing third party participation in projects.⁶⁴ Whereas the Cold War era IEPG included all 13 Western European NATO members, OCCAR only has six member states.⁶⁵ However, far more than six states participate in OCCAR projects because OCCAR has developed with nonmembers a hierarchy of relationships, which range, in descending degree of decision-making power, from member states, to non-member state participants in select projects, to observers.⁶⁶

The EDA, and later PESCO, followed OCCAR's lead in pursuing differentiated integration, i.e., allowing states to pick and choose from a buffet of forms of cooperation.⁶⁷

⁶⁴ Convention on the Establishment of the Organisation for Joint Armament Cooperation, Chapter 10, Article 38.

OCCAR goes so far as to allow non-European firms to receive work when their state participates in an OCCAR-managed program. Australia signed an agreement with OCCAR governing its participation, for which this was one of the rationales.

Framework Agreement between the Government of Australia and the Organisation for Joint Armament Cooperation (Organisation Conjointe de Coopération en Matière d'Armement (OCCAR)) for the Participation of Australia in OCCAR-Managed Programmes, OCCAR-AUSTRALIA, Article 6, <http://www.austlii.edu.au/au/other/dfat/nia/2021/19.html>.

Council and Parliament Regulation no. 2021/697 (establishing the European Defence Fund), Article 9.

⁶⁵ Ron Matthews, "European Collaboration in the Development of New Weapon Systems," in *The Emergence of EU Defense Research Policy*, eds. Nikolaos Karampekios, Iraklis Oikonomou, and Elias G. Carayannis (Springer, 2018), 116.

⁶⁶ OCCAR, Executive Administration, *OCCAR Management Procedure 3 Annex A Observer Status Issue 3*, April 2014, Article 1, <https://www.occar.int/occar-rules>;

OCCAR, Executive Administration, *OCCAR Management Procedure 2 Programme Integration Issue 7*, July 2016, Article 1, <https://www.occar.int/occar-rules>.

⁶⁷ Council Decision (CFSP) no. 2015/1835 (Defining the Rules of the European Defense Agency), Chapter VI, Article 26.

PESCO's process for third-state participation in its co-development projects builds on existing EDA procedures by requiring invited third-states to sign with the EDA an administrative agreement governing their defense cooperation with the EU. The EDA has signed administrative agreements with five states, all European except the U.S (in 2023) – the first new institutionalization of transatlantic armaments cooperation since the 1960's.⁶⁸ Third states have only joined two PESCO projects.⁶⁹ Neither are capability oriented, rather they are operational in nature. For example, Military Mobility aims to cut through red tape slowing the movement of military personnel and assets within the EU.⁷⁰ Third state participation grants a varying degree of decision-making power within projects, depending upon the organization, but the full members retain final say over the organization writ large. By building layers of participation, today's armaments organizations retain the adaptability of the IEPG's blank-canvas, discussion forum format at the organizational level, while at the project-level enjoying the benefits of years of institutional knowledge. As with its mandate, PESCO's nuanced membership follows the examples of its predecessors from the turn of the century.

The EDF does not quite fit the usual conception of membership, given that firms, not member states, participate in EU-funded projects. Indirectly, the EDF's members are the states whose firms are eligible to work on EU-funded projects, i.e., the EU-27 plus Norway.⁷¹ The fund

⁶⁸ European Defense Agency, "EDA–U.S. Department of Defense Administrative Arrangement Signed," April 26, 2023, <https://eda.europa.eu/news-and-events/news/2023/04/26/new-pillar-for-cooperation-eda-u.s.-department-of-defense-administrative-arrangement-signed>.

⁶⁹ They are Military Mobility and NetLogHubs.

European External Action Service, "Questions & Answers: Third States' participation in PESCO projects," May 23, 2023, https://www.eeas.europa.eu/eeas/questions-answers-third-states%E2%80%99-participation-pesco-projects_en.

⁷⁰ "Military Mobility," PESCO, European Union, accessed May 13, 2023, <https://www.pesco.europa.eu/project/military-mobility/>.

⁷¹ Council and Parliament Regulation no. 2021/697 (establishing the European Defence Fund), Article 9.

further complicates the concept of membership, when projects implemented by the EDA or OCCAR receive EU funding. That requires the Commission to sign an agreement with the managing organization and it grants the Commission a say in the project's management, alongside the participating member states. That is unprecedented. The EDA and OCCAR's staff may advise pMS on a project or provide administrative support, but only if the pMS invite them and both organizations remain intergovernmentally run. This is the first instance of supranational bureaucrats having a voice in armaments organizations, which brings me to my third design trait, representation.

SECTION 3.4: REPRESENTATION

Representation in PESCO's decision making follows earlier examples, whether at the organizational or project-level. Beginning at the organizational level, member state representatives make decisions.⁷² The same format applies to the EDA too, though, whereas various formats of the Council govern PESCO, the EDA symbolically sets aside their nomenclature in favor of a steering board.⁷³ Otherwise, the participants – defense ministers, national armaments directors, and their delegated representatives – remain the same in either format. PESCO's voting procedures are a throwback to an earlier era. Except when adopting budgets, the EDA decides via qualified majority voting, though, if a member states objects to QMV then no vote will be held.⁷⁴ OCCAR too has backdoor unanimity, allowing for qualified

⁷² Council Decision (CFSP) no. 2017/2315 (Establishing PESCO), Article 4, Section 1.

⁷³ For example, the Political and Security Committee (PSC), the Politico-Military Group (PMG), and the EU Military Committee (EUMC).

⁷⁴ Council Decision (CFSP) no. 2015/1835 (Defining the Rules of the European Defense Agency), Chapter II, Article 9, Section 3.

majority voting if no member state objects.⁷⁵ PESCO makes no such pretense, in the Council decisions are made mostly unanimously.⁷⁶ Within projects, PESCO allows for pMS to adopt alternative voting rules – flexibility comparable to that shown by OCCAR and the EDA.⁷⁷

The EDA and PESCO provide comparable space for international organization’s representation in decision making. Besides member states, the following bodies have a (nonvoting) seat at the steering board: the EDA’s Chief Executive, representatives from the Commission, EEAS, and EUMC, as well as, by invite, representatives from NATO other relevant international organizations like OCCAR or the European Space Agency (ESA).⁷⁸ In comparison, the EEAS, which chairs the PSC and PMG council formats that govern PESCO, is the sole direct international voice.⁷⁹ Instead, PESCO indirectly channels international (and military) influence via its secretariat’s and the EUMC’s evaluations of project proposals and annual reports on pMS’ contributions.⁸⁰ Limiting international influence is a constant since armaments organizations first hired permanent staff, and PESCO and the EDA’s relegation of

⁷⁵ Amendment to Annex IV Decision-Making Process of the OCCAR Convention, UK-FR-GE-IT-SP-BE, March 15, 2017, Article 1, <https://www.occar.int/occar-rules>.

⁷⁶ Council Decision (CFSP) no. 2017/2315 (Establishing PESCO), Annex III – Governance, Article 1.

⁷⁷ Council Decision (CFSP) no. 2018/909 (establishing a common set of governance rules for PESCO projects), June 25, 2018, OJ L 161/37, Article 4, Section 4, <http://data.europa.eu/eli/dec/2018/909/oj>.

Council Decision (CFSP) no. 2015/1835 (Defining the Rules of the European Defense Agency), Chapter IV, Article 19, Section 5, Clause a.

⁷⁸ *Ibid.*, Chapter I, Article 8, Section 6.

⁷⁹ “Political and Security Committee (PSC),” Council of the European Union, European Union, accessed May 11, 2023, <https://www.consilium.europa.eu/en/council-eu/preparatory-bodies/political-security-committee/>.

“Politico-Military Group (PMG),” Council of the European Union, European Union, accessed May 11, 2023, <https://www.consilium.europa.eu/en/council-eu/preparatory-bodies/politico-military-group/>.

⁸⁰ Council Decision (CFSP) no. 2017/2315 (Establishing PESCO), Annex III – Governance, Article 2, Section 2, Clause 1.

military voices – in the EUMS and the EUMC – to an advisory role continues a tradition dating back to the IEPG.

The EDF is the first supranationally governed armaments organization. The European Commission's Directorate-General for Defense Industry and Space (DG DEFIS) decides which projects receive awards from the EDF. With the assistance of a group of independent experts, Commission staff assess the projects, screen them for ethical concerns, and determine the selection and award procedures.⁸¹ Member states exercise influence over the fund in two ways. Indirectly, they influence it via the Council's legislative oversight, as well as the negotiations over the annual budget and the multiannual financial framework. Directly, they influence the fund via a committee composed of member state representatives.⁸² The committee assists the Commission in devising the annual work programs that motivate and organize the calls for proposals. The Commission should aim for the widest possible support within the committee.⁸³ In the committee, the EDA has observer status, and the EEAS may advise it; missing from the regulation establishing the EDF is any mention of the EUMS.⁸⁴ Granted, the EUMS is housed within the EEAS, however, the service lacks the observer status granted to the EDA. Therefore, the EDF carries on the tradition established since the second phase's IEPG of limiting the voices of military representatives.

The EDF deviates from recent organizational design trends, escaping path dependency. First, the fund vests decision-making power in the hands of Commission bureaucrats, which

⁸¹ Council and Parliament Regulation no. 2021/697 (establishing the European Defence Fund), Preamble, Sections 39, 47.

⁸² *Ibid.*, Preamble, Section 18.

⁸³ *Ibid.*, Preamble, Section 39.

⁸⁴ *Ibid.*, Preamble, Section 44, and Article 34.

returns technocrats to the selection of co-development projects for the first time since the 1950's. In armaments co-development, among other interests, the military prioritizes maximizing military power by meeting its capability requirements cost-effectively; politicians balance against this with electoral considerations by distributing jobs across electoral constituencies; and supranational bureaucrats prioritize cost-effectiveness achieved through international cooperation to maintain elected officials' trust and, thus, their own power.⁸⁵ By vesting power in the Commission, the EDF limits politicians' ability to inefficiently select projects based on the widest distribution of jobs and national capability requirements.⁸⁶ Second, the European Parliament decides, in conjunction with the Council, the EDF's budget – the first instance of direct parliamentary budgetary control over an armaments organization.⁸⁷ The combination of standard EU budget rules and oversight, as well as international bureaucrats' interest in promoting international cooperation by demonstrating its effectiveness, increases the likelihood that EDF-projects deliver on time and on budget.

SECTION 3.5: RESOURCES

With two decades of strengthening armaments organizations behind them, the EDF and PESCO can draw on more resources than past organizations. DeVore (2012) defines resources as staff and the budgets they control, however, I expand upon this to include the relationships between armaments organizations, which allow the organizations to draw upon one another's

⁸⁵ DeVore, "Producing European armaments," 443.

⁸⁶ The EDF limits but does not eliminate member state haggling over the distribution of jobs created. Projects must involve three firms from three member states and member states should have expressed interest in procuring the weapons system developed or utilizing the technology researched.

Council and Parliament Regulation no. 2021/697 (establishing the European Defence Fund), Preamble, Section 30.

⁸⁷ Ibid., Preamble, Sections 39.

competencies and resources.⁸⁸ With each organization specializing in the capability developments process, a project benefits from a greater and more efficiently applied knowledge base.

Alone, PESCO possesses few resources. Its secretariat merely collates information from the projects and issues progress reports, and personnel seconded from the EDA, EEAS, and EUMS staff the secretariat. Nor does PESCO possess its own budget outside of the funds necessary to pay for the secretariat's work and the classified electronic portal that centralizes information on the projects. However, PESCO has access to greater resources than first thought because of its relationships. PESCO commits pMS to "the use of EDA as the European forum for joint capability development and consider the OCCAR as the preferred collaborative program managing organization."⁸⁹ More specifically, project members can "apply the project management tools used by the EDA, such as project arrangements, common staff targets, common staff requirements, or business cases."⁹⁰ PESCO benefits too from other organizations' financial resources: projects handed over to the EDA can access the agency's budget and the EDF provides a bonus 10% funding towards projects associated with PESCO.⁹¹ The EDF bonus comes with the suggestion that funded projects should be jointly procured, "in particular through a central purchasing body," i.e., OCCAR or the EDA.⁹²

⁸⁸ DeVore, "Organizing international armaments cooperation," 436.

⁸⁹ Council Decision (CFSP) no. 2017/2315 (Establishing PESCO), Annex II - List Of Ambitious And More Binding Common Commitments In The Five Areas Set Out By Article 2 Of Protocol No 10, Section e, Clause 18.

⁹⁰ Council Decision (CFSP) no. 2018/909 (establishing a common set of governance rules for PESCO projects), Article 7.

⁹¹ Council and Parliament Regulation no. 2021/697 (establishing the European Defence Fund), Article 13, Section 3.

⁹² *Ibid.*, Preamble, Section 29.

PESCO and the EDF's relational benefits have precedent in OCCAR and the EDA's relationship. The latter two organizations signed an agreement in 2012 to define their respective responsibilities and placements in the capability development process. The EDA is upstream of OCCAR. On a project, the agency, working with pMS, formulates common requirements and conducts R&T, before handing the project off to OCCAR to translate that work into a manufacturable product and oversee the project for the duration of its lifespan. Multiple projects initiated by pMS at the EDA have been carried on at OCCAR.⁹³ PESCO and the EDF benefit from over a decade of relationship building between their predecessors and they fill roles in the capability development process unfilled by OCCAR and the EDA. As with their mandates and memberships, path dependency influences the resources available to PESCO and the EDF. The exception is the EDF's €8 billion budget drawn from the EU's budget – an unprecedented funding stream for armaments cooperation.

SECTION 3.6: INTERIM CONCLUSIONS

PESCO and the EDF evolved largely path dependently from earlier armaments organizations. Their mandates, while broadly resembling those of OCCAR and the EDA, differ in the details. In other words, each of the organizations plays a unique role in the web of armaments cooperation, thereby allowing them to specialize. In PESCO, member states begin the process by proposing projects. The EDF's financial incentives encourages projects to incorporate European priorities encapsulated in the CDP and to choose OCCAR or the EDA to implement their PESCO project. The mandate of all four organizations is armaments development, but each has its niche: PESCO for proposals, the EDF for incentivizing cooperative behavior, the EDA to

⁹³ OCCAR, "OCCAR & EDA build links, seeking efficiencies through cooperation," July 27, 2012, <https://www.occar.int/occar-eda-build-links-seeking-efficiencies-through-cooperation>.

bind PESCO and the EDF together by serving as a clearinghouse of EU defense cooperation, and OCCAR to manage the transition to production and joint procurement. All four organizations' similarly layered membership model enables projects to move between the organizations by giving, say, the Commission, a voice in a project's management at OCCAR if the EDF is funding the project.

Where the EDF, and, to a lesser extent PESCO, differentiate themselves from OCCAR and the EDF is their representation and their resources. Beginning with PESCO, its added benefits manifest themselves in its structuring of member states' proposals for cooperation. First, it simplifies project governance by providing sample governance rules that pMS can adopt for their project. Second, PESCO launches new projects every two years and sets a strict deadline for submissions. With each subsequent round, the friction of cooperation should decrease as defense ministries, firms, and international staff grow more familiar with one another and accustom themselves to cooperating.⁹⁴ Third, with the EDA in its secretariat, PESCO benefits from the agency's role as a clearinghouse for EU defense cooperation. The agency runs its own projects and writes the CDP and CARD. The agency brings that experience to bear in PESCO's secretariat when evaluating project proposals, pMS' annual implementation plans. This brings me to my first expectation: the EDA's representation in PESCO's secretariat ought to encourage projects to take into account European priorities. The EDF contributes to the incentivization too when it funds PESCO projects, because the CDP guides the Commission when it writes the EDF's Indicative Multiannual Perspective and the fund's annual work programs. In other words,

⁹⁴ Beatriz Cózar Murillo, *Bring back the spirit of PESCO!*, (Egmont Royal Institute for International Relations, June 8, 2023):2, <https://www.egmontinstitute.be/bring-back-the-spirit-of-pesco/>.

when a PESCO project accepts EU-funding, it implicitly allows the Commission's perspective into the project.

This brings me to my second and third expectations. EU-funded projects commit themselves to greater transparency and more stringent planning. As Illustration 2 shows, most PESCO projects have a few sentences of description and a list of pMS, whereas EU-funded projects have factsheets with timelines, budgets, and industry partners, as well as, often, webpages to share updates. EU-funded projects, thanks to pressure of meeting the Commission and the public's expectations, ought to demonstrate greater progress than PESCO projects developed by the pMS ad-hoc. Summarizing my first two expectations, PESCO and the EDF's relationship to one another and to the EDA and OCCAR should have produced a web of cooperation structured to take into account European priorities, while being subject to greater scrutiny. If so, then this ought to bring the realities of armaments cooperation – conflicting national priorities and clunky, slow, ad-hoc governance – closer to the theoretical benefits – economies of scale and improved interoperability – thereby incentivizing further cooperation. That is my third expectation. Whether these three expectations manifest themselves is the topic of the next chapter.

CHAPTER 4: TESTING HISTORY'S EXPECTATIONS

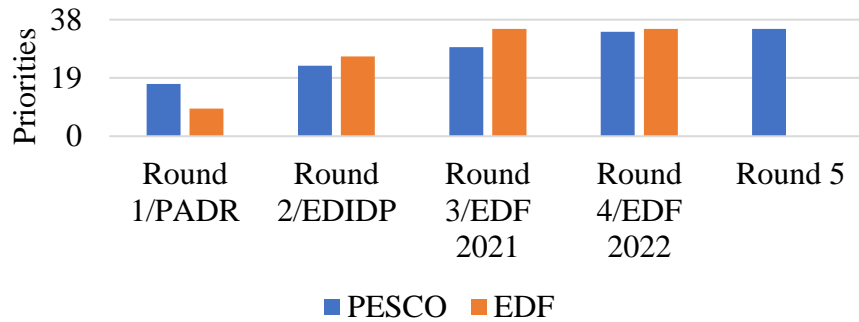
SECTION 4.1: RELEVANCE

In Appendix 2, I document my judgements of the projects, here, I present the key findings. Besides matching projects, I also sort them by whether their activities fall under R&T – fundamental to applied research – or R&D – prototyping and application. Projects of an operational nature fall under R&D.

Returning to my initial expectation, PESCO and the EDF ought to produce projects that take greater account of European capability requirements, rather than solely correlating to national demands. Unlike earlier organizations, PESCO and the EDF integrate into the broader network of EU defense organizations. In PESCO's case, it grants bodies like the EDA, the EEAS, and the Commission a modicum of representation, and, in the EDF's case, the Commission is most represented in the decision-making. By providing EU organizations' a voice in them, both organizations are likelier to take European-wide priorities into account.

Broadly, PESCO and the EDF succeeded: of 235 PESCO and EU-funded projects, only 23 fail to clearly address at least one of the CDP's 38 priority areas. Broken down by organization, five of 72 PESCO projects fail to correspond to a priority area and 18 EU-funded

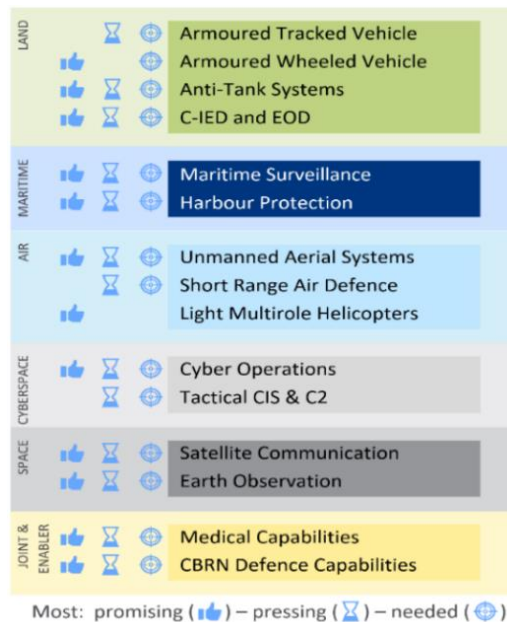
Figure 2 – Cumulative Priorities with Associated Projects



Source: Author’s own compilation.

of 163 EU-funded projects fail to correspond to a priority area. This is not a commentary on the merits of this minority of projects – they merely do not address the most urgently needed capabilities. Both organizations’ projects also cover a wide range of the CDP’s 38 priority areas – see Figure 2. However, comprehensive coverage of the priority areas could be an exercise in box checking; the ambitions of the projects must be weighed too.

Illustration 3 – 2022 CARD’s Ambitious Priorities



Source: European Defense Agency, 2022 *Coordinated Annual Review on Defence Report*, 8.

The EU's CARD reports narrow in on the "most promising, most needed, or most pressing" capabilities included in the CDP.⁹⁵ Every two years, CARD takes a snapshot of member states' defense planning and budgeting. The inaugural 2020 report identified the following priorities: main battle tanks (MBT), improved soldier systems, a European Patrol Class (EPC) surface ship, air defense, a coordinated European defense in space, and enhanced military mobility - including improved sea and air lift and resilience amidst hybrid warfare. The subsequent 2022 CARD report updated these recommendations with new, additional collaborative opportunities, see Illustration 3. PESCO and the EDF acted on these recommendations.

Beginning with ground capabilities, MBTs saw the least action: PESCO's 2021 fourth round included an MBT simulation center and the EDF has poured nearly €105 million into two rounds of the FAMOUS project, which aims to "develop next generation armoured platforms and upgrades existing platforms [...] including MBTs."⁹⁶ However, neither the industry coordinator for FAMOUS, Finland's Patria, nor any other member of the industrial consortium builds main battle tanks.⁹⁷ Though MBTs lack institutionalized European cooperation, the FAMOUS projects

⁹⁵ European Defense Agency, *Factsheet 2022 CARD Report*, page 2;

European Defense Agency, *2022 Coordinated Annual Review on Defence Report*, page 8.

⁹⁶ European Commission, European Defense Industrial Development Program, *FAMOUS*, June 30, 2021, https://defence-industry-space.ec.europa.eu/famous_en.

European Commission, European Defense Fund, *FAMOUS2*, July 20, 2022, https://defence-industry-space.ec.europa.eu/funding-and-grants/calls-proposals/european-defence-fund-2021-calls-proposals-results_en#summary-of-edf-2021-selected-projects---factsheet.

⁹⁷ Christopher F Foss and Mark Cazalet, "Future Main Battle Tanks," *European Security and Defence*, December 7, 2022, <https://euro-sd.com/2022/12/articles/28414/future-main-battle-tanks/>.

"Vehicles," Products and services, Patria, accessed May 23, 2023, <https://www.patriagroup.com/products-and-services/protected-mobility-and-defence-systems/vehicles>.

address CARD 2022's rating of armored vehicles as 'most needed.'⁹⁸ Other ground combat capabilities, like soldier systems and CBRN defense capabilities, enjoyed more attention than MBTs. For example, the EDF has funded seven soldier system projects worth €154 million.⁹⁹

For naval capabilities, PESCO demonstrated greater responsiveness to CARD. The 2020 report recommended collaborating on a European Patrol Class ship and unmanned maritime systems. The 2022 report recommended cooperating on maritime surveillance and harbor protection.¹⁰⁰ Beginning with the EPC, PESCO initiated its European Patrol Corvette *prior* to the report, but the project gained momentum *after* the report's publication.¹⁰¹ In 2022, the EDF's 2021 work program selected a consortium for the EPC and awarded them €60 million, and the Commission handed the project off to OCCAR to implement.¹⁰² A year after the 2020 CARD Report recommended unmanned maritime systems, PESCO's fourth round launched with its

"Our Armored Vehicles," Arquus Defense, accessed May 23, 2023, <https://www.arquus-defense.com/our-armored-vehicles>.

"UGV Solutions," Escribiano Mechanical and Engineering, accessed May 23, 2023, <https://www.eme-es.com/ugv-solutions/>.

⁹⁸ The Franco-German Main Ground Combat System (MGCS) meets this CDP priority, but it has neither been integrated into PESCO or OCCAR, nor has it received EDF-funding; MGCS is likely to be delayed.

Sarah Werner, „Geheimer Bericht offenbart den Machtkampf um unseren neuen Superpanzer,“ *Focus.de*, April 29, 2023, https://www.focus.de/finanzen/news/im-streit-um-gemeinsames-panzerprojekt-verhaken-sich-deutschland-und-frankreich_id_192351270.html.

⁹⁹ These are, per the author's own compilation, ACAMSII, GOSSRA, and VESTLIFE under PADR, ECOBALLIFE, ACHILE, LODESTAR, and Nano-SHIELD under the EDF 2021, and ARMETISS, ACROSS, and WEMOR under the EDF 2022.

¹⁰⁰ European Defense Agency, *2022 Coordinated Annual Review on Defence Report*, page 8.

¹⁰¹ "European Patrol Corvette," PESCO, European Union, accessed May 23, 2023, <https://www.pesco.europa.eu/project/european-patrol-corvette-epc/>.

¹⁰² European Commission, European Defense Fund, *EPC*, July 20, 2022, https://defence-industry-space.ec.europa.eu/funding-and-grants/calls-proposals/european-defence-fund-2021-calls-proposals-results_en#summary-of-edf-2021-selected-projects---factsheet.

European Commission, "European Commission, EDA and OCCAR sign European Defence Fund Contribution Agreements," December 14, 2022, https://defence-industry-space.ec.europa.eu/european-commission-eda-and-occar-sign-european-defence-fund-contribution-agreements-2022-12-14_en.

Medium size Semi-Autonomous Surface Vehicle (M-SASV). The EDF's 2022 work program awarded an associated project €65 million.¹⁰³ Finally, CARD 2022's maritime recommendations, see Illustration 3, are unusual, given that two PESCO projects launched in 2018 already fit the recommendations. Neither project, as the subsequent progress section shows, is stagnating. Both have associated EDF-funded projects.¹⁰⁴ Nevertheless, a fifth-round project launched in 2023, Critical Seabed Infrastructure Protection, also addresses CARD 2022's maritime recommendations.

On air and space, PESCO and the EDF present a more mixed picture. Four PESCO projects deal with air defense and next generation helicopters, of which two have EDF funding. Unlike the EPC and several of the soldier system projects, none of these projects plans to deliver operational capabilities to European militaries soon. For the EDF-funded projects, their focus is studies and designs, and for the newer PESCO projects, as yet without EDF support, the focus is on harmonizing pMS' requirements.¹⁰⁵ In comparison to aerial systems, the two organization's space-efforts are much more ambitious. Across EDF, PADR, and EDIDP, the Commission has

¹⁰³ European Commission, European Defense Fund, *EUROGUARD*, June 26, 2023,

https://defence-industry-space.ec.europa.eu/funding-and-grants/calls-proposals/result-edf-2022-calls-proposals_en.

¹⁰⁴ EDIDP 2019's DECISMAR for PESCO's Upgrade of Maritime Surveillance (UMS) and EDIDP 2020's PADIC for PESCO's Harbor and Maritime Surveillance and Protection (HARMSPRO).

¹⁰⁵ European Commission, European Defense Fund, *EU HYDEF*, July 20, 2022, https://defence-industry-space.ec.europa.eu/funding-and-grants/calls-proposals/european-defence-fund-2021-calls-proposals-results_en#summary-of-edf-2021-selected-projects---factsheet.

European Commission, European Defense Fund, *JEY-CUAS*, July 20, 2022, https://defence-industry-space.ec.europa.eu/funding-and-grants/calls-proposals/european-defence-fund-2021-calls-proposals-results_en#summary-of-edf-2021-selected-projects---factsheet.

¹⁰⁵ "Integrated Multi-Layer Air and Missile Defence system (IMLAMD)," PESCO, European Union, accessed May 23, 2023, <https://www.pesco.europa.eu/project/integrated-multi-layer-air-and-missile-defence-system-implamd/>.

"Next Generation Medium Helicopter (NGMH)," PESCO, European Union, accessed May 23, 2023, <https://www.pesco.europa.eu/project/next-generation-medium-helicopter-ngmh/>.

awarded €236 million to R&T and R&D of space systems. The most prominent projects are PESCO's EU Space Surveillance Network (EU-SSA-N), which the EDF plans to shower with money and TWISTER, which received €190 million for the study and design of a European ballistic missile defense interceptor and early warning system.¹⁰⁶

Compared to earlier organizations, PESCO and the EDF's projects ought to better reflect European priorities because they encourage and rely upon agreed-upon common strategic guidance documents like the CDP and CARD. At a general level, that is the case: all but three CDP priorities have one or more projects associated with them. Few projects do not correspond to any of the priorities. Shifting from generalities to projects' specifics, the two organizations have improved their incorporation of European priorities. PESCO's initial two rounds and the EDF's two predecessors-initiated projects before CARD's initial report – they relied solely upon the CDP's lengthy unprioritized list of capabilities. After CARD's 2020 report, and again after its 2022 report, both organizations launched projects that met CARD's more specific ambitious list of collaborative opportunities. This is the web of cooperation in action: treated as a collective, these organizations produce more impressive results than when they are handled individually. One collaborative mechanism – CARD – informing the others, allowing them to learn organizationally and initiate projects that better reflect European priorities. Nevertheless, these are on-paper results – projects' descriptions taken at face-value without considering the

¹⁰⁶ European Commission, *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*, C(2023) 2296, https://defence-industry-space.ec.europa.eu/eu-defence-industry/european-defence-fund-edf_en, pages 14-15;

TWISTER is associated with EDF 2021's EUHYDEF and EDF 2022's ODIN's EYEII.

European Defense Fund, *EU HYDEF*.

European Commission, European Defense Fund, *ODIN's EYEII*, June 26, 2023, https://defence-industry-space.ec.europa.eu/funding-and-grants/calls-proposals/result-edf-2022-calls-proposals_en.

projects' implementation. Alone they cannot reveal whether projects will live up to their promises and deliver new capabilities and research for European militaries. For that, I turn to my evaluation of PESCO projects' punctuality.

SECTION 4.2: PROGRESS

In this section, I narrow my focus to the 47 PESCO projects from the initial four rounds. I exclude fifth round projects because they launched too soon to this thesis' publication date to generate any results. I exclude EDF projects because I use them as evidence in my evaluation of PESCO projects' progress. For the evidence of each project's progress or lack thereof and each project's classification, see Appendices 4 to 7 for, respectively, rounds one to four.

I expect PESCO projects funded by the EDF to demonstrate greater progress or punctuality than projects without. By accepting EU funds, projects subject themselves to supranational oversight by the Commission's staff, as well as greater transparency requirements such as, for example, building a project website to post updates. Projects without EU funding more closely resemble those carried out under earlier armaments organizations like the IEPG, where oversight functions rested in the hands of the participating member states. Granted, by relying on the EDA and EEAS to staff PESCO secretariat, PESCO provides a modicum of representation to international staff, who can subject projects to internal oversight in a way that the IEPG never could.

32 PESCO projects from the initial four rounds have received EU funding – only one has closed. EuroArtillery closed in 2023, despite the EDIDP providing €7 million to two associated

projects.¹⁰⁷ Unlike most other EU-funded projects studied, neither has a webpage to communicate their objectives and share updates, nor is either project included in the Commission’s database of EDF projects for 2021-2027.¹⁰⁸ The French firm Nexter coordinates one of the projects and participates in the other; its last press-release merely mentioning either was February 2022.¹⁰⁹ The press release provided no details concerning either the projects’ start date or expected end. The coordinator of the non-Nexter led EDIDP-funded project, Everis Aeroespacial Y Defensa, collapsed in 2022 due to internal infighting.¹¹⁰ The status of these EDIDP projects is unclear, what is not is PESCO’s EuroArtillery. That EuroArtillery’s closure occurred after corporate infighting at one of its associated projects suggests that this singular project’s closure is the exception that proves the rule: EU-funding brings much-needed transparency and oversight pressures to PESCO projects.

Without EU-funding, PESCO projects languish in anonymity. 29 projects from the initial four rounds have received no EU funding – 15 of them are closed, stagnant, or in an unclear state. In other terms, 62 percent of PESCO projects without EU funding appear unlikely to deliver results. The Council’s response to the 2022 PESCO Annual Report, which includes the fourth round, aligns with my findings. It reported that “nearly half of the [60] projects are

¹⁰⁷ European Commission, European Defense Industrial Development Program, *e-COLORSS*, June 30, 2021, https://defence-industry-space.ec.europa.eu/colorss_en.

European Commission, European Defense Industrial Development Program, *FIRES*, June 30, 2021, https://defence-industry-space.ec.europa.eu/fires_en.

¹⁰⁸ Funding and tender opportunities database (programming period 2014-2020; European Defence Industrial Development Program), European Commission, accessed June 2, 2023, <https://ec.europa.eu/info/funding-tenders/opportunities/portal/screen/opportunities/projects-results;programCode=EDF>.

¹⁰⁹ KNDS, “Nexter Étoffe sa Participation dans Les Projets du Fonds Européen de Défense,” February 10, 2022, <https://www.knds.fr/actualites/nos-dernieres-actualites/nexter-etoffe-sa-participation-dans-les-projets-du-fonds>.

¹¹⁰ Roberto Bécares, Cristina Gallardo, Tono Calleja Flórez, “La guerra interna en la filial armamentística de Everis hundió la compañía: pérdidas de 70,6 millones,” *El Periódico de España*, December 30, 2022, <https://www.epe.es/es/politica/20221230/guerra-interna-filial-armamentistica-everis-hundio-compania-80286581>.

Table 1 – Rounds One to Four: PESCO Projects’ Progress

EU-Funded	32	OCCAR or EDA Implementation:	12	Operational:		-	
				Defined End-Date and Outputs:	12	On-Time:	2
						Progressing:	10
				Unclear:		-	
				Stagnant:		-	
	Closed:		-				
	pMS Implemented:	20	Operational:		-		
			Defined End-Date and Outputs:	19	On-Time:	6	
					Progressing:	13	
			Unclear:		-		
Stagnant:			-				
Closed:		1					
Not EU-Funded	29	OCCAR or EDA Implementation:	1	Operational:		-	
				Defined End-Date and Outputs:	1	On-Time:	-
						Progressing:	1
				Unclear:			
				Stagnant:			
	Closed:						
	pMS Implemented:	28	Operational:		2		
			Defined End-Date and Outputs:	11	On-Time:	2	
					Progressing:	9	
			Unclear:		7		
Stagnant:			5				
Closed:		3					

Source: Author’s own compilation.

expected to deliver concrete results by 2025.”¹¹¹ Of the roughly 30 *not* delivering results by 2025, the 11 fourth-round projects not in the Strategic Review can be subtracted. That leaves around 19 projects from the initial three rounds that are not delivering results by 2025. In my research, I find 14 projects with associated EDF-funded projects that plan to deliver after 2025. Using the Council’s figures, that results in roughly five projects with an unknown status. In comparison, I find that four projects have stagnated, alongside the three closed in May 2023.

¹¹¹ Council Recommendation (assessing the progress made by the participating Member States to fulfil commitments undertaken in the framework of the permanent structured cooperation (PESCO)), November 14, 2022, OJ C 433/02, Chapter II – Findings and Recommendations, PESCO Projects, Article 10, https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=OJ:JOC_2022_433_R_0002.

What explains the two-project discrepancy between the Council’s figures and mine?

First, there could be no disparity; the Council says ‘nearly half’ of the 60 projects, which need not mean 30 projects, like I assumed it did for simplicity’s sake. Second, on the Council’s side, it is unlikely that they mistakenly believed any of the three projects that closed in May 2023, after their report, would deliver results by 2025.¹¹² Third, and the other likely source of the disparity: two stagnant projects were included in the 2020 Strategic Review – at one point they appeared promising.¹¹³ One, Materials and Components for Technological EU Competitiveness (MAC-EU), appears likelier to deliver results than the other. The EDF Indicative Multiannual Perspectives devote an entire section to the topic, but the PESCO project’s specific goals and connection to the EDF remain unclear because the coordinating pMS’ defense ministry website contains no information on the project. In sum, my classification of PESCO projects aligns with the Council’s figures, though their refusal to name projects prevents a corroboration of the specific projects I consider stagnant. The difficulty of discerning the status of these projects illustrates the peril of PESCO projects not obtaining EU-funding and the much-needed transparency it brings.

Across the board progress is good, but equally important is the status of PESCO’s most ambitious projects. The EPC illustrates the importance of the web of armaments organizations, as well as of the EDF’s resources, in successful collaboration. PESCO’s third round, launched in November 2019, included the EPC with Italy coordinating and France participating – Greece and

¹¹² Jacopo Barigazzi, “EU military projects face delays, leaked document shows,” *PoliticoEU*, July 12, 2022, <https://www.politico.eu/article/leaked-document-shows-delays-in-eu-military-pact/>.

¹¹³ Stagnant projects in the Strategic Review, per the author’s own compilation: from the second round, the Joint EU Intelligence School (JEIS) [also reported to IISS a delivery date of March 2021]; from the third round, Materials and Components for Technological EU competitiveness (MAC-EU).

Spain joined in 2020.¹¹⁴ The project made no progress until January 2021, when the pMS delegated the EDA to harmonize the requirements among the four pMS.¹¹⁵ The pMS set a self-imposed deadline of 2026-2027 for a sailing prototype. Commensurate with this schedule, the pace of progress increased with the help of the EDF and OCCAR. In mid-2022, the fund awarded a consortium €60 million to study and design the ship over 36 months, and in December of that year the Commission signed an agreement with OCCAR enabling it to manage the EPC.¹¹⁶ As the project has progressed, its membership has grown: Denmark and Norway are contributing funds and Romania joined as a participant in May 2023.¹¹⁷ Most recently, the 2023 EDF Work Program foresees contributing €156.5 million to OCCAR to complete design work and test a prototype.¹¹⁸ The project appears on track to test a prototype by 2026-2027, as originally expected.

At each step of the process, the EPC could rely on a specialized, knowledgeable organization. PESCO brought together interested member states, the EDA harmonized their competing demands, the EDF imposes and incentivizes compliance with strict objectives and a demanding schedule, and OCCAR manages the relationship between pMS and industry. Under

¹¹⁴ European Union, *PESCO, Permanent Structured Cooperation (PESCO)'s projects – Overview* [As of the Third Round], November 12, 2019, https://www.consilium.europa.eu/en/press/press-releases/2019/11/12/defence-cooperation-council-launches-13-new-pesco-projects/#new_tab.

¹¹⁵ European Defense Agency, “EDA to support ‘European Patrol Corvette’ PESCO project,” January 4, 2021, <https://eda.europa.eu/news-and-events/news/2021/01/04/eda-to-support-european-patrol-corvette-pesco-project>.

¹¹⁶ European Commission, European Defense Fund, *EPC*, July 20, 2022, https://defence-industry-space.ec.europa.eu/funding-and-grants/calls-proposals/european-defence-fund-2021-calls-proposals-results_en#summary-of-edf-2021-selected-projects---factsheet.

¹¹⁷ Italian Defence Technologies, “Fincantieri: at the OCCAR-EA the Contribution Agreements signed for the European Patrol Corvette (EPC),” December 15, 2022, <https://www.italiandefencetechnologies.com/fincantieri-at-the-occar-ea-the-contribution-agreements-signed-for-the-european-patrol-corvette-epc/>.

European Union, *PESCO, Permanent Structured Cooperation (PESCO)'s projects – Overview* [As of the Fifth Round], May 23, 2023, https://www.consilium.europa.eu/media/64627/pesco-projects-overview_update_2023.pdf.

¹¹⁸ European Commission, *the adoption of the work programme for 2023 - Part II*, C(2023) 2296, page 32.

IEPG in the 1980's, pMS would have needed to haggle over requirements workshares before, perhaps, convincing their shipbuilders to form an ad-hoc temporary multinational company to build the project.¹¹⁹ Even under OCCAR in the early 2000s, pMS would have lacked supranational funding from the Commission to grease the wheels of collaboration. The current web of cooperation, by giving supranational staff a voice and the resources to convince states to listen to them, has several benefits compared to earlier eras of cooperation. In line with my historically derived expectations, it delivers projects that incorporate European priorities by referring to agreed-upon EU guidance documents and it delivers them on-time by replacing ad-hoc political haggling with structured forums and third-party oversight. Nor ought the EPC be an outlier, the benefits of today's cooperation are such that they ought to generate a positive feedback loop incentivizing more cooperation.

SECTION 4.3: INCREASED COOPERATION

PESCO and the EDF's performance validate my initial two expectations. Projects increasingly incorporate European priorities, and more EU-funded projects demonstrate progress than projects implemented by pMS without incentive EU funding incentivizing cooperation. This is one half of the story; the other half is the positive feedback cycle: easier, more lucrative cooperation begetting more cooperation. In this section, I discern the existence, or not, of that virtuous cycle through three metrics; see Appendix 3 for the underlying data. I begin with the incentives that ought to drive the cycle: the share of EU funding allocated to PESCO projects. Then, I turn to where the money is going and the share of projects in which the EDA and/or

¹¹⁹ DeVore, "Producing European armaments," 457.

OCCAR have a voice. Finally, I consider whether PESCO projects are adding members over time; a sign that member states view the projects as viable and beneficial.

PESCO projects dominate the EDF, and its precursor the EDIDP. The logic behind that relationship is simple, the EU promises a 10 percent bonus to any project associated with a PESCO project which should lead to PESCO projects seizing the lion's share of the budget. Figure three, and the data in Appendix 3, support that conclusion. Nearly 60 percent of the EDF's funding went to projects associated with PESCO even though only a quarter of the EDF's projects were associated with PESCO.¹²⁰ That so few PESCO projects eat up the majority of the fund's budget suggests that more ambitious PESCO projects tend to apply for EU funding. Consider PESCO's TWISTER, which aims to build a European ballistic missile defense system. That system comprises a space-based component to warn of incoming missiles and an interceptor to shoot them down. Neither part is cheap, and both have received EU-funding: €90 million to study and design the early warning constellation and €100 for an interceptor design.¹²¹ The 2023 EDF Indicative Multiannual Perspective foresees allocating an additional €81.5 for a competing

¹²⁰ The EDIDP allocated a greater share of its budget to PESCO projects because it had a smaller budget €500 million and it directly awarded two PESCO projects, Eurodrone and ESSOR, €132.7 million. Those two projects alone swallowed 27 percent of the EDIDP's budget.

European Commission, European Defense Industrial Development Program, *MALE RPAS*, November 20, 2020, https://defence-industry-space.ec.europa.eu/male-rpas_en.

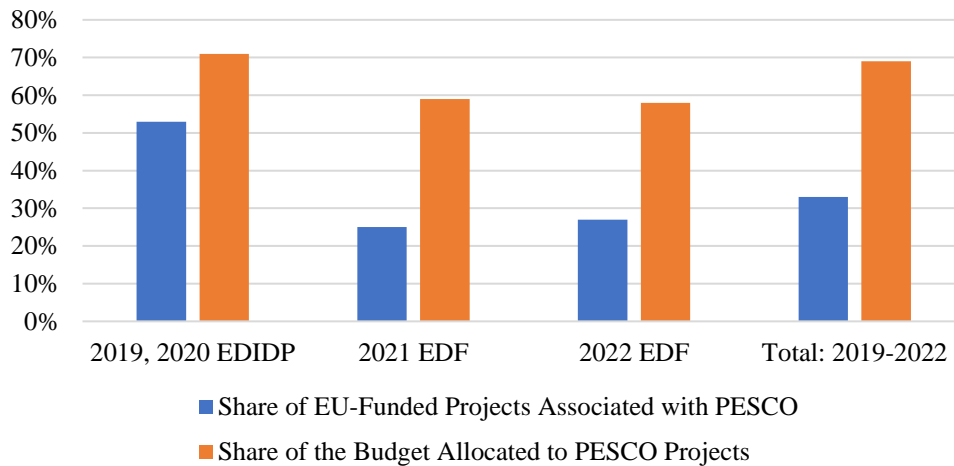
European Commission, European Defense Industrial Development Program, *ESSOR*, June 30, 2021, https://defence-industry-space.ec.europa.eu/essor_en.

¹²¹ European Defense Fund, *EU HYDEF*.

European Defense Fund, *ODIN's EYEII*.

interceptor design from a competing consortium jilted in the earlier EDF bidding process.¹²² Are TWISTER’s ambitions an outlier in PESCO?

Figure 3 – Share of EU-Funded Projects Associated and Allocated to PESCO Projects



Source: Author’s own compilation.

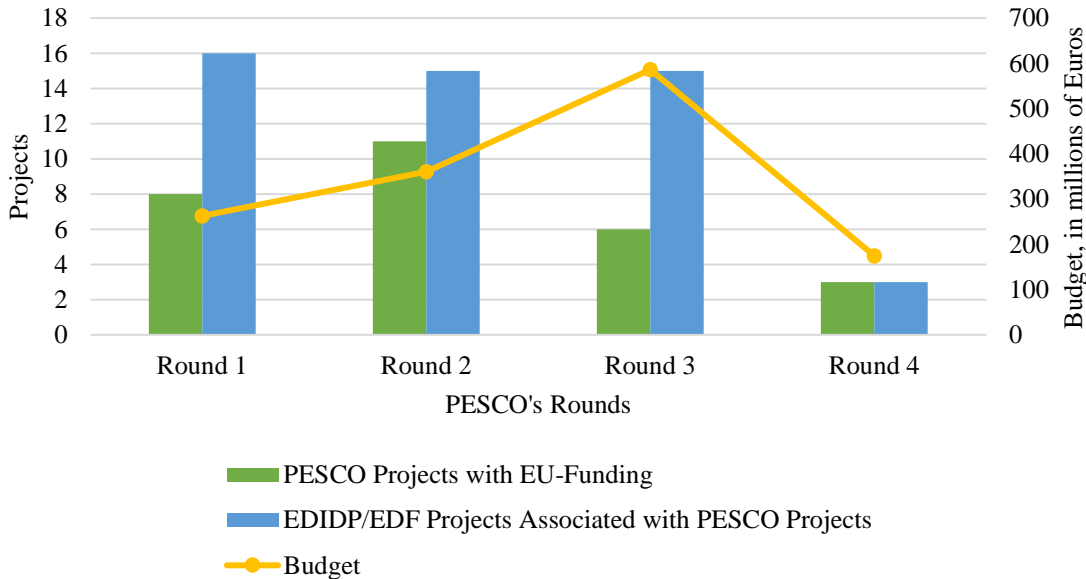
No, PESCO’s ambitions are growing. Figure 4 shows, per round, the budget, the number of EDF-funded projects associated with each round, and the number of PESCO projects in each round that had associated EDF projects.¹²³ The difference between the number of EDF projects and the number of PESCO projects emphasizes that only a subset of PESCO projects receives EU funding. The larger the difference then the fewer PESCO projects with EU-funding, which gives those projects a chance at a larger slice of the pie. Comparing rounds two and three

¹²² European Commission, *the adoption of the work programme for 2023 - Part II*, C(2023) 2296, page 29.

¹²³ Round Four received less funds because it only became eligible for EDF funding with the 2022 work program; it launched too late for the 2021 EDF program. In comparison, the other three rounds were eligible for four rounds of funding: the EDIDIP in 2019 and 2020, and the EDF in 2021 and 2022. Nothing suggests fourth round projects will receive a smaller share of funds than the other rounds.

illustrates this dynamic. Both rounds have 15 EDF projects associated with them, which represents 31 percent of all EDF projects associated with PESCO. Neither rounds' funding is

Figure 4 – PESCO's Relationship to the EDF



Source: Author's own compilation.

proportional to their share of the EDF's associated projects: whereas round two eats up 26 percent of the budget, round three consumes 42 percent. The funding disparity arises despite fewer round-three PESCO projects receiving EDF funding. A smaller selection of better funded projects suggests that PESCO's ambitions grew between round two and three. In other words, the pMS entrusted more complicated projects to PESCO, which suggests they are growing more trusting of PESCO's structures and accustomed to PESCO processes. The rising EU funding allocated to each round suggests that the prospect of EDF funding is fueling the growing quality of cooperation.

Quality is only one half of cooperation; quantity matters too when evaluating the expectation of a positive feedback loop. I approach quantity from two angles. First, I consider the growth in projects' membership over time. Adding members to a project represents more than

another state desiring a new capability. When a state joins a project, it also sends a signal that it trusts the other participants, that they understand one another's strategic cultures enough to agree upon common requirements for the project, and that the state believes the project is viable and valuable. Second, I assess whether OCCAR and the EDA are playing a greater role in PESCO's projects over time. Delegating the agency or OCCAR to manage a project is an act of trust by a member state, because it introduces yet more voices and layers to the project. However, it is a justified act of trust given the two-decades of experience managing collaborative projects and interfacing between industry and the pMS at OCCAR and EDA. If PESCO and the EDF are stimulating more cooperation, then the number of projects adding members should rise with each round and OCCAR and the EDA should manage more projects.

Beginning with project membership, around four projects added members on-net each round between rounds one and four. The rate at which cooperation grows is not increasing, though, it remains steady. PMS continue to join projects from earlier rounds, which aligns with my earlier suggestion that pMS' trust in PESCO and familiarity in its processes is growing. Round five offers a glimmer of hope: on-net, 12 projects added members. For context, round four launched in 2021 and round five in 2023, in the intervening two years, Russia's second invasion of Ukraine has made the unthinkable, thinkable. The EU has shifted from merely funding the R&D of weapons systems, to funding multiple efforts to jointly procurement ammunition to backfill member states depots after they emptied them to support Ukraine.¹²⁴

¹²⁴ Those are EDIRPA and the EDA's Collaborative Procurement of Ammunition project.

European Commission, "EU budget 2024: Enabling Europe to address its priorities," June 7, 2023, https://ec.europa.eu/commission/presscorner/detail/en/IP_23_3062.

European Defense Agency, "EDA brings together 25 countries for Common Procurement of Ammunition," March 20, 2023, <https://eda.europa.eu/news-and-events/news/2023/03/20/eda-brings-together-18-countries-for-common-procurement-of-ammunition>.

Whether PESCO benefits from this pro-collaboration trend will be revealed in 2025, when the next round of projects is scheduled to launch.

EDA and OCCAR paint a similarly mixed picture around the quantity of cooperation. Both organizations play a role in only a fraction of PESCO's projects. Note, EDA and OCCAR do not manage PESCO projects per se, they manage EDF-funded projects associated with a particular PESCO project. The EDA manages three PESCO projects and has supported 10 others with expertise and/or administrative resources. The EDA's role has grown from three projects each from rounds one and two, to seven projects from round three, and two projects from round four. Like the burst of projects adding members in round five, the wave of round three projects seeking EDA support may be a blip. OCCAR manages six PESCO projects, three of which were OCCAR-managed long before PESCO existed; their rebranding as PESCO projects too qualified them for extra EDF funding. Of the other three PESCO projects delegated to OCCAR, TWISTER and the European Patrol Corvette are typical of OCCAR projects in terms of size. TWISTER is studying and designing two ballistic missile interceptors and the EPC is prototyping and, hopefully, jointly procuring multiple corvettes. The other PESCO project, Airborne Electronic Attack (AEA), which is building a new electronic warfare pod to be integrated onto existing aircraft, is a smaller system and a smaller budget, €51.5 million, than usual for OCCAR. Typically, the organization managed a handful of large, complicated projects, but in 2023, OCCAR created a small programs division. This could allow it to better manage more projects that fall between the multi-hundreds of millions of Euro projects like TWISTER, and projects worth tens of millions of Euros. OCCAR is adapting to PESCO and the EDF, but whether more PESCO projects take advantage of the new division is unclear. The EDA and

OCCAR's role in PESCO corroborates my findings around projects' membership: quantity of cooperation's rate of growth is not increasing.

SECTION 4.4: INTERIM CONCLUSIONS

In sum, it's unclear if the accountability brought by the EDF and the structure of PESCO have kick started a positive feedback loop of deeper cooperation. Both organizations have clearly eased the difficulties of cooperation. As expected, PESCO and the EDF's projects comprehensively correspond to the CDP's priority areas. Nor is this merely superficial, both organizations have launched projects in response to CARD's identification of the most needed capabilities. As expected, EU funding and the oversight requirements it brings have succeeded in holding PESCO projects to account. Projects without EU funding are far likelier to be stagnant, unclear, or closed. Contrary to my expectations, lowering the bar to cooperation has not kick-started a positive feedback loop of additional cooperation. Too few projects see membership growth and OCCAR and the EDA manage too few projects. However, the quality of cooperation within PESCO has improved as pMS entrust more ambitious projects to the organization.

CHAPTER 5: CONCLUSION

This thesis began with a two-part question: how has past armaments cooperation affected the structures and products of the EU's current attempts at armaments cooperation? In response to this question, I formulated a series of expectations for PESCO and the EDF's organizational design and performance.

Beginning with design, I compared the two organizations' mandate, membership structure, resources, and representation of various constituencies to past organizations, ranging from the IEPG of the 1960's to their older siblings, the EDA and OCCAR. On mandate, both PESCO and the EDF displayed a middling degree of path dependency. They differed only in the details with the EDA and OCCAR. On membership too, PESCO bore significant similarities to OCCAR and the EDA's layered membership structure that allowed states to choose the degree of cooperation with which they felt most comfortable. The Commission takes advantage of this structure when the EDF funds projects managed by OCCAR or EDA; then the Commission gets a say in the project's management. In membership and in representation, the EDA breaks from the path. Unique among armaments organizations, supranational bureaucrats in the Commission select the industry consortium to build EDF-funded projects. Member states only have indirect influence over the EDF, whereas PESCO adopts armaments organizations' traditional intergovernmental governance. Here too, PESCO displays a middling degree of path dependency. Concluding with resources, PESCO and the EDF improve upon OCCAR and EDA because they can rely on those two organizations' decades of institutional knowledge, and on the

EDF's budget to promote cooperation. Together these four organizations form a web of cooperation, where each organization has a role to play in the process of armaments development. PESCO proposes, EDF incentivizes, EDA provides guidance, and OCCAR manages the transition from R&D to production and procurement. From this basis, I formulated my three expectations for PESCO and the EDF performance.

First, their projects should better take into account European priorities. By cross-referencing their projects against the CDP's priority areas, I find that PESCO and the EDF have a comprehensive list of projects. Each time that CARD recommended more ambitious opportunities for collaboration, PESCO and the EDF launched and funded projects in response. Neither side of this process – the planning documents or the co-development mechanisms – are perfect though. Unlike NATO's planning process, neither CARD nor the CDP are a true force structure, i.e., what a military should look like to accomplish the tasks set for it. This limits their usefulness as planning documents for guiding the EDF and PESCO. On the co-development side, PESCO does not include two of Europe's most ambitious co-development projects: the Franco-German-Spanish development of a sixth-generation fighter jet, FCAS, and the Franco-German development of a new tank. However, both projects are caught up in fights over workshares, which illustrates how far armaments cooperation has come since the 20th century, when such fights were a baked-in feature.¹²⁵

Second, PESCO projects with EU funding should demonstrate more progress than projects without EU funding. An exhaustive open-source search for project factsheets and press releases, or the absence of either, supports my expectation that EU-funding imposes

¹²⁵ Werner, „Geheimer Bericht offenbart den Machtkampf.“

accountability on projects. In the absence of easily accessible budget documents and indirect national legislative oversight of armaments organizations, transparency requirements imposed by the EU shed much needed light on projects worth tens and hundreds of millions of Euros. Without comparable transparency, PESCO projects without EU funding can easily avoid the limelight. The Council's conclusions avoid naming and shaming projects publicly, leaving the public to hope that behind closed doors member states and PESCO's secretariat are honest with one another when projects inevitably go awry. Failing to close stagnant projects quickly, and failing to publicize all projects' progress towards their goals leaves a gap in the record that allows doubt to be cast on PESCO and the worth of armaments cooperation writ large.

Third, the costs of cooperation should sink, thereby begetting more cooperation. As European priorities layer atop national ones, they should ease the harmonization of states' conflicting requirements. With EDF funding and growing familiarity with PESCO's processes, other defense ministries, and the EDA, cooperation should grow less daunting and more fruitful over time. My findings contradict that story.

Projects added members at a steady rate between rounds one and four; there is no indication of the rate increasing. The limited pool of 69 active PESCO projects, does not explain the lack of growth, excepting France, Germany, Italy, and Spain, who have participated in the most projects. Many states have only joined a few projects. Consider Ireland, which initially joined one round-one PESCO project; only in round five in 2023, after Russia's second invasion of Ukraine, did Ireland join three additional projects. A likely explanation for limited membership growth is inertia. After the initial excitement at PESCO's launch, overburdened, underfunded defense ministries across the EU lacked the bandwidth or the political support to commit to still-nascent co-development projects. As with Ireland, the geopolitical shock of

Russia's second invasion in 2022, may have revived that support. 12 projects added members in the fifth round, but the next round launches in 2025 which is plenty of time for states to normalize the tense geopolitical situation. In between the third and fourth rounds, PESCO updated projects' membership in 2020; a similar move in 2024 could maintain cooperation's momentum.

My two other metrics for increasing cooperation – the ambition of PESCO's projects and the role of OCCAR and the EDA – delivered a comparable story to projects' membership. OCCAR is adapting to better manage mid-sized projects, which represent the majority of PESCO's projects, and the EDA provided more support, albeit often in the form of low stakes administrative and consultative support, to third-round projects than first or second-round ones. The EDA's burst of supported projects in round three mirrors the rise of PESCO's ambitions: a smaller share of third-round projects received a larger amount of EU funding than earlier rounds. As with membership, there is no trend in the data, merely an initial growth which could easily be trampled in the years to come.

This thesis demonstrates that PESCO and the EDF are successful instruments of armaments cooperation: they have improved upon their predecessors and made cooperation more beneficial. They have demonstrated their staying power and continued relevance as a topic of study, rather than, as was feared in 2017, a flash in the pan. Their durability aside, the recent developments discussed earlier in the conclusion raise the question, where do PESCO and the EDF go from here?

To answer that question, more research is needed. This thesis avoided analyzing the composition and backgrounds of the industrial consortiums implementing each EU-funded project. It also avoided analyzing the shifting constellations of participating member states in

each PESCO project. An analysis synthesizing those two topics would provide greater insight into the industrial, military, and political motives behind projects, as well as shed light on another dimension of the relationship between member states. With a greater understanding of motives and member state dynamics, future research could more easily identify opportunities for collaboration. There will undoubtedly be more projects to come from PESCO, and the EDF has already opened its 2023 work program for submission: European defense is integrating.

APPENDIX 1: LIST OF PESCO'S PROJECTS AND THEIR ACRONYMS

Table 2 – PESCO's Projects and Their Acronyms	
Project Title	Acronym
Round One	
European Medical Command	EMC
European Secure Software defined Radio	ESSOR
Network of logistic Hubs in Europe and support to Operations	NetLogHubs
Military Mobility	N/A
European Union Training Mission Competence Center	EU TMCC
European Training Certification Center for European Armies	ETCCEA
Energy Operational Function	EOF
Deployable Military Disaster Relief Capability Package	DM-DRCP
Maritime (semi-) Autonomous Systems for Mine Countermeasures	MAS MCM
Harbor and Maritime Surveillance and Protection	HARMSPRO
Upgrade of Maritime Surveillance	UMS
Cyber threats and Incident Response Information Sharing Platform	CTISP or CTIRISP
Cyber Rapid Response Teams and Mutual Assistance in Cyber Security	CRRT
Strategic Command Control (C2) System for CSDP Missions and Operations	EUMILCOM or ESC2
Armoured Infantry Fighting Vehicle / Amphibious Assault Vehicle / Light Armoured Vehicle	AIFV/AAV/LAV
Indirect Fire Support	EuroArtillery
EUFOR Crisis Response Operation Core	EUFOR CROC
Round Two	
Helicopter Hot and High Training	H3 Training
Joint EU Intelligence School	JEIS
EU Test and Evaluation Centres	EUTEC
Integrated Unmanned Ground System	iUGS
EU Beyond Line Of Sight (BLOS) Land Battlefield Missile Systems	BLOS
Deployable Modular Underwater Intervention Capability Package	DIVEPACK
European Medium Altitude Long Endurance Remotely Piloted Aircraft System	Eurodrone
European Attack Helicopters TIGER Mark III	TIGER
Counter Unmanned Aerial System	C-UAS
European High Atmosphere Airship Platform (EHAAP) — Persistent Intelligence, Surveillance and Reconnaissance (ISR) Capability	EHAAP

Table 2 – PESCO’s Projects and Their Acronyms

Project Title	Acronym
One Deployable Special Operations Forces (SOF) Tactical Command and Control (C2) Command Post (CP) for Small Joint Operations (SJO) — (SOCC) for SJO	SOC2 for SJO
Electronic Warfare Capability and Interoperability Programme for Future Joint Intelligence, Surveillance and Reconnaissance	JISR
Chemical, Biological, Radiological and Nuclear (CBRN) Surveillance as a Service	CBRN SaaS
Co-basing	N/A
Geo-meteorological and Oceanographic (GeoMETOC) Support Coordination Element	GMSCE
EU Radio Navigation Solution	EURAS
European Military Space Surveillance Awareness Network	EU-SSA-N
Round Three	
Integrated European Joint Training and Simulation Centre	EUROSIM
EU Cyber Academia and Innovation Hub	EU CAIH
Special Operations Forces Medical Training Centre	
Chemical, Biological, Radiological and Nuclear (CBRN) Defence Training Range	CBRNDTR
European Union Network of Diving Centres	EUNDC
Maritime Unmanned Anti-Submarine System	MUSAS
European Patrol Corvette	EPC
Airborne Electronic Attack	AEA
Cyber and Information Domain Coordination Centre	CIDCC
Timely Warning and Interception with Space-based TheatER surveillance	TWISTER
Materials and components for technological EU competitiveness	MAC-EU
EU Collaborative Warfare Capabilities	ECoWAR
European Global Remotely Piloted Aircraft Systems (RPAS) Insertion Architecture System	GLORIA
Round Four	
Medium size Semi-Autonomous Surface Vehicle	M-SASV
Common Hub for Governmental Imagery	CoHGI
Defense of Space Assets	DOsA
Strategic Air Transport for Outsized Cargo	SATOC
Future Medium-size Tactical Cargo	FMTC
Main Battle Tank Simulation and Testing Centre	MBT-SIMTEC
EU Military Partnership	EU MilPart

Table 2 – PESCO’s Projects and Their Acronyms

Project Title	Acronym
Essential Elements of European Escort	4E
Next Generation Small RPAS	NGSR
Rotorcraft Docking Station for Drones	RDSD
Small Scalable Weapons	SSW
Air Power	N/A
Cyber Ranges Federations	CRF
Automated Modelling, Identification and Damage Assessment of Urban Terrain	AMIDA-UT
Round Five	
European Defence Airlift - Training Academy	EDA-TA
Integrated Unmanned Ground Systems 2	iUGS 2
Counter Battery Sensors	CoBaS
Anti-Torpedo Torpedo	ATT
Critical Seabed Infrastructure Protection	CSIP
Future Short-Range Air to Air Missile	FSRM
Next Generation Medium Helicopter	NGMH
Integrated Multi-Layer Air and Missile Defence System	IMLAMD
Arctic Command & Control Effector and Sensor System	ACCESS
Robust Communication Infrastructure and Networks	ROCOMIN
ROLE 2F	N/A

APPENDIX 2: CROSS-REFERENCING PESCO & EDF PROJECTS AGAINST THE CDP PRIORITY AREAS

Note, PESCO and EDF projects can correspond to multiple priority areas. The table of PESCO projects includes cancelled projects and projects that, under the second criteria – progress, fail to demonstrate any progress. In the table of PESCO projects, bolded projects have been closed by the pMS. In the table of EDF Projects, italicized projects correspond to the PESCO project in brackets.

Not all PESCO projects correspond to a priority area: from round one, the Deployable Military Disaster Relief Capability Package (DM-DRCP) and EUFOR Crisis Response Operation Core (EUFOR CROC); from round two, the Joint EU Intelligence School (JEIS) and Helicopter Hot and High Training (H3 Training); from round three, the European Union Network of Diving Centres (EUNDC); from rounds four and five, none. Nor do all EDF projects correspond to a priority area: from PADR-2018, EXCEED, SOLOMON, PYTHIA; from PADR-2019: INTERACT; from EDIDP-2019, FITS4TOP, DRONEDGE-E; from EDIDP-2020, VireTS, FIIST; from EDF-2021, AGAMI_EURIGAMI; ABITS; POWERPACK; POWERFLEX; HEGAPS; HEROIC; from EDF-2022, FEDERATES [associated with EUROSIM and MBT-SIMTEC], EOA, HiTDOC.

Table 3 – PESCO Projects Cross-Referenced against the CDP Priority Areas

Priority	Areas	Round One		Round Two		Round Three		Round Four		Round Five	
		R&T	R&D	R&T	R&D	R&T	R&D	R&T	R&D	R&T	R&D
Cyber Responsive Operations	Cyber cooperation and synergies	-	CRRT, CTISP	-	-	ECoWAR	EU CAIH, CIDCC	-	CRF	-	-
	Cyber research and technology	-	-	-	-	-	-	-	CRF	-	-
	Systems engineering framework for cyber operations	-	CRRT, CTISP	-	-	-	CIDCC	-	-	-	-
	Cyber education and training	-	-	-	-	-	EU CAIH	-	CRF	-	-
	Specific cyber defense challenges in the air, space maritime and land domain	-	-	JISR	UGS	-	EUROSIM	4E	AMIDA-UT	IMLAM D	iUGS2
Space-Based Information and Communication Services	Earth Observation	-	-	-	-	-	-	-	CoHGI	-	-
	Positioning, navigation and timing	-	-	-	EURAS	-	-	-	-	-	-
	Space situation awareness	-	-	-	EU-SSA-N	-	TWISTER	DoSA	-	-	-
	Satellite communication	-	-	-	-	-	-	-	CoHGI	-	-
Information Superiority	Radio spectrum management	-	-	JISR	-	ECoWAR	-	-	-	-	-
	Tactical CIS	-	ESSOR	-	-	-	-	4E	AMIDA-UT	ROCOM IN, IMLAM D, ACCESS	CoBaS
	Information management	-	EUMILCOM	-	GMSCE	-	CIDCC	-	CoHGI	-	-
	Intelligence, Surveillance and	-	-	-	EHAAP, SOC2	-	-	-	NGSR, RDS, D	-	-

Table 3 – PESCO Projects Cross-Referenced against the CDP Priority Areas

Priority	Areas	Round One		Round Two		Round Three		Round Four		Round Five	
		R&T	R&D	R&T	R&D	R&T	R&D	R&T	R&D	R&T	R&D
	Reconnaissance (ISR) capabilities	-	HARMS PRO	JISR	for SJO, iUGS	ECoWA R	-	4E	AMIDA-UT	ACCESS	CoBaS, iUGS2
Ground Combat Capabilities	Upgrade, modernize and develop land platforms (manned/unmanned vehicles, precision strike)	-	AIFV/A AV/LAV, EuroArtillery	-	iUGS, BLOS	-	-	-	MBT-SIMTEC, NGSR, SSW	-	CoBaS, iUGS2
	Enhanced protection of forces (CBRN, CIED, individual soldier equipment)	-	AIFV/A AV/LAV	-	CBRNSa aS, C-UAS	-	CBRND TR	-	-	-	-
Enhanced Logistic and Medical Supporting Capabilities	Military Mobility	-	Military Mobility, AIFV/A AV/LAV	-	-	-	-	-	-	-	-
	Enhanced logistics	EOF	NetLogHubs	-	Co-basing	-	-	-	-	-	-
	Medical support	-	EMC	-	-	-	SMTC	-	-	ROLE 2F	-
Naval Maneuverability	Maritime situational awareness	-	UMS	-	DIVEPA CK	-	-	-	NGSR	CSIP	-
	Surface superiority	-	MAS MCM	-	-	-	EPC	4E	M-SASV	-	-
	Power projection	-	-	-	Co-basing, DIVEPA CK	-	MUSAS, EPC	4E	M-SASV	-	ATT
Underwater Control Contributing to Resilience at Sea	Mine warfare	-	MAS MCM, HARMS PRO	-	-	-	EPC	-	-	-	-
	Anti-submarine warfare	-	-	-	-	-	MUSAS	-	-	-	ATT

Table 3 – PESCO Projects Cross-Referenced against the CDP Priority Areas

Priority	Areas	Round One		Round Two		Round Three		Round Four		Round Five	
		R&T	R&D	R&T	R&D	R&T	R&D	R&T	R&D	R&T	R&D
	Harbour protection	-	HARMS PRO	-	-	-	-	-	-	CSIP	-
Air Superiority	Air combat capability	-	-	-	-	-	AEA	Air Power	-	NGMH, IMLAM D, FSRM	-
	Air ISR platforms	-	-	JISR	Eurodron e, TIGER, EHAAP	-	-	-	NGSR, RDSD	-	-
	Anti-Access Area Denial (A2/AD) capability	-	-	-	-	-	-	-	-	IMLAM D	-
	Air-to-air refueling	-	-	-	-	-	-	-	-	-	-
	Ballistic Missile Defence (BMD)	-	-	-	-	-	TWISTE R	-	-	-	-
Air Mobility	Strategic air transport	-	-	-	-	-	-	SATOC	-	-	EDA-TA
	Tactical air transport including air medical evacuation	-	-	-	-	-	-	-	FMTC	NGMH	EDA-TA
Integration of Military Air Capabilities in a Changing Aviation Sector	Military access to airspace	-	-	-	-	-	AEA, GLORIA	-	-	-	-
	Ability to protect confidentiality of mission critical information	-	CRRT, CTISP	-	-	-	CIDCC	-	-	ROCOM IN	-
	Coordination with civilian aviation authorities	-	-	-	-	-	AEA, GLORIA	-	-	-	-
	Adaptation of military air/space C2 capability	-	EUMIL COM	-	-	-	GLORIA	-	-	IMLAM D	-

Table 3 – PESCO Projects Cross-Referenced against the CDP Priority Areas

Priority	Areas	Round One		Round Two		Round Three		Round Four		Round Five	
		R&T	R&D	R&T	R&D	R&T	R&D	R&T	R&D	R&T	R&D
Cross-Domain Capabilities Contributing to Achieve the EU's Level of Ambition	Innovative technologies for enhanced future military capabilities	N/A	N/A	-	-	MAC-EU	-	-	-	-	-
	Autonomous EU capacity to test and to qualify EU developed capabilities	-	-	-	EU Test and Evaluation Centres	-	CBRND TR, GLORIA	-	MBT-SIMTEC	-	EDA-TA
	Enabling capabilities to operate autonomously within EU's LoA	-	EUMIL COM, ETCCE A	-	DIVEPA CK, SOC2 for SJO	ECoWA R	EPC	SATOC	EU MilPart, M-SASV, FMTC, CoHGI	ROCOM IN, ACCESS	-

Table 4 – EU-Funded Projects Cross-Referenced against the CDP Priority Areas

Priority	Areas	PADR 2017-2019		EDIDP 2019-2020		EDF 2021		EDF 2022	
		R&T	R&T	R&D	R&T	R&D	R&T	R&D	
Cyber Responsive Operations	Cyber cooperation and synergies	-	ECYSAP [EUMILCOM]	PANDORA [CTISP]; CYBER4DE [CRRT]	EU-GUARDIAN [EUMILCOM]; EDOCC [ECoWAR]	ACTING [EU CAIH]	STORE	FACT [CTIRISP]; EUCINF [CIDCC]	
	Cyber research and technology	-	-	-	AIception; KOIOS; FaRADAI; ALADAN	-	STORE; NEWSROOM	HARTROID	
	Systems engineering framework for cyber operations	-	ECYSAP [EUMILCOM]	PANDORA [CTISP]; CYBER4DE [CRRT]	EU-GUARDIAN [EUMILCOM]	-	-	EUCINF [CIDCC]	
	Cyber education and training	-	-	-	-	ACTING [EU CAIH]	-	-	
	Specific cyber defense challenges in the air, space maritime and land domain	PRIVILEGE	HERMES	PEONEER; iMUGS [UGS]; DECISMAR [UMS]; AI4DEF	TeChBioT; EDINAF; dTHOR; IntSen2;	SMiEQ	EAGLES; UTILE; HARTROID; TIRESYAS; CONVOY; AIDEDex	TRAVISMOS	
Space-Based Information and Communication Services	Earth Observation	-	OPTISSE; NEMOS	PEONEER	IntSen2	Navguard [EURAS]	SPIDER [CoHGI]		
	Positioning, navigation and timing	OPTIMISE	-	GEODE [EURAS];	Q-SiNG				
	Space situation awareness	-	ODIN's EYE	SAURON [EU-SSA-N]; INTEGRAL [EU-SSA-N]	SPRING	NAUCRATES [EU-SSA-N]			
	Satellite communication	-	-	-	EPW	RFSHIELD; Mini-BOT; Navguard [EURAS]	REACTS		
Information Superiority	Radio spectrum management	CROWN, PRIVILEGE	SMOTANET	-	ARTURO	ALTISS; RFSHIELD; HIDRA;			

Table 4 – EU-Funded Projects Cross-Referenced against the CDP Priority Areas

Priority	Areas	PADR 2017-2019		EDIDP 2019-2020		EDF 2021		EDF 2022	
		R&T	R&T	R&D	R&T	R&D	R&T	R&D	
						<i>Navguard</i> [EURAS]			
	Tactical CIS	-	SMOTANET; ESSOR [ESSOR]	DISCRETION [EU CAIH]	-	5G COMPAD; P2P-FSO		LATAACC [ECoWAR]	
	Information management	-	ESC2 [EUMILCOM]; ECYSAP [EUMILCOM]	-	-	SDMMS		PROTEAS [SOC2 for SJO]; EC2 [EUMILCOM]; LATAACC [ECoWAR]	
	Intelligence, Surveillance and Reconnaissance (ISR) capabilities	SPINAR	MALE RPAS [Eurodrone]	LOTUS; iMUGS [UGS]; SIGNAL; PADIC [HARMSPRO]; CBRN-RSS [CBRNSaaS]	-	5G COMPAD; EuroHAPS [EHAAP]; HYBRID; ALTISS; HIDRA; SEAWINGS	CASSATA; TIRESYAS	E-NACSOS [ECoWAR]	
Ground Combat Capabilities	Upgrade, modernize and develop land platforms (manned/unmanned vehicles, precision strike)	ARTUS; PILUM	FIRES [EuroArtillery]; FAMOUS; e-COLORSS [EuroArtillery]	LYNKEUs [BLOS]; iMUGS [UGS]; SRB	NEWHEAT	MARSEUS [BLOS-continuation of LYNKEUs]; FAMOUS2 (continuation of FAMOUS); COMMANDS [UGS]; SHOLFEA	THEMA		
	Enhanced protection of forces (CBRN, CIED, individual soldier equipment)	AIDED; GOSSRA; VESTLIFE; ACAMSII	JEY-CUAS [C-UAS]	VERTigO [CBRNDTR]; CBRN-RSS [CBRNSaaS]	ECOBALLIFE; TeChBioT; MoSaiC; LODESTAR (continuation	COUNTERACT [EMC]	UTILE; ACROSS; TICHE; DeterMine;	WEMOR; TRAVISMOS; ; ARMETISS	

Table 4 – EU-Funded Projects Cross-Referenced against the CDP Priority Areas

Priority	Areas	PADR 2017-2019		EDIDP 2019-2020		EDF 2021		EDF 2022	
		R&T	R&T	R&D	R&T	R&D	R&T	R&D	
					of GOSSRA); Nano-SHIELD; ACHILE [ECoWAR, continuation of GOSSRA]			CONVOY; AIDEDex	
Enhanced Logistic and Medical Supporting Capabilities	Military Mobility	-	-	-	-	SDMMS		FASETT	
	Enhanced logistics	-	-	-	INDY [EOF]	NOMAD [EOF]		DISCMAM	
	Medical support	ARTUS	-	-	-	COUNTERACT [EMC]		iMEDCAP	
Naval Maneuverability	Maritime situational awareness	OCEAN2020	NEMOS	DECISMAR [UMS]; USSPS; CUIS [DIVEPACK; EUNDC]	iFURTHER; Q-SiNG	SEAWINGS; FIBERSENSE		SWAT-SHOAL; SCUALE	PASITHEA; EUROGUARD [M-SASV]; E-NACSOS [ECoWAR]
	Surface superiority	-	-	-	EPC [EPC]; EDINAF	-		EUROGUARD [M-SASV]	
	Power projection	-	SEA DEFENCE; TRANSFLYTOR	-	EPC [EPC]; dTHOR	-			
Underwater Control Contributing to Resilience at Sea	Mine warfare	-	-	MIRICLE [MAS MCM]	EPC [EPC]	-			
	Anti-submarine warfare	-	-	SEANICE [MUSAS];	-	-		SWAT-SHOAL	
	Harbour protection	-	-	PADIC [HARMSPRO]	-	-			
Air Superiority	Air combat capability	-	REACT [AEA]; CARMENTA	-	EPIIC [Air Power]; EICACS [Air Power];	-		REACTII [AEA]	

Table 4 – EU-Funded Projects Cross-Referenced against the CDP Priority Areas

Priority	Areas	PADR 2017-2019		EDIDP 2019-2020		EDF 2021		EDF 2022	
		R&T	R&T	R&D	R&T	R&D	R&T	R&D	
					ENGRT; NEUMANN; AMLTD				
	Air ISR platforms	-	MALE RPAS [Eurodrone];	LOTUS; SIGNAL	iFURTHER; Facelift;	EuroHAPS [EHAAP]; HYBRID; ALTISS; SEAWINGS	EAGLES	PASITHEA	
	Anti-Access Area Denial (A2/AD) capability	-	-	-	-	-			
	Air-to-air refueling	-	-	-	-	-			
	Ballistic Missile Defence (BMD)	-	-	-	EU HYDEF [TWISTER]	-	ODIN's EYE II [TWISTER]		
Air Mobility	Strategic air transport	-	-	-	-	-			
	Tactical air transport including air medical evacuation	-	-	-	ENGRT	-	FASETT		
Integration of Military Air Capabilities in a Changing Aviation Sector	Military access to airspace	-	-	EUDAAS [Eurodrone]	Q-SiNG	-		SESIOP	
	Ability to protect confidentiality of mission critical information	-	-	PANDORA [CTISP]	-	-			
	Coordination with civilian aviation authorities	-	-	EUDAAS [Eurodrone]; MUSHER [ECoWAR]				SESIOP	
	Adaptation of military air/space C2 capability	-	ESC2 [EUMILCOM]	EUDAAS [Eurodrone]			EAGLES	EC2 [EUMILCOM]	

Table 4 – EU-Funded Projects Cross-Referenced against the CDP Priority Areas

Priority	Areas	PADR 2017-2019		EDIDP 2019-2020		EDF 2021		EDF 2022	
		R&T	R&T	R&D	R&T	R&D	R&T	R&D	
		Cross-Domain Capabilities Contributing to Achieve the EU’s Level of Ambition	Innovative technologies for enhanced future military capabilities	METAMASK ; QUANTUM; TALOS	-	-	ENLIGHTEN ; ADEQUADE	ROLIAC	TDRIC; EPICURE; SCUALE
Autonomous EU capacity to test and to qualify EU developed capabilities	-		-	-		<i>NOMAD</i> [EOF]	SILENT	<i>FACT</i> [CTIRISP]	
Enabling capabilities to operate autonomously within EU’s LoA	-		<i>ESC2</i> [EUMILCOM]; <i>ECYSAP</i> [EUMILCOM];	-	<i>EU-GUARDIAN</i> [EUMILCOM]; <i>INDY</i> [EOF]; <i>EPC</i> [EPC];	<i>COUNTERACT</i> [EMC]		<i>PROTEAS</i> [SOC2 for SJO]; <i>EC2</i> [EUMILCOM]; <i>LATACC</i> [ECoWAR]	

APPENDIX 3: STIMULATING COOPERATION

Note, the following table's funding amounts are in millions of Euros. The 2023 EDF Indicative Multiannual Perspective foresees allocating €238 million to the EPC and TWISTER.¹²⁶

Table 5 – EU Funded Projects and PESCO								
	2019, 2020 EDIDP		2021 EDF		2022 EDF		Total (2019-2022)	
	Projects	Budget	Projects	Budget	Projects	Budget	Projects	Budget
Total	44	€500	60	€1,167	41	€832	145	€1,999
Share of EU-Funded Projects Associated and Allocated to PESCO Projects								
Total	23	€353.05	15	€548.3	11	€482.7	49	€1,384
Share	53%	71%	25%	59%	27%	58%	33%	69%
Round 1	10	€109.75	4	€96.2	2	€56.9	16	€262.85
Round 2	9	€219.4	5	€121.1	1	€19.9	15	€360.4
Round 3	4	€23.9	5	€256.1	6	€306	15	€586
Round 4	N/A	N/A	1	€74.9	2	€99.9	3	€174.8 (+ €238 projected)

Table 6 – Net Total PESCO Projects that Added Members, per round					
	Round Two	Round Three	2020	Round 4	Round 5
Net Total:	4	5	5	4	12

¹²⁶ European Commission, *the adoption of the work programme for 2023 - Part II*, https://defence-industry-space.ec.europa.eu/eu-defence-industry/european-defence-fund-edf_en, pages 27-30;

Table 7 – PESCO Projects’ Development												
Round	When:	Round 2: 2018	Round 3: 2019	2020	Round 4: 2021	Round 5: 2023	Cumulative					
One	Operational by	-	-	-	-	EMC	Grew	EMC CRRT NetLogHubs EOF DM-DRCP MAS MCM CTISP CRRT EUFOR CROC	9			
	Added	NetLogHubs MAS MCM HARMSPRO CRRT EUMILCOM	EMC CRRT EUMILCOM	EMC MAS MCM UMS	EMC EOF EUFOR CROC	NetLogHubs DM-DRCP MAS MCM CTISP CRRT EUFOR CROC						
	Removed	HARMSPRO	CRRT	CTISP CRRT	CTISP	ESSOR				Shrank	ESSOR CTISP	2
	Closed	-	-	EU TMCC	-	EuroArtillery				Closed	EU TMCC EuroArtillery	2
When:		Round 3: 2019	2020	Round 4: 2021	Round 5: 2023	Cumulative						
Two	Grew	GMSCE EURAS iUGS	DIVEPACK EU-SSA-N	GMSCE	DIVEPACK BLOS C-UAS JISR	Grew	BLOS DIVEPACK C-UAS JISR GMSCE EURAS EU-SSA-N	7				
	Shrank	-	-	-	iUGS				Shrank	iUGS	1	
	Closed	-	-	-	EUTECH Co-basing				Closed	EUTECH Co-basing	2	
When:		2020	Round 4 - 2021	Round 5 - 2023	Cumulative							
Three	Grew	EPC TWISTER ECoWAR	CIDCC MAC-EU	EPC EU CAIH	Grew	EU CAIH EPC TWISTER MAC-EU	4					
	Shrank	CIDCC	CIDCC	ECoWAR				Shrank	CIDCC	1		
When:		Round 5				Cumulative						
Round 4	Grew	NGSR, FMTC, AMIDA-UT, DoSA				Grew	4					
	Shrank	SATOC				Shrank	1					

APPENDIX 4: ROUNDS ONE PESCO PROJECTS' PROGRESS

Each table lists: projects' purpose per, either their description as of the fifth round or, for closed projects, their original description; their original members with the coordinator italicized and, when applicable membership changes by round; whether the project grew, shrank, or remained stable; evidence for their progress or lack thereof; when available, their response to the IISS survey (either, a date, no date [n.d. in the table], or no response [n.r. in the table]) and appearance in the 2020 Strategic Review; and my categorization of the project according to my typology – see Figure 1. When applicable, the table also lists associated EU-funded projects and their worth in millions.

Table 8 – European Medical Command (EMC)					
Members			Purpose	EDF 2021	
Original	<i>Germany</i>	Netherlands	Italy	To enable operations by increasing the readiness of medical personnel.	COUNTERACT
	Czechia	Romania	France		Worth
	Sweden	Slovakia	Spain		€49.0
Additions	Third-Round:		Belgium	Evidence • Operational as of May 2022. ¹²⁷ • COUNTERACT aims to build a network within the EU to develop and deploy countermeasures against CBRN threats. ¹²⁸ ○ Not funding to establish the EMC.	
	2020:	Poland	Estonia Hungary		
	Fourth-Round:		Luxemburg		
Result	Grew				
Timelines	IISS	Strategic Review (by 2025)		Operational or Closed	
	n.d.	Yes		Yes, operational	
Categorization	not EU-funded, pMS implemented, operational.				

¹²⁷ European Union, PESCO, “European Medical Command Project Now Operational,” July 5, 2022, <https://www.pesco.europa.eu/pressmedia/european-medical-command-project-now-operational/>.

“Multinational Medical Coordination Centre / European Medical Command,” Bundeswehr, Federal Republic of Germany, accessed June 10, 2023, <https://www.bundeswehr.de/en/organization/bundeswehr-medical-service-/mmcc-emc->.

¹²⁸ European Commission, European Defense Fund, *COUNTERACT*, July 20, 2022, https://defence-industry-space.ec.europa.eu/funding-and-grants/calls-proposals/european-defence-fund-2021-calls-proposals-results_en#summary-of-edf-2021-selected-projects---factsheet.

Table 9 – European Secure Software defined Radio (ESSOR)					
Members			Purpose	EDIDP	Worth
Original	Portugal Belgium Germany Netherlands	Poland <i>France</i> Finland Italy	Develop common technology for European radios to enable interoperability.	Direct award ¹²⁹	€34.65
Fifth-Round Removal		Belgium	Evidence		
Result		Shrank	<ul style="list-style-type: none"> Implemented by OCCAR since 2010 – pMS in PESCO’s ESSOR differ from OCCAR’s.¹³⁰ The pMS selected the EDA to develop the concept of operations for ESSOR.¹³¹ EDIDP award runs for a 36-month period. 		
Timelines		IISS	Strategic Review (by 2025)	Operational or Closed	
		-	Yes	-	
Categorization		EU-funded, OCCAR implemented, defined end-date and outputs, on-time.			
Table 10 – NetLogHubs					
Members			Purpose		
Original	<i>Germany</i> Belgium Bulgaria France Croatia	Italy Cyprus Spain Greece	Hungary Netherlands Slovenia Slovakia	Network of existing logistics depots to allow mutual use, harmonize pMS’ transport and deployment activities, and allow common storage.	
Second-Round Addition		Poland	Evidence		
Fifth-Round Addition		Lithuania	<ul style="list-style-type: none"> Expected full operational capability in 2024, initial capability in 2020.¹³² <ul style="list-style-type: none"> Other pMS have established hubs.¹³³ 		
Result		Grew			
Timelines		IISS	Strategic Review (by 2025)	Operational or Closed	
		2020	Yes	-	
Categorization		Not EU-funded, pMS implemented, defined end-date and outputs, on-time.			

¹²⁹ European Defense Industrial Development Program, *ESSOR*.

¹³⁰ “ESSOR - European Secure Software Defined Radio,” OCCAR, accessed June 10, 2023, <https://www.occar.int/programmes/essor?page=0#news>.

¹³¹ European Defense Agency, “Helping hands,” November 2020, <https://eda.europa.eu/webzine/issue20/cover-story/helping-hands>.

¹³² “Network of LogHubs Logistic Hubs in Europe and Support to Operations,” Bundesministerium der Verteidigung, Federal Republic of Germany, accessed June 11, 2023, <https://www.bmvg.de/de/themen/sicherheitspolitik/gsvp-sicherheits-verteidigungspolitik-eu/network-of-loghubs-in-europe-and-support-operations-pesco-projek-263578>.

Bundesministerium der Verteidigung, “Europäische Verteidigung: Neuer logistischer Knotenpunkt,” November 17, 2020, <https://www.bmvg.de/de/aktuelles/europaeische-verteidigung-neuer-logistischer-knotenpunkt-4472698>.

¹³³ Julia Weigelt, “Am Ende zählt, was auf dem Hof steht,” *loyal*, March 25, 2021, <https://www.reservistenverband.de/magazin-loyal/am-ende-zaehlt-was-auf-dem-hof-steht/>.

Table 11 – Military Mobility				
Members				Purpose
Original	<i>Netherlands</i>	Estonia	Spain	To enable unrestricted rapid movement of military assets and personnel within the EU by cutting bureaucratic red-tape and improving infrastructure.
	Belgium	Greece	France	
	Bulgaria	Cyprus	Croatia	Evidence <ul style="list-style-type: none"> • Commission coordinates pMS’ military mobility work. • Two action plans published and three progress reports.¹³⁴ • Commission’s proposed 2024-budget has €241 million for military mobility.¹³⁵
	Germany	Czechia	Italy	
	Luxembourg	Lithuania	Poland	
	g	a	Austria	
	Portugal	Hungary	Finland	
	Slovenia	Romania	Latvia	
Sweden	a			
	Slovakia			
Result	Stable			
Timelines	IISS	Strategic Review (by 2025)		Operational or Closed
	n.r.	Yes		-
Categorization	EU-funded, Commission-implemented, on-time.			

¹³⁴ European Defense Agency, “Military Mobility: EU proposes actions to allow armed forces to move faster and better across borders,” November 10, 2022, <https://eda.europa.eu/news-and-events/news/2022/11/10/military-mobility-eu-proposes-actions-to-allow-armed-forces-to-move-faster-and-better-across-borders.;>

European Commission, “Defence Union: further progress made towards military mobility in the EU,” September 27, 2021, https://defence-industry-space.ec.europa.eu/defence-union-further-progress-made-towards-military-mobility-eu-2021-09-27_en.

¹³⁵ European Commission, “EU budget 2024.”

Table 12 – European Union Training Mission Competence Center (EU TMCC)			
Members		Purpose	
Original	<i>Germany</i>	Luxembourg	A center “to improve the availability, interoperability, specific skills and professionalism of personnel involved in EU Training Missions.”
	<i>Belgium</i>	Netherlands	
Original	<i>Czechia</i>	Romania	<p style="text-align: center;">Evidence</p> <ul style="list-style-type: none"> • Closed in November 2020.¹³⁶ • pMS realized that the EU TMCC duplicated existing structures; this process resulted in recommendations on improving those existing structures to improve personnel’s training.¹³⁷
	<i>Ireland</i>	Sweden	
	<i>Austria</i>	Italy	
	<i>France</i>	Cyprus	
	<i>Spain</i>		
Result	N/A		
Timelines	IISS	Strategic Review (by 2025)	Operational or Closed
	n.d.	No	Yes, closed
Categorization	Not EU-funded, pMS implemented, closed.		

Table 13 – European Training Certification Center for European Armies (ETCCEA)			
Members		Purpose	
Original	<i>Italy</i>	To standardize procedures among European allies and allow staff to practice command and control tasks at various levels.	
	<i>Greece</i>		
Result	Stable	Evidence	
		<ul style="list-style-type: none"> • No evidence of progress on the Italian defense ministry website, though it is not reliant on industry support given that it likely builds on existing member state capabilities. 	
Timelines	IISS	Strategic Review (by 2025)	Operational or Closed
	n.r.	No	-
Categorization	not EU-funded, pMS implemented, stagnant.		

¹³⁶ Council Decision (CFSP) no. 2020/1746 (amending and updating Decision (CFSP) 2018/340 establishing the list of projects to be developed under PESCO), November 23, 2020, OJ L 393/12, Preamble, Section 10, <http://data.europa.eu/eli/dec/2020/1746/oj>.

¹³⁷ “[CLOSED] European Union Training Mission Competence Centre (EU TMCC),” PESCO, European Union, accessed May 27, 2023, <https://www.pesco.europa.eu/project/european-union-training-mission-competence-centre/>.

Table 14 – Energy Operational Function (EOF)					
Members		Purpose		EDF 2021	Worth
Original	France Belgium Spain Italy	To develop new energy supply systems for military camps, and to ensure energy supplies factors into R&D to operational planning.		NOMAD	€19.6
				INDY	€14.2
Evidence					
Fourth-Round Addition	Slovenia	<ul style="list-style-type: none"> NOMAD “build[s] a collaborative framework among European industries, R&D organisations and relevant stakeholders" to develop energy storage solutions.¹³⁸ <ul style="list-style-type: none"> Expected to launch in 2024 and run four years.¹³⁹ INDY runs for 26 months beginning February 2023 to develop a roadmap for reducing fossil fuel emissions at military camps – overlaps with NOMAD’s firms.¹⁴⁰ 			
Result	Grew				
Timelines	IISS	Strategic Review (by 2025)		Operational or Closed	
	n.d.	Yes		-	
Categorization	EU-funded, pMS implemented, defined end-date and outputs, progressing (delayed to beyond the Strategic Review).				

¹³⁸ European Union, European Commission, European Defense Fund, *NOMAD*, July 20, 2022, https://defence-industry-space.ec.europa.eu/funding-and-grants/calls-proposals/european-defence-fund-2021-calls-proposals-results_en#summary-of-edf-2021-selected-projects---factsheet.

¹³⁹ Vincorion, “EU Supports Development of New Power Storage Systems by VINCORION Within the Scope of NOMAD Project,” September 23, 2022, <https://www.vincorion.com/en/eu-supports-development-of-new-power-storage-systems-by-vincorion-within-the-scope-of-nomad-project/>.

¹⁴⁰ European Union, European Commission, European Defense Fund, *INDY*, July 20, 2022, https://defence-industry-space.ec.europa.eu/funding-and-grants/calls-proposals/european-defence-fund-2021-calls-proposals-results_en#summary-of-edf-2021-selected-projects---factsheet.

INDY, Energy independent and efficient deployable military camps, “[The EDF-2021-INDY PROJECT KICK-OFF MEETING | 16-17 FEBRUARY 2023 | MARIBOR, SLOVENIA],” LinkedIn post, February 17, 2023, https://www.linkedin.com/posts/edf-2021-indy_kickoff-slovenia-collaboration-activity-7034805572642168832-Y38H?utm_source=share&utm_medium=member_desktop.

Table 15 – Deployable Military Disaster Relief Capability Package (DM-DRCP)			
Members			Purpose
Original	Italy Greece	Spain Croatia Austria	To establish a package of military assets rapidly deployable within and beyond EU-borders to respond to emergencies.
		Evidence	
Fifth-Round Addition		Ireland	<ul style="list-style-type: none"> • As of 2023, it entails a training center with courses on disaster response, and he expects it to complete by 2025.¹⁴¹ • In March 2020, the project was in the ‘ideation phase,’ foresaw a request for EU funds, and expected in-kind pMS contributions of staff and facilities.¹⁴²
Result	Grew		
Timelines	IISS	Strategic Review (by 2025)	
	n.r.	No	
Operational or Closed			Operational or Closed
			-
Categorization	Not EU-funded, pMS implemented, defined end-date and outputs, progressing.		

¹⁴¹ Republic of Ireland, Dáil Éireann, *Debate, Tuesday - 23 May 2023 Questions (186, 187) & Written Answer*, https://www.oireachtas.ie/en/debates/question/2023-05-23/187/#pq-answers-186_187.

¹⁴² Republic of Ireland, *IE PESCO Project Status - as per PESCO Secretariat Project Progress Report Of March 2020*, <https://assets.gov.ie/78992/9267015c-56b5-458d-9457-7f9723c4606c.pdf>.

Table 16 – MAS MCM				
Members			Purpose	EDIDP
Original	Belgium	Netherlands	To develop a “mix of (semi-) autonomous underwater, surface and aerial technologies and capabilities for maritime mine countermeasures.”	2020
	Greece	Portugal		MIRICLE
	Latvia	Romania		Worth
				€8.9
Second-Round Addition		Poland	Evidence	
2020 Addition		France	<ul style="list-style-type: none"> • As of 2023, expected to complete by 2030 and foresees the fitting out of capabilities developed under MAS MCM on current & future naval vessels.¹⁴³ • MIRICLE runs 24 months beginning December 2021. It aims at studies, design, prototyping, and testing.¹⁴⁴ <ul style="list-style-type: none"> ○ Concluded in September 2022 its ‘harmonization of requirements phase’ and team members participated in a multinational exercise in coordination with NATO and a related EDA project.¹⁴⁵ • The EDA consulted and provided its expertise.¹⁴⁶ 	
Fifth-Round Addition		Ireland		
Result	Grew			
Timelines	IISS		Strategic Review (by 2025)	Operational or Closed
	2025 for initial operational		No	-
Categorization	EU-funded, pMS implemented, defined end-date and outputs, on-time with the IISS-reported expectation of initial operational capability in 2025.			

¹⁴³ Republic of Ireland, Dáil Éireann, *Debate, Tuesday - 23 May 2023 Questions (186, 187) & Written Answer*.

¹⁴⁴ European Commission, European Defense Industrial Development Program, *MIRICLE*, June 30, 2021, https://defence-industry-space.ec.europa.eu/miricle_en.

Electronia Submarina, “MIRICLE: A Year On,” December 13, 2022, <https://electronica-submarina.com/2022/12/13/miricle-a-year-on/>.

¹⁴⁵ European Union, PESCO, “PESCO maritime mine counter measures project tested in multinational exercise,” November 28, 2022, <https://www.pesco.europa.eu/pressmedia/pesco-maritime-mine-counter-measures-project-tested-in-multinational-exercise/>.

“Unmanned Maritime Systems (UMS) research,” European Defense Agency, accessed May 23, 2023, [https://eda.europa.eu/what-we-do/all-activities/activities-search/unmanned-maritime-systems-\(ums\)-research](https://eda.europa.eu/what-we-do/all-activities/activities-search/unmanned-maritime-systems-(ums)-research).

¹⁴⁶ European Defense Agency, “Helping hands.”

Table 17 – HARMSPRO				
Members		Purpose		EDIDP 2020
Original	Italy Greece Spain Portugal	To deliver a new system of sensors, software, C2 systems to “conduct surveillance and protection of specified maritime areas.”		PADIC
				Worth
				€4.7
Evidence				
Second-Round Changes	Poland added, Spain removed	<ul style="list-style-type: none"> • PADIC runs 36-months long, concluding in 2024, to study, prototype, and test a new system.¹⁴⁷ <ul style="list-style-type: none"> ○ The nationalities of PADIC’s industrial consortium do not overlap with HARMSPRO’s pMS. 		
Result	Stable			
Timelines	IISS	Strategic Review (by 2025)	Operational or Closed	
	n.r.	Yes	-	
Categorization	EU-funded, pMS implemented, defined end-date and outputs, on-time.			

¹⁴⁷ European Commission, European Defense Industrial Development Program, *PADIC*, June 30, 2021, https://defence-industry-space.ec.europa.eu/padic_en.

PADIC, “The European Passive Radar Project PADIC has started,” December 2, 2021, <https://padic.eu/press-release/padic/>.

Table 18 – Upgrade of Maritime Surveillance (UMS)			
Members		Purpose	EDIDP 2019
Original	Greece Bulgaria Ireland Spain Croatia Italy Cyprus	It involves “using the existing infrastructure, deploying assets and possibly developing related capabilities in the future,” to do as its name says.	DECISMAR
			Worth €7.5
		Evidence	
2020 Addition	France	<ul style="list-style-type: none"> • As of 2023, UMS is expected to complete by 2025.¹⁴⁸ • DECISMAR is a 42-month project ranging from studies, to design, to prototyping and testing of a ‘decision support toolbox’ to conduct feasibility studies to meet the “High-Level Operational Requirements (HLORs) of the PESCO Project Upgrade of Maritime Surveillance.”¹⁴⁹ <ul style="list-style-type: none"> ○ Work began July 2021, presumably it concludes in 2024. ○ Latest in a longline of maritime surveillance projects, see PADR’s OCEAN2020 and the EDA’s UMS research program dating to 2009.¹⁵⁰ ○ Received administrative support from the EDA.¹⁵¹ 	
Result	Grew		
Timelines	IISS	Strategic Review (by 2025)	Operational or Closed
	n.d.	Yes	-
Categorization	EU-funded, pMS implemented, defined end-date and outputs, on-time.		

¹⁴⁸ Republic of Ireland, Dáil Éireann, *Debate, Tuesday - 23 May 2023 Questions (186, 187) & Written Answer*.

¹⁴⁹ European Commission, European Defense Industrial Development Program, *DECISMAR*, June 15, 2020, https://ec.europa.eu/commission/presscorner/detail/en/fs_20_1078.

¹⁵⁰ European Commission, Preparatory Action on Defense Research, *OCEAN2020*, June 29, 2021, https://defence-industry-space.ec.europa.eu/ocean2020_en.

“About Us,” *OCEAN2020*, accessed May 27, 2023, <https://ocean2020.eu/about-us/what-we-do/>.

“Unmanned Maritime Systems (UMS) research,” European Defense Agency, accessed May 23, 2023, [https://eda.europa.eu/what-we-do/all-activities/activities-search/unmanned-maritime-systems-\(ums\)-research](https://eda.europa.eu/what-we-do/all-activities/activities-search/unmanned-maritime-systems-(ums)-research).

¹⁵¹ European Defense Agency, *Annual Report 2022*, page 6.

Table 19 – CTIRISP						
Members			Purpose	EDIDP 2019	EDF 2022	
Original	Greece Hungary Portugal		Italy Spain Cyprus Austria	To share “cyber threat intelligence through a networked Member State platform.”	PANDORA	FACT
					Worth	
				€6.8	€26.9	
			Evidence			
Changes	2020 Removal		Austria	<ul style="list-style-type: none"> The Irish Defense Ministry notes it provides “additional analysis capabilities regarding Defence Forces adversaries Tactics, Techniques and Procedures and the Indicators of Compromise.” <ul style="list-style-type: none"> They foresee it ending by 2025.¹⁵² PANDORA ran for 24-months project with a concluding demonstration in 2022 that showed off a platform with full operational and technological capability.¹⁵³ FACT aims to cyber physical test range and federate existing national cyber ranges.¹⁵⁴ 		
	Fourth-Round Removal		Spain			
	Fifth-Round Addition		Ireland			
Current		Greece Hungary Portugal	Ireland Italy Cyprus			
Result		Shrank				
		IISS	Strategic Review (by 2025)		Operational or Closed	
Timelines		2020	Yes		-	
Categorization		EU-funded, pMS implemented, defined end-date and outputs, progressing (delayed from IISS to the Strategic Review).				

¹⁵² Republic of Ireland, Dáil Éireann, *Debate, Tuesday - 23 May 2023 Questions (186, 187) & Written Answer*.

¹⁵³ European Commission, European Defense Industrial Development Program, *PANDORA*, June 15, 2020, https://ec.europa.eu/commission/presscorner/detail/en/fs_20_1089.

European Commission, “EDIDP: EU-funded Cyber Defence Platform successfully demonstrated,” December 8, 2022, https://defence-industry-space.ec.europa.eu/edidp-eu-funded-cyber-defence-platform-successfully-demonstrated-2022-12-08_en.

¹⁵⁴ European Commission, European Defense Fund. *FACT*. June 26, 2022. https://defence-industry-space.ec.europa.eu/funding-and-grants/calls-proposals/result-edf-2022-calls-proposals_en.

Table 20 – CRRTs				
Members			Purpose	EDIDP 2020
Original	Lithuania Romania Spain Netherlands Finland France Croatia		To “collectively respond to cyber incidents” and to carry out “proactive measures, such as vulnerability assessments.”	CYBER4DE
				Worth
				€9.3
Evidence				
Changes	Second-Round Additions	Estonia Poland		<ul style="list-style-type: none"> Launched in February 2018 – before the formal approval of PESCO projects.¹⁵⁵ CYBER4DE is a 30-month project running through every development stage concluding with testing and qualification of an “easily deployable, modular and scalable” toolbox for CRRTs.¹⁵⁶ <ul style="list-style-type: none"> Aims for completion in 2024.¹⁵⁷ Separate from the CRRTs themselves. The EDA consulted and provided its expertise.¹⁵⁸ Operational as of February 2022 and activated to assist Ukrainian institutions.¹⁵⁹ <ul style="list-style-type: none"> CRRTs also tested in Moldova and in the EUTM Mozambique.¹⁶⁰
	Third-Round	Italy added; Spain, France removed		
	2020 Removals	Italy, Finland		
	Fifth-Round Additions	Belgium Slovenia		
Current	Lithuania Netherlands Romania	Belgium Slovenia	Estonia Croatia Poland	
Result	Grew			
Timelines		IISS	Strategic Review (by 2025)	Operational or Closed
		2022-2024	Yes	Yes, operational
Categorization		Not EU-funded, pMS implemented, operational.		

¹⁵⁵ “Project Management team,” CRRT, accessed May 27, 2023, <https://crrts.eu/management.html>.

¹⁵⁶ European Commission, European Defense Industrial Development Program, *CYBER4DE*, June 30, 2021, https://defence-industry-space.ec.europa.eu/cyber4de_en.

¹⁵⁷ CYBER4DE, “Europe to have a toolbox for tackling cyber security challenges next year,” April 14, 2023, <https://www.cyber4de.eu/post/europe-to-have-a-toolbox-for-tackling-cyber-security-challenges-next-year>.

¹⁵⁸ European Defense Agency, “Helping hands.”

¹⁵⁹ European Defense Agency, “Activation of first capability developed under PESCO points to strength of cooperation in cyber defence,” February 24, 2022, <https://eda.europa.eu/news-and-events/news/2022/02/24/-of-first-capability-developed-under-pesco-points-to-strength-of-cooperation-in-cyber-defence>.

¹⁶⁰ European Union, *PESCO, Permanent Structured Cooperation (PESCO)'s projects – Overview* [As of the Fifth Round].

Table 21 – EUMILCOM					
Members		Purpose		EDIDP 2019	Worth
Original	Spain	Germany	To develop an ops HQ for the EU by integrating “Communication and Information Systems (CIS), Intelligence Surveillance and Reconnaissance (ISR),” & logistics for interoperability among pMS, EU forces, NATO, & civil agencies.	ESC2	€20
	Italy	Portugal		ECYSAP	€10.9
Second-Round Addition	France			EDF 2021	Worth
	Luxembourg			EU-Guardian	€13.4
Third-Round Addition				EDF 2022	Worth
Result	Grew			EC2	€30
Evidence					
<ul style="list-style-type: none"> • German Defense Ministry says initial operational capability began in 2020.¹⁶¹ • ESC2 covers a feasibility study and system design, concluding in December 2023.¹⁶² • ECYSAP goes beyond ESC2’s activities, up to testing and qualification of a capability enabling real-time cyber situational awareness, presumably ending in 2025.¹⁶³ <ul style="list-style-type: none"> ○ EDA manages both and Indra coordinates the two, plus EU-Guardian.¹⁶⁴ • EU-Guardian runs 34 months, and launched in January 2023, to study and design an AI-solution automating parts of cyber defense and incident management.¹⁶⁵ <ul style="list-style-type: none"> ○ At least one instance of cooperation between the three Indra-projects and two other EU-funded cyber projects, PANDORA and CYBER4DE.¹⁶⁶ 					

¹⁶¹ “Strategic C2 System for CSDP,” Bundesministerium der Verteidigung, Federal Republic of Germany, accessed June 11, 2023, <https://www.bmvg.de/de/themen/sicherheitspolitik/gsvp-sicherheits-verteidigungspolitik-eu/strategic-c2-system-for-csdp-pesco-projekt-264022>.

¹⁶² European Commission, European Defense Industrial Development Program, *ESC2*, June 15, 2020, https://ec.europa.eu/commission/presscorner/detail/en/fs_20_1081.

“ESC2: European Strategic Command and Control (ESC2) System,” Indra, accessed June 11, 2023, <https://www.indracompany.com/en/indra/esc2-european-strategic-command-control-esc2-system>.

¹⁶³ “Concept and approach,” ECYSAP, accessed June 11, 2023, <https://www.ecysap.eu/concept.html>.

¹⁶⁴ European Defense Agency, *Annual Report 2021*, March 25, 2022, <https://eda.europa.eu/publications-and-data/all-publications/annual-report-2021>, 13.

European Commission, European Defense Industrial Development Program, *ECYSAP*, June 15, 2020, https://ec.europa.eu/commission/presscorner/detail/en/fs_20_1080.

European Defense Agency, “Ambitious cyberspace situational awareness project enters next phase,” December 20, 2022, <https://eda.europa.eu/news-and-events/news/2022/12/20/ambitious-cyberspace-situational-awareness-project-enters-next-phase>.

¹⁶⁵ European Commission, European Defense Fund, *EU-GUARDIAN*, July 22, 2022, https://defence-industry-space.ec.europa.eu/funding-and-grants/calls-proposals/european-defence-fund-2021-calls-proposals-results_en#summary-of-edf-2021-selected-projects---factsheet.

“Events,” EU-GUARDIAN, accessed June 11, 2023, <https://www.eu-guardian.eu/events.html>.

¹⁶⁶ Indra, “Indra displays the progress made by Europe’s largest defence-related cyber situational awareness project,” May 22, 2023, <https://www.indracompany.com/en/noticia/indra-displays-progress-made-europes-largest-defence-related-cyber-situational-awareness>.

Table 21 – EUMILCOM			
<ul style="list-style-type: none"> • EC2, follows on ESC2, up to prototyping and testing of a command-and-control system.¹⁶⁷ 			
Timelines	IISS	Strategic Review (by 2025)	Operational or Closed
	2022	Yes	-
Categorization	EU-funded, EDA implemented, defined end-date and outputs, progressing (delayed from IISS to the Strategic Review).		

Table 22 – AIFV/AAV/LAV			
Members		Purpose	
Original	Italy Greece Slovakia	To “develop and build a prototype European Armoured Infantry Fighting Vehicle / Amphibious Assault Vehicle / Light Armoured Vehicle.”	
Result	Stable	Evidence	
		<ul style="list-style-type: none"> • No connection to the EU-funded FAMOUS and FAMOUS2 armored vehicle projects, and no Italian participation in project. • As of 2021, Italian Defense Ministry expected deliveries by 2030.¹⁶⁸ 	
Timelines	IISS	Strategic Review (by 2025)	Operational or Closed
	n.r.	No	-
Categorization	Not EU-funded, pMS implemented, stagnant.		

¹⁶⁷ European Commission, European Defense Fund, *EC2*, June 26, 2023, https://defence-industry-space.ec.europa.eu/funding-and-grants/calls-proposals/result-edf-2022-calls-proposals_en.

¹⁶⁸ Tom Kington, “Italy nurses EU plans for a common armored fighting vehicle,” *Defense News*, June 7, 2020, <https://www.defensenews.com/global/europe/2022/06/07/italy-nurses-eu-plans-for-a-common-armored-fighting-vehicle/>.

Table 23 – Indirect Fire Support (EuroArtillery)					
Members			Purpose	EDIDP 2020	Worth
Original	Slovakia	Hungary Italy	“Develop a mobile precision artillery platform.” ¹⁶⁹	e-COLORSS	€3.5
Result	N/A			FIRES	€3.5
Evidence					
<ul style="list-style-type: none"> • e-COLORSS aims to study and design a truck-mounted 155-mm cannon and rocket launcher over 24 months. <ul style="list-style-type: none"> ○ The coordinating firm, Everis Aeroespacial Y Defensa collapsed in 2022.¹⁷⁰ • FIRES aims to prepare “the future generation of artillery 155 mm projectiles [the NATO standard for artillery munition] and rockets” over 24 months. <ul style="list-style-type: none"> ○ Unlike most other EU-funded projects e-COLORSS & FIRES lacks a webpage. ○ The database of projects and results lists neither project.¹⁷¹ • Slovak Defense Ministry notes that by beginning 2019 pMS had defined the project’s goals and were discussing a framework for project management.¹⁷² 					
Timelines	IISS		Strategic Review (by 2025)	Operational or Closed	
	2030		No	Yes, closed	
Categorization	EU-funded, pMS implemented, closed.				

¹⁶⁹ European Union, *PESCO, Permanent Structured Cooperation (PESCO)'s projects – Overview* [As of the Fourth Round], November 16, 2021, https://www.consilium.europa.eu/en/press/press-releases/2021/11/16/eu-defence-cooperation-council-launches-the-4th-wave-of-new-pesco-projects/#new_tab.

¹⁷⁰ Bécares, Gallardo, Flórez, “La guerra interna.”

¹⁷¹ Funding and tender opportunities database (programming period 2014-2020; European Defence Industrial Development Program), European Commission.

¹⁷² “Euroartillery,” translated by Google Translate, Slovakian Ministry of Defense, Slovak Republic, accessed May 27, 2023, <https://www.mosr.sk/euroartillery/>.

Table 24 – EUFOR CROC			
Members		Purpose	
Original	Germany France Cyprus	Italy Spain	It allows pMS to plan strategically based on a variety of scenarios for EU-crisis response missions and to preemptively assign force packages to these plans, thus accelerating force generation. ¹⁷³
Fourth-Round Additions	Greece Austria	Evidence	
Fifth-Round Addition	Netherlands	<ul style="list-style-type: none"> • All EU member states participate in the identification of military forces.¹⁷⁴ • Unlike other German Defense Ministry factsheets to PESCO projects that it participates in, EUFOR CROC’s page includes no date for expected or initial operating capability.¹⁷⁵ • Reporting on a leaked PESCO Secretariat progress report in 2021, noted that the report warned EUFOR CROC’s completion date was “not identified.”¹⁷⁶ 	
Result	Grew		
Timelines	IISS	Strategic Review (by 2025)	Operational or Closed
	n.d.	Yes	-
Categorization	Not EU-funded, pMS implemented, unclear [because membership grew].		

¹⁷³ “EUFOR CROC,” Bundesministerium der Verteidigung, Federal Republic of Germany, accessed June 11, 2023,

<https://www.bmvg.de/de/themen/sicherheitspolitik/gsvp-sicherheits-verteidigungspolitik-eu/eufor-croc-pesco-projekt-264008>.

¹⁷⁴ Bundesministerium der Verteidigung (@BMVg_Bundeswehr), “#EUFOR CROC: Zur Verbesserung der Krisenreaktionsfähigkeit,” Tweet, August 20, 2020, https://twitter.com/BMVg_Bundeswehr/status/1296401844185505799?s=20.

¹⁷⁵ “PESCO,” Bundesministerium der Verteidigung, Federal Republic of Germany.

¹⁷⁶ Barigazzi, “EU military projects face delays.”

APPENDIX 5: SECOND ROUND PESCO PROJECTS' PROGRESS

Each table lists: projects' purpose per, either their description as of the fifth round or, for closed projects, their original description; their original members and, when applicable membership changes by round; whether the project grew, shrank, or remained stable; evidence for their progress or lack thereof; their appearance, when available, their response to the IISS survey (either, a date, no date [n.d. in the table], or no response [n.r. in the table]) and appearance in the 2020 Strategic Review; and my categorization of the project according to my typology – see Figure 1. When applicable, the table also lists associated EU-funded projects and their worth in millions.

Table 25 – Helicopter Hot and High Training (H3 Training)			
Members		Purpose	
Original	Greece Italy Romania	To “train helicopter aircrews – military and civilian – in specialized flights skills and tactics unique to ‘Hot and High’ environments through a specialized course.	
Result	Stable	Evidence	
		<ul style="list-style-type: none"> • One week course, expected to begin being offered in 2020, by Greek Army Aviation.¹⁷⁷ <ul style="list-style-type: none"> ○ No more recent sources for courses’ status. • In the Council’s table of PESCO projects – updated with each new round – the description for H3 Training was updated with the fourth (2021) and fifth (2023) rounds. <ul style="list-style-type: none"> ○ Originally, the project mentioned training in a variety of skills.¹⁷⁸ The first update adds ‘course,’ providing a more specific deliverable.¹⁷⁹ The second update adds that the course takes advantage of ‘Hellenic Army Aviation IOT’s’ experience – increasing the specificity by naming an implementing body.¹⁸⁰ 	
Timelines	IISS	Strategic Review (by 2025)	Operational or Closed
	September 2019	Yes	-
Categorization	Not EU-funded, pMS implemented, stagnant.		

¹⁷⁷ Savvas Vlassis, “PESCO: Army Air Force ready to provide “Hot and High” training,” translated by Google Translate, *Doureios*, July 31, 2019, <https://doureios.com/pesco-etoimi-i-aeroporia-stratoy-gia-parohi-ekpaidefseos-hot-and-high/>.

¹⁷⁸ European Union, *PESCO, Permanent Structured Cooperation (PESCO)'s projects – Overview* [As of the Second Round], November 19, 2018, https://www.consilium.europa.eu/en/press/press-releases/2018/11/19/defence-cooperation-council-launches-17-new-pesco-projects/#new_tab.

¹⁷⁹ European Union, *PESCO, Permanent Structured Cooperation (PESCO)'s projects – Overview* [As of the Fourth Round].

¹⁸⁰ European Union, *PESCO, Permanent Structured Cooperation (PESCO)'s projects – Overview* [As of the Fifth Round].

Table 26 – Joint EU Intelligence School (JEIS)			
Members		Purpose	
Original	Greece Cyprus	Train EU member states intelligence & non-military personnel.	
Result	Stable		
Evidence			
<ul style="list-style-type: none"> February 2021 meeting of the pMS, five observer states, and several EU bodies to update the roadmap for the project.¹⁸¹ <ul style="list-style-type: none"> No more recent press releases on Cypriot or Greek Ministry of Defense websites. The Intelligence College of Europe was founded in 2019 as an intergovernmental organization with 23 partners, which overlaps with the aims of the JEIS. <ul style="list-style-type: none"> Its responsibilities are academic programs and networking amongst European intelligence executives "to compare their experiences at a non-operational level."¹⁸² 			
Timelines	IISS	Strategic Review (by 2025)	Operational or Closed
	March 2021	Yes	-
Categorization	Not EU-funded, pMS implemented, stagnant.		

Table 27 – EU Test and Evaluation Centres (EUTEC)			
Members		Purpose	
Original	France Sweden Slovakia	To create a network of EU test and evaluation centers that prioritize working with EU-supported projects and develop a specific center. ¹⁸³	
Result	N/A	Evidence	
		<ul style="list-style-type: none"> The project closed in May 2023, when the fifth round launched.¹⁸⁴ The EDA oversees a longstanding database of European test and evaluation centers.¹⁸⁵ 	
Timelines	IISS	Strategic Review (by 2025)	Operational or Closed
	n.d.	No	Yes, closed
Categorization	Not EU-funded, pMS implemented, closed.		

¹⁸¹ Hellenic Republic, Hellenic National Defense General Staff, "Conducting a Meeting on the Implementation Progress of the Establishment of the Interdisciplinary School of Information of the E.U.," translated by Google Translate, February 8, 2021, <https://geetha.mil.gr/diexagogi-syskepsis-gia-tin-proodo-ylopoiisis-tis-idrysis-tis-diakladikis-scholis-pliroforion-tis-e-e/>.

¹⁸² "The College," The Intelligence College in Europe, accessed May 27, 2023, <https://www.intelligence-college-europe.org/presentation/>.

¹⁸³ European Union, *PESCO, Permanent Structured Cooperation (PESCO)'s projects – Overview* [As of the Fourth Round].

¹⁸⁴ COUNCIL DECISION (CFSP) no. 2023/995 (amending and updating Decision (CFSP) 2018/340 establishing the list of projects to be developed under PESCO), May 22, 2023, OJ L 135/123, Preamble, Section 12, <http://data.europa.eu/eli/dec/2023/995/oj>.

¹⁸⁵ European Defense Agency, *Defence Test and Evaluation*, January 26, 2021, [https://eda.europa.eu/what-we-do/all-activities/activities-search/defence-test-and-evaluation-base-\(dteb\)](https://eda.europa.eu/what-we-do/all-activities/activities-search/defence-test-and-evaluation-base-(dteb)).

Table 28 – Integrated Unmanned Ground System (iUGS)						
Original Members			Third-Round Addition	Fifth-Round Removal	EDIDP 2019	EDF 2021
Belgium	Czechia	France	Germany	Hungary	iMUGS	COMMANDS
Hungary	<i>Estonia</i>	Spain			Worth	Worth
Netherlands	Finland	Latvia			€30.6	€24.8
	Poland					
Purpose		Result			Stable	
To develop an unmanned ground vehicle (UGV) with payloads for different missions.						
Evidence						
<ul style="list-style-type: none"> • iMUGS ran 30 months covering studies to prototyping to testing, ending in May 2023.¹⁸⁶ <ul style="list-style-type: none"> ○ Industry hopes for a successor project developing a bigger, faster, armed UGV and projects a rough budget of €100 to €150 million with a start date in 2025.¹⁸⁷ • PESCO’s fifth round successor project, iUGS2, echoes the comments of industry; it aims to develop a UGV capable of teaming with “manned infantry fighting vehicles/Main Battle Tanks,” read heavier, and providing “direct support by fire,” i.e., armed.¹⁸⁸ • Neither the 2022 nor the 2023 EDF Work Programs include a call for UGS, despite a “jointly developed and ready to procure” UGS being a main expected outcome.¹⁸⁹ • COMMANDS aims for completion by 2025 and covers studies to prototyping to testing of a solution to “improve the robustness of the last-kilometre supply convoy operations.”¹⁹⁰ 						
Timelines		IISS	Strategic Review (by 2025)		Operational or Closed	
		n.r.	Yes		-	
Categorization		EU-funded, pMS implemented, defined end-date and outputs, on-time.				

¹⁸⁶ European Commission, European Defense Industrial Development Program, *iMUGS*, June 15, 2020, https://ec.europa.eu/commission/presscorner/detail/en/fs_20_1085.

Europäische Sicherheit & Technik, „Completion of the PESCO project iMUGS in Spain,” May 2023, <https://esut.de/en/2023/05/meldungen/41777/abschluss-des-pesco-projekts-imugs-in-spanien/>.

¹⁸⁷ Paolo Valpolini, “Towards iMUGS II,” *European Defense Review*, December 20, 2022, <https://www.edrmagazine.eu/towards-imugs-ii>.

¹⁸⁸ European Union, *PESCO, Permanent Structured Cooperation (PESCO)'s projects – Overview* [As of the Fifth Round].

¹⁸⁹ European Commission, *the adoption of the work programme for 2023 - Part II*, 1;

European Commission, *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 2022 - Part II*, C(2022) 3403, https://defence-industry-space.ec.europa.eu/eu-defence-industry/european-defence-fund-edf_en, pages 1-2;

European Commission, *European Defence Fund Indicative multiannual perspective 2021-2027* [2023 version], March 29, 2023, https://defence-industry-space.ec.europa.eu/document/download/e7488e8f-584a-45ef-be74-d86b5d187054_en?filename=EDF%20Indicative%20multiannual%20perspective.pdf, 31.

¹⁹⁰ European Commission, European Defense Fund, *COMMANDS*, January 25, 2023, https://defence-industry-space.ec.europa.eu/funding-and-grants/calls-proposals/european-defence-fund-2021-calls-proposals-results_en#summary-of-edf-2021-selected-projects---factsheet.

COMMANDS, “The EU defence project COMMANDS is well on track,” June 14, 2023, <https://edfcommands.eu/the-eu-defence-project-commands-is-well-on-track>.

Table 29 – EU Beyond Line Of Sight (BLOS) Land Battlefield Missile Systems				
Members		Purpose	EDIDP 2019	Worth
Original	France Belgium Cyprus	To develop a next generation BLOS missile system integrated into a variety of platforms, as well as joint training and developing a common doctrine.	LynkEUs	€6.4
			EDF 2021	Worth
			MARSEUS	€25.0
		Evidence		
Fifth-Round Addition	Sweden	<ul style="list-style-type: none"> • LynkEUs ran 24 months to define a concept of operations and test it with a demonstration.¹⁹¹ <ul style="list-style-type: none"> ○ Project concluded in November 2022 with a test. • MARSEUS runs 36 months to continue to integrate BLOS capabilities into an existing missile system, as well as integrate the system on a wider array of platforms.¹⁹² 		
Result	Grew			
Timelines	IISS	Strategic Review (by 2025)	Operational or Closed	
	n.d.	Yes	-	
Categorization	EU-funded, pMS implemented, defined end-date and outputs, on-time.			

¹⁹¹ European Commission, European Defense Industrial Development Program, *LynkEUs*, June 15, 2020, https://ec.europa.eu/commission/presscorner/detail/en/fs_20_1087.

MBDA, “EDIDP LynkEUs project – success of European BLOS firings with AKERON MP Missiles system in Cyprus,” October 7, 2022, <https://www.mbda-systems.com/press-releases/edidp-lynkeus-project-success-of-european-blos-firings-with-akeron-mp-missiles-system-in-cyprus/>.

¹⁹² European Commission, European Defense Fund, *MARSEUS*, January 25, 2023, https://defence-industry-space.ec.europa.eu/funding-and-grants/calls-proposals/european-defence-fund-2021-calls-proposals-results_en#summary-of-edf-2021-selected-projects---factsheet.

Christina Mackenzie, “EU investing millions in new missile range extension program MARSEUS,” *Breaking Defense*, July 26, 2022, <https://breakingdefense.com/2022/07/eu-investing-millions-in-new-missile-range-extension-program-marseus/>.

Table 30 – DIVEPACK					
Members		Purpose		EDIDP 2020	Worth
Original	Bulgaria Greece France	To develop “an interoperable specialized modular asset for full spectrum defensive underwater intervention operations.”		CUIIS	€5.5
		Evidence			
2020 Addition	Romania	<ul style="list-style-type: none"> • The pMS asked and the EDA’s Steering Board approved the agency’s role in harmonizing the projects’ requirements and elaborating its business case.¹⁹³ The agency expects to hand those documents over to the pMS at the beginning of 2022, so the pMS can contract with industry to develop the system.¹⁹⁴ • CUIIS aims to build a “command, control, communications and information (C4I) mission system” for divers.¹⁹⁵ <ul style="list-style-type: none"> ○ A Bulgarian firm coordinates CUIIS, and other consortium members overlap with DIVEPACK’s pMS. ○ Began in January 2022 and runs 36 months, presumably it concludes in early 2025.¹⁹⁶ • The European Union Network of Diving Centres (EUNDC), a related third-round PESCO project, also includes Romania, Bulgaria, and France. 			
Fifth-Round Addition	Italy				
Result	Grew				
Timelines	IISS	Strategic Review (by 2025)		Operational or Closed	
	2024	Yes		-	
Categorization	EU-funded, EDA implemented, defined end-date and outputs, progressing (delayed from IISS to the Strategic Review).				

¹⁹³ European Defense Agency, “EDA to support DIVEPACK PESCO project,” April 16, 2020, <https://eda.europa.eu/news-and-events/news/2020/04/16/eda-to-support-divepack-pesco-project>.

¹⁹⁴ European Defense Agency, “Helping hands.”

¹⁹⁵ European Commission, European Defense Industrial Development Program, *CUIIS*, June 30, 2021, https://defence-industry-space.ec.europa.eu/cuiis_en.

¹⁹⁶ CUISS, “Comprehensive Underwater Intervention Information System (CUIIS) Project Kick-off meeting,” January 11, 2022, <https://cuiis.eu/news-and-events/comprehensive-underwater-intervention-information-system-cuiis-project-kick-meeting>.

Table 31 – Eurodrone					
Members		Purpose		EDIDP	Worth
Original	Germany Czechia Spain France Italy	To develop the Eurodrone, a preexisting OCCAR project launched in 2016 and later integrated into PESCO. ¹⁹⁷		Direct award ¹⁹⁸	€98.0
		Evidence			
		<ul style="list-style-type: none"> In February 2022, OCCAR signed a contract for 20 aircraft and 60 ground stations on behalf of the pMS – deliveries are expected in 2029.¹⁹⁹ <ul style="list-style-type: none"> OCCAR expects the first prototype to begin construction in 2024. 			
Result	Stable				
Timelines		IISS	Strategic Review (by 2025)	Operational or Closed	
		2025	No	-	
Categorization		EU-funded, OCCAR implemented, defined end-date and outputs, progressing (delayed from IISS to beyond the Strategic Review).			

Table 32 – TIGER Mark III					
Members		Purpose			
Original	France Germany Spain	To upgrade the existing Tiger attack helicopters’ “detection, aggression and communication capabilities.”			
Result		Evidence			
	Stable	<ul style="list-style-type: none"> Tiger, like ESSOR and Eurodrone, is a preexisting OCCAR project, and launched in 2001 and is in service with Germany, France, Spain, and Australia. Its midlife upgrade is ongoing.²⁰⁰ Germany is ending its participation in the Mark III midlife upgrade.²⁰¹ 			
Timelines		IISS	Strategic Review (by 2025)	Operational or Closed	
		n.d.	No	-	
Categorization		Not EU-funded, OCCAR implemented, defined end-date and outputs, progressing.			

¹⁹⁷ “MALE RPAS - Medium Altitude Long Endurance Remotely Piloted Aircraft System,” OCCAR, accessed June 10, 2023, <https://www.occar.int/programmes/male-rpas>.

¹⁹⁸ European Defense Industrial Development Program, *MALE RPAS*.

¹⁹⁹ Lorenzo Buzzoni, Laure Brillaud and Nico Schmidt, “The Eurodrone: An industrial project fuelled by politics,” *Investigate Europe*, March 31, 2022, <https://www.investigate-europe.eu/en/2022/eurodrone/>.

²⁰⁰ “TIGER – A New Generation of Helicopters,” OCCAR, accessed June 10, 2023, <https://www.occar.int/programmes/tiger>.

²⁰¹ Thomas Wiegold, „Jetzt offiziell: (Langes) Ende für den Kampfhubschrauber Tiger, Nachfolgeentscheidung dieses Jahr,” *Augen geradeaus!*, May 13, 2023, <https://augengeradeaus.net/2023/05/jetzt-offiziell-langes-ende-fuer-den-kampfhubschrauber-tiger-nachfolgeentscheidung-dieses-jahr/>.

Table 33 – Counter Unmanned Aerial System (C-UAS)				
To develop a “system of systems with C2 dedicated architecture, modular, integrated [...] to counter the threat posed by mini and micro Unmanned Aerial Systems.”				
EDIDP 2020	JEY-CUAS	Evidence	Purpose	
Worth	€13.5	<ul style="list-style-type: none"> •JEY-CUAS covers studies and design work over 24 months, with kick-off in July 2022.²⁰² With a July 2022 launch, it should conclude in summer 2024. •The 2023 EDF Work Program foresees allocating up to €43 million for a follow-on C-UAS project.²⁰³ <ul style="list-style-type: none"> ○ If the original project delivers positive results, the 2023 Multiannual Indicative Perspective expects the follow-on “to develop a prototype [...] leading to possible future joint procurement.”²⁰⁴ 		
Members				
Original	Italy Czechia			
Fifth-Round Addition	Sweden			
Result	Grew			
		IISS	Strategic Review (by 2025)	Operational or Closed
Timelines		n.r.	No	-
Categorization		EU-funded, pMS implemented, defined end-date and outputs, progressing.		

²⁰² European Defense Fund, *JEY-CUAS*;

Numalis, “Numalis went to Italy for EDIDP JEY-CUAS project,” July 15, 2022, <https://numalis.com/news-82.php>;

Arnout de Jong, “Last week Delft Dynamics B.V. hosted [...],” LinkedIn post, March 2023, https://www.linkedin.com/posts/arnout-de-jong-42b4a89_edidp-dronecatcher-drones-activity-7043677761550376960-LNb6?utm_source=share&utm_medium=member_desktop.

²⁰³ European Commission, *the adoption of the work programme for 2023 - Part II*, page 20.

²⁰⁴ European Commission, *European Defence Fund Indicative multiannual perspective 2021-2027* [2023 version], 29.

Table 34 – EHAAP				
Members		Purpose	EDF 2021	Worth
Original	Italy France	To develop an ISR (intelligence, surveillance, and reconnaissance) balloon.	EuroHAPS	€43
		Evidence		
Result	Stable	<ul style="list-style-type: none"> Over a 38-month period EuroHAPS aims to develop three demonstrators, a “Strategic Airship, Hybrid Airship and Autonomous Stratospheric balloon system [...] that address 4 ISR missions.”²⁰⁵ The project launched in March 2023 and test flights are expected in 2024. A wider array of defense ministries participates in the EuroHAPS project than PESCO’s EHAAP.²⁰⁶ 		
		IISS		Strategic Review (by 2025)
Timelines		n.r.	No	-
Categorization		EU-funded, pMS implemented, defined end-date and outputs, progressing.		

Table 35 – SOC2 for SJO				
Members		Purpose	EDF 2022	Worth
Original	Greece Cyprus	To develop a command-and-control post for special operations forces.	PROTEAS	€19.9
		Evidence		
Result	Stable	<ul style="list-style-type: none"> PROTEAS, with a Greek coordinating firm, aims to prototype a deployable special operations force command post.²⁰⁷ No recent press releases found in Greek military or Ministry of Defense websites, besides those announcing the project’s inclusion in PESCO. 		
		IISS		Strategic Review (by 2025)
Timelines		2024	Yes	-
Categorization		EU-funded, pMS implemented, defined end-date and outputs, progressing.		

²⁰⁵ European Commission, European Defense Fund, *EuroHAPS*, July 22, 2022, https://defence-industry-space.ec.europa.eu/funding-and-grants/calls-proposals/european-defence-fund-2021-calls-proposals-results_en#summary-of-edf-2021-selected-projects---factsheet.

²⁰⁶ Peter Felstead, “Thales Alenia Space initiates EuroHAPS project,” *European Security & Defense*, March 9, 2023, <https://euro-sd.com/2023/03/news/30164/thales-alenia-space-initiates-eurohaps-project/>.

²⁰⁷ European Commission, European Defense Fund, *PROTEAS*, June 26, 2023, https://defence-industry-space.ec.europa.eu/funding-and-grants/calls-proposals/result-edf-2022-calls-proposals_en.

Table 36 – JISR			
Members			Purpose
Original	Fifth-Round	Result	To study existing European electronic warfare (EW) capabilities, identify gaps in their capabilities, and produce a joint EW concept of operations. This may include joint training of EW experts.
<i>Czechia</i>	Addition	Grew	
Germany	Lithuania		
Evidence			
<ul style="list-style-type: none"> • As of May 2019, two meetings held by the pMS to agree on an implementation process that included the harmonization of requirements and a concept of operations.²⁰⁸ <ul style="list-style-type: none"> ○ Neither of these tasks require industry involvement, which limits sources. • No mentions on either the Czech or German Defense Ministry’s websites. <ul style="list-style-type: none"> ○ A German Defense Ministry overview of PESCO projects in which Germany participates – last updated in 2020 – contains no mention of JISR despite the project launching in November 2018.²⁰⁹ • However, the project’s description in the table of PESCO projects changed between the fourth and fifth rounds. <ul style="list-style-type: none"> ○ As of the fifth round, JISR may lead to “the establishment of a joint combined EU EW Task Force,” replacing the original language: “establishment of a joint EW unit.” 			
	IISS	Strategic Review (by 2025)	Operational or Closed
Timelines	n.d.	Yes	-
Categorization	Not EU-funded, pMS implemented, unclear.		

²⁰⁸ CZ Defence, “The Czech Republic Has Become the Guarantor of the Electronic Warfare Project Within the PESCO,” May 20, 2019, <https://www.czdefence.com/article/the-czech-republic-has-become-the-guarantor-of-the-electronic-warfare-project-within-the-pesco>.

²⁰⁹ “PESCO,” Bundesministerium der Verteidigung, Federal Republic of Germany, accessed June 11, 2023, <https://www.bmvg.de/de/themen/sicherheitspolitik/gsvp-sicherheits-verteidigungspolitik-eu/pesco>.

Table 37 – (CBRN SaaS)				
Members		Purpose	EDIDP	Worth
Original	Austria France Croatia Hungary Slovenia	To build a sensor network of unmanned aerial and ground vehicles interoperable with legacy systems to provide an understanding of CBRN threats during CSDP missions.	2019 CBRN- RSS	€6.7
		Evidence		
Result	Stable	<ul style="list-style-type: none"> In November 2019, the EDA assumed responsibility of the PESCO project, with a run-time until 2022. It aims at delivering a demonstrator and a roadmap of future systems to develop.²¹⁰ CBRN-RSS overlaps: only one demonstrator to be produced by mid-2024 and the EDA coordinates between the member states, the Commission, and the industry consortium developing the projects.²¹¹ The project entered prototyping in 2022.²¹² 		
Timelines	IISS	Strategic Review (by 2025)	Operational or Closed	
	n.r.	Yes	-	
Categorization	EU-funded, EDA implemented, defined end-date and outputs, on-time.			

Table 38 – Co-basing				
Members			Purpose	
Original	Germany Netherlands	Czechia Belgium	France Spain	To improve “the sharing of [pMS’] bases and support points.” ²¹³
Result	N/A	Evidence		
		<ul style="list-style-type: none"> In 2021, a leaked PESCO Secretariat report warned that the project had no allocated resources and no timeline.²¹⁴ Closed in May 2023, when the fifth round launched. 		
Timelines	IISS	Strategic Review (by 2025)	Operational or Closed	
	2021	No	Yes, closed	
Categorization	Not EU-funded, pMS implemented, closed.			

²¹⁰ European Defense Agency, “EDA to take forward PESCO project on CBRN surveillance,” November 12, 2019, <https://eda.europa.eu/news-and-events/news/2019/11/12/eda-to-take-forward-pesco-project-on-cbrn-surveillance>.

²¹¹ European Commission, European Defense Industrial Development Program, *CBRN-RSS*, June 30, 2021, https://defence-industry-space.ec.europa.eu/cbrn-rss_en.

European Defense Agency, “EDA, project manager of CBRN RSS,” January 10, 2022, <https://eda.europa.eu/news-and-events/news/2022/01/10/eda-project-manager-of-cbrn-rss>.

²¹² European Defense Agency, *Annual Report 2022*, 11.

²¹³ European Union, *PESCO, Permanent Structured Cooperation (PESCO)'s projects – Overview* [As of the Fourth Round].

²¹⁴ Barigazzi, “EU military projects face delays.”

Table 39 – GMSCE				
Members			Purpose	
Original	Romania <i>Germany</i> Greece	France	To support CSDP missions and operations with a unified source of geo-meteorological and oceanographic data by building a data system.	
Additions	Third-Round	Austria Portugal	Evidence • Initial operational capability at the end of 2020 & full operational capability by the end of 2022. ²¹⁵ • In 2022, project members held their eight meeting in Portugal, and it received EDA support. ²¹⁶	
	Fourth-Round	Belgium Luxembourg		
Result		Grew		
Timelines	IISS		Strategic Review (by 2025)	Operational or Closed
	n.d.		Yes	-
Categorization	Not EU-funded, pMS implemented, defined end-date and outputs, on-time.			

²¹⁵ “GeoMETOC Geo-Meteorological and Oceanographic Support Coordination Element (GMSCE),” Bundesministerium der Verteidigung, Federal Republic of Germany, accessed June 11, 2023, <https://www.bmvg.de/de/themen/sicherheitspolitik/gsvp-sicherheits-verteidigungspolitik-eu/geometoc-support-coordination-element-gmsce-pesco-projekt-264018>.

²¹⁶ Instituto Hidrográfico, “PESCO visita o Instituto Hidrográfico,” December 5, 2022, <https://www.hidrografico.pt/noticia/965>.

Table 40 – EU Radio Navigation Solution (EURAS)					
Members		Purpose		EDIDP 2019	Worth
Original	France Belgium Germany Spain Italy	To expand European militaries’ access to Galileo, an EU satellite constellation comparable to the U.S.’ GPS system.		GEODE	€43.7
				EDF 2021	Worth
				NAVIGUARD	€24.3
		Evidence			
Third-Round Addition	Poland	<ul style="list-style-type: none"> • GEODE runs 72 months until 2026.²¹⁷ • NAVIGUARD runs 48 months and began in February 2023, presumably it ends in early 2027.²¹⁸ <ul style="list-style-type: none"> ○ The two share a coordinator, indicative of the coordinative benefits of supranational staff awarding projects.²¹⁹ 			
Result	Grew				
		IISS	Strategic Review (by 2025)	Operational or Closed	
Timelines		2020 for initial operational capability		Yes	-
Categorization		EU-funded, pMS implemented, defined end-date and outputs, progressing (delayed from IISS to beyond the Strategic Review).			

²¹⁷ FDC, “GEODE: establishing the framework for developing the Galileo PRS military user segment,” February 8, 2021, <https://www.fdc.fr/geode-project-dev-galileo-prs-military-user-segment/>.

European Commission, European Defense Industrial Development Program, *GEODE*, June 15, 2020, https://ec.europa.eu/commission/presscorner/detail/en/fs_20_1084.

²¹⁸ European Commission, European Defense Fund, *NAVIGUARD*, January 25, 2023, https://defence-industry-space.ec.europa.eu/funding-and-grants/calls-proposals/european-defence-fund-2021-calls-proposals-results_en#summary-of-edf-2021-selected-projects---factsheet.

²¹⁹ Peter Gutierrez, “NAVIGUARD for Ground – A Space-Based PRS Integrity,” *Inside GNSS*, April 19, 2023, <https://insidegnss.com/navguard-for-ground-a-space-based-prs-integrity/>.

Table 41 – EU-SSA-N					
Members		Purpose	EU-Funds		Worth
Original	France <i>Italy</i>	To develop an autonomous EU space situational awareness capability to protect its space assets.	EDIDP 2020	SAURON	€7.5
			EDF 2021	INTEGRAL	€7.5
				Naucrates	€4.0
Evidence					
2020 Additions	Germany Netherlands	<ul style="list-style-type: none"> • SAURON plans to develop sensors to identify satellites in orbit, with tests of the sensors scheduled for late 2023.²²⁰ • INTEGRAL linked to SAURON via Ariane Group, aims to develop software to link national space surveillance centers.²²¹ • Naucrates aims to build a satellite capable of imaging other satellites, with an expected end in 2025.²²² • The 2023 EDF Work Program contains two calls addressing SSA with an indicative combined budget of €125 million.²²³ <ul style="list-style-type: none"> ○ The 2023 EDF Indicative Multiannual Perspective states these projects “should lead by 2030 to the joint procurement of SSA capabilities.”²²⁴ ○ This is one of five main expected outcomes in the space category of actions. 			
Result	Grew				
Timelines	IISS	Strategic Review (by 2025)		Operational or Closed	
	n.r.	No		-	
Categorization	EU-funded, pMS implemented, defined end-date and outputs, progressing.				

²²⁰ European Commission, European Defense Industrial Development Program, *SAURON*, June 30, 2020, https://defence-industry-space.ec.europa.eu/sauron_en.

²²¹ Ariane Group, “ArianeGroup to participate in space surveillance for Europe,” January 7, 2021, <https://www.ariane.group/en/news/arianegroup-to-participate-in-space-surveillance-for-europe/>.

²²² European Commission, European Defense Fund, *NAUCRATES*, July 22, 2022, https://defence-industry-space.ec.europa.eu/funding-and-grants/calls-proposals/european-defence-fund-2021-calls-proposals-results_en#summary-of-edf-2021-selected-projects---factsheet.

INTEGRASYS, “INTEGRASYS Solutions for Government Applications in 2021 EDF Proposals: NAUCRATES and RFSHIELD,” July 27, 2022, <https://www.integrasys-space.com/post/integrasys-solutions-for-government-applications-in-2021-edf-proposals-naucrates-and-rfshield>.

²²³ European Commission, *the adoption of the work programme for 2023 - Part II*, 14-15.

²²⁴ European Commission, *European Defence Fund Indicative multiannual perspective 2021-2027* [2023 version], page 14.

APPENDIX 6: THIRD ROUND PESCO PROJECTS' PROGRESS

Each table lists: projects' purpose per their description as of the fifth round, their original description; their original members and, when applicable membership changes by round; whether the project grew, shrank, or remained stable; evidence for their progress or lack thereof; their appearance, when available, their appearance in the 2020 Strategic Review; and my categorization of the project according to my typology – see Figure 1. When applicable, the table also lists associated EU-funded projects and their worth in millions. No projects from the third round have closed or are operational – I exclude that category from these tables.

Table 42 – EUROSIM					
Members		Purpose	EDF 2022	Worth	
Original	Hungary Germany France Poland Slovenia	To integrate existing simulation centers by building a cloud-based network.	FEDERATES	€29.5	
	Evidence				
Result	Stable	<ul style="list-style-type: none"> • No mentions on the Hungarian defense ministry's website besides the press release announcing the project's inclusion in PESCO. <ul style="list-style-type: none"> ◦ EDA provided administrative & consultative support in 2021.²²⁵ • FEDERATES covers studies to testing, and it is also associated with MBT-SIMTEC.²²⁶ <ul style="list-style-type: none"> ◦ Its consortium overlaps with EUROSIM's pMS. 			
Strategic Review (by 2025)					
Yes					
Categorization	EU-funded, pMS implemented, defined end-date and outputs, progressing.				

²²⁵ European Defense Agency, *Annual Report 2021*, page 7.

²²⁶ European Commission, European Defense Fund, *FEDERATES*, June 26, 2023, https://defence-industry-space.ec.europa.eu/funding-and-grants/calls-proposals/result-edf-2022-calls-proposals_en.

Table 43 – EU CAIH				
Members		Purpose	EDF 2021	Worth
Original	Portugal Spain	It is “a coordination point for future cyber education, training and exercises, [to] explore synergies with industry and academia,” as well as NATO and the EU.	ACTING	€16.2
		Evidence		
Fifth-Round Addition	Romania	<ul style="list-style-type: none"> • A working group to design it started in 2021 and the Portuguese government established the hub as a non-profit in 2023.²²⁷ • ACTING networks together ‘cyber ranges’ for training and exercises through, for example, simulations.²²⁸ <ul style="list-style-type: none"> ◦ Consortium’s nationalities differ, mostly, from EU CAIH’s pMS, nor do ACTING’s supporting member states overlap with the fourth-round Cyber Ranges project or the EDA’s cyber ranges federation project launched in 2017.²²⁹ 		
Result	Grew			
Strategic Review (by 2025)				
Yes				
Categorization	Not EU-funded, pMS implemented, defined end-date and outputs, progressing (ACTING does not fund the establishment of the CAIH itself).			

²²⁷ “Implementation,” translated by Google Translate, Cyber Academy and Innovation Hub, Portuguese Defense Ministry, Portuguese Republic accessed May 27, 2023, <https://www.defesa.gov.pt/pt/pdefesa/CAIH/pt/caih/implementacao/Paginas/default.aspx>.

“Cyber Academia and Innovation Hub,” idD Portugal Defence, accessed May 27, 2023, <https://www.iddportugal.pt/en/activities/caih/>.

²²⁸ European Commission, European Defense Fund, *ACTING*, January 25, 2023, https://defence-industry-space.ec.europa.eu/funding-and-grants/calls-proposals/european-defence-fund-2021-calls-proposals-results_en#summary-of-edf-2021-selected-projects---factsheet.

“Use Cases,” ACTING, accessed May 27, 2023, <https://acting-project.eu/use-cases/>.

²²⁹ European Defense Agency, *Cyber Ranges Federation Project*, July 5, 2021, <https://eda.europa.eu/publications-and-data/factsheets/factsheet-cyber-ranges-federation-project>.

Table 44 – Special Operations Forces Medical Training Centre (SMTC)		
Members		Purpose
Original	<i>Poland</i> <i>Hungary</i>	To expand the Polish Military Medical Training Centre in Łódź into a center for training for special forces.
Result	Stable	Evidence
		<ul style="list-style-type: none"> • Launched in November 2019, and in December 2019 the existing center in Łódź held a meeting of stakeholders.²³⁰ No subsequent press releases from the center though. • In March 2020, the project was in the ideation phase and Poland planned to spend €5.75 between 2020 and 2022 to modernize it.²³¹ • Though the evidence is older than January 2022, which ought to deem the project stagnant, the combination of a specific Euro-amount and a press release from the center which plans to host the SMTC is a greater amount of evidence than other stagnant projects.
Strategic Review (by 2025)		
No		
Categorization	Not EU-funded, pMS implemented, unclear.	

²³⁰ Republic of Poland, Polish Ministry of Defense, The Military Medical Training Center, “Meeting of Representatives of the Ministry of National Defence to Discuss Implementation of the Polish Project of the SOF Medical Training Centre under PESCO Programme,” December 5, 2019, https://archiwum-wckmed.wp.mil.pl/en/61_701.html.

²³¹ Republic of Ireland, *IE PESCO Project Status - as per PESCO Secretariat Project Progress Report Of March 2020*.

Table 45 – CBRNDTR		
Purpose		
To train in live and simulated conditions at the EU-level personnel for EU CSDP missions and operations, and to serve as a test center for the CBRN industry.		
Members		Evidence
Original	Romania France Italy	<ul style="list-style-type: none"> • VERTIgO aims over 24 months to study, design and prototype a simulation platform for CBRN training, including hardware for realism like a CBRN VR-mask.²³² • The project began in December 2021, presumably it finishes by the end of 2023, and the EDA provided administrative support.²³³ <ul style="list-style-type: none"> ◦ Consortium’s nationalities differ, mostly, from EU CAIH’s pMS, nor do ACTING’s supporting member states overlap with the fourth-round Cyber Ranges project or the EDA’s cyber ranges federation project launched in 2017.
Result	Stable	
EDIDP 2020	VERTIgO	
Worth	€2.5	
Strategic Review (by 2025)		
Yes		
Categorization	EU-funded, pMS implemented, defined end-date and outputs, on-time.	

Table 46 – European Union Network of Diving Centers (EUNDC)				
Members			Purpose	
Original	Romania	France	Bulgaria	Harmonize divers’ education, training, certification.
Result	Stable	Evidence		
Strategic Review (by 2025)		<ul style="list-style-type: none"> • Received administrative support from the EDA in 2022, but no evidence on the Romanian Ministry of Defense webpage.²³⁴ 		
Yes				
Categorization	Not EU-funded, pMS implemented, unclear.			

²³² European Commission, European Defense Industrial Development Program, *VERTIgO*, June 30, 2021, https://defence-industry-space.ec.europa.eu/vertigo_en.

²³³ VERTIgO, “The project VERTIgO officially launched with a 2-days kick-off meeting in SAFE HQ,” December 14, 2021, <https://cbrn-vertigo.eu/the-project-vertigo-officially-launched-with-a-2-days-kick-off-meeting-in-safe-hq/>.

²³⁴ European Defense Agency, *Annual Report 2022*, page 27.

Table 47 – Maritime Unmanned Anti-Submarine System (MUSAS)				
Members		Purpose	EDIDP	Worth
Original	Portugal Spain France Sweden	To develop a “command, control and communications (C3) service architecture, for anti-submarine warfare.”	2020 SEANICE	€9.0
		Evidence		
Result	Stable	<ul style="list-style-type: none"> • SEANICE covers all tasks, from studies to prototyping, and it kicked off in mid-2022, presumably it ends by 2024.²³⁵ • Its tasks and consortium align with MUSAS’ goals and pMS. • The 2023 EDF Work Program includes a call worth up to €45 million for design and system prototyping for unmanned anti-submarine and seabed warfare – this could also fall under the fifth-round project Critical Seabed Infrastructure Protection.²³⁶ 		
Strategic Review (by 2025)				
No				
Categorization	EU-funded, pMS implemented, defined end-date and outputs, progressing.			

²³⁵ David ChereL, “European Defense is on the rocket launching pad!,” LinkedIn post, June 2022, https://www.linkedin.com/posts/david-cherel-6487b521_edidp-thalesdms-comp4drone-activity-6879096208262995969-k5lZ/?utm_source=share&utm_medium=member_desktop.

²³⁶ European Commission, *the adoption of the work programme for 2023 - Part II*, page 22.

Table 48 – European Patrol Corvette (EPC)				
Members		Purpose	EDF	Worth
Original	Italy France	To design and prototype a European Patrol Corvette capable of a variety of missions.	2021 EPC ²³⁷	€60
2020 Addition	Greece Spain	<p style="text-align: center;">Evidence</p> <ul style="list-style-type: none"> • Handed to the EDA to implement in 2021, with its role to oversee but not write the requirements for the corvette over a period of 30 months, and by 2026 to 2027 the pMS expect a sailing prototype of the EPC.²³⁸ • The EDF’s award in mid-2022 covered study and design work, and in December 2022, the EPC was handed off to OCCAR to implement – suggesting that the EDF project’s 24-month clock had started.²³⁹ • 2023 EDF Work Program contains a call, worth €156.5 million, following on the 2021 project to “complete the Critical Design Review and launch prototyping and testing activities.”²⁴⁰ 		
Fifth- Round Addition	Roma nia			
Result	Grew			
Strategic Review (by 2025)	No			
Categorization	EU-funded, OCCAR & EDA implemented, defined end-date and outputs, progressing.			

²³⁷ European Defense Fund, *EPC*.

²³⁸ European Defense Agency, “EDA to support ‘European Patrol Corvette’
European Defense Agency, “Helping hands.”

²³⁹ European Commission, “European Commission, EDA and OCCAR sign.”

²⁴⁰ European Commission, *the adoption of the work programme for 2023 - Part II*, page 27.

Table 49 – Airborne Electronic Attack (AEA)				
Members		Purpose	EDIDP 2019	Worth
Original	Spain France Sweden	To “design, develop and test a multi-jamming capability” capable of integration into a variety of platforms.	REACT	€11.5
			EDF 2022	Worth
			REACTII	€40.0
		Evidence		
Result	Stable	<ul style="list-style-type: none"> • REACT ran a feasibility study and design of such a capability, with work expected to end in 2023.²⁴¹ • REACTII directly follows REACT and shares a coordinating firm, Indra, with the aim to produce a tested and qualified electronic warfare system able to be integrated into existing aircraft.²⁴² • In 2023, OCCAR created a small program division and integrated REACT into it.²⁴³ 		
Strategic Review (by 2025)	No			
Categorization	EU-funded, OCCAR implemented, defined end-date and outputs, progressing.			

²⁴¹ European Commission, European Defense Industrial Development Program, *REACT*, June 15, 2021, https://ec.europa.eu/commission/presscorner/detail/en/fs_20_1091.

“REACT: Responsive Electronic Attack for Cooperative Tasks,” Indra, accessed June 11, 2023, <https://www.indracompany.com/en/indra/react-responsive-electronic-attack-cooperative-tasks>.

²⁴² European Commission, European Defense Fund, *REACTII*, June 26, 2022, https://defence-industry-space.ec.europa.eu/funding-and-grants/calls-proposals/result-edf-2022-calls-proposals_en.

²⁴³ OCCAR, *OCCAR Business Plan 2023*, page 41.

Table 50 – Cyber and Information Domain Coordination Centre (CIDCC)				
Members			Purpose	EDF 2022
Original	Czechia Spain	Hungary Netherlands <i>Germany</i>	To create a standing multinational cyber coordination center, where member states “decide sovereignly on case-by-case basis for which threat, incident and operation they contribute with means or information.”	EUCINF
		Worth		
2020 Removal		Czechia		€32.9
Fourth-Round Changes		Spain removed; France added	Evidence	
Current	France Germany	Hungary Netherlands	<ul style="list-style-type: none"> • Initial operational capability in 2023, with full operational capability in 2026, at which point it will be permanently integrated into EU structures.²⁴⁴ • EDA supported it in 2022.²⁴⁵ • EUCINF builds a toolbox for the CIDCC.²⁴⁶ 	
Result	Shrank			
Strategic Review (by 2025)			No	
Categorization	EU-funded, EDA implemented, defined end-date and outputs, progressing.			

²⁴⁴ “Cyber and Information Domain Coordination Centre (CIDCC),” Bundesministerium der Verteidigung, Federal Republic of Germany, accessed June 11, 2023, <https://www.bmvg.de/de/themen/sicherheitspolitik/gsvp-sicherheitsverteidigungspolitik-eu/cyber-and-information-domain-coordination-center-pesco-projekt-264020>.

²⁴⁵ European Defense Agency, *Annual Report 2022*, page 6.

²⁴⁶ European Commission, European Defense Fund, *FACT*, June 26, 2022, https://defence-industry-space.ec.europa.eu/funding-and-grants/calls-proposals/result-edf-2022-calls-proposals_en.

Table 51 – TWISTER				
Members		Purpose	EDF 2020	Worth
Original	France Spain Italy Netherlands Finland	To develop a ballistic missile defense system composed of an endo-atmospheric interceptor and a space-based early warning system.	EUHYDEF	€100.0
			EDF 2022	Worth
			ODIN's EYE II	€90.0
		Evidence		
2020 Addition	Germany	<ul style="list-style-type: none"> • EUHYDEF began in May 2023, runs 36 months, and aims to study and design an interceptor.²⁴⁷ • The Commission delegated EU HYDEF to OCCAR.²⁴⁸ • MBDA led a competing consortium to win the EDF's bid and when the fund rejected its proposal, MBDA developed a competing hypersonic missile defense project (HYDIS) with the support of Germany, France, Italy. and the Netherlands.²⁴⁹ • The 2023 EDF Work Program foresees directly awarding HYDIS €81.5 million too because it more closely links to PESCO's TWISTER, and it provides the EU two options for ballistic missile defense to choose from. • Notably, the work program says the management mode for HYDIS is OCCAR, despite the organization also signing an agreement to implement EU HYDEF too.²⁵⁰ • ODIN's EYE II focuses on the early warning aspect of TWISTER, 90 million for study and design work.²⁵¹ 		
Result	Stable			
Strategic Review (by 2025)				
No				
Categorization				
EU-funded, OCCAR implemented, defined end-date and outputs, progressing.				

²⁴⁷ Andrew White, “Details of EU HYDEF programme emerge as concept study phase begins,” *Janes Defense*, May 19, 2023, <https://www.janes.com/defence-news/news-detail/details-of-eu-hydef-programme-emerge-as-concept-study-phase-begins>.

European Defense Fund, *EU HYDEF*.

²⁴⁸ European Commission, “European Commission, EDA and OCCAR sign.”

²⁴⁹ Vivienne Machi, “MBDA renews case for building Europe’s first hypersonic interceptor,” *Defense News*, June 20, 2023, https://www.defensenews.com/global/europe/2023/06/20/mbda-renews-case-for-building-europes-first-hypersonic-interceptor/?utm_source=sailthru&utm_medium=email&utm_campaign=dfn-dnr.

²⁵⁰ European Commission, *the adoption of the work programme for 2023 - Part II*, page 29.

²⁵¹ European Defense Fund, *ODIN's EYEII*.

Table 52 – Materials and components for technological EU competitiveness (MAC-EU)			
Members			Purpose
Original	<i>France</i> Spain	Portugal Romania	To develop the EDTIB for materials and components where security of supply is threatened.
Fourth-Round Addition	Germany	Evidence <ul style="list-style-type: none"> • EDA provided expertise and administrative support to the project, but no mentions on the French defense ministry website.²⁵² • The 2022 and 2023 EDF Indicative Multiannual Perspectives dedicate each an entire section to materials and components.²⁵³ • The lack of specifics and clear connections to existing EDA and EDF supply chain work ought to deem MAC-EU stagnant, but its importance in EDF planning counteracts that, hence it is unclear. 	
Result	Grew		
Strategic Review (by 2025)			
Yes			
Categorization	Not EU-funded, pMS implemented, unclear.		

²⁵² European Defense Agency, *Annual Report 2020*, March 30, 2021, <https://eda.europa.eu/publications-and-data/all-publications/annual-report-2020>, 7.

²⁵³ European Commission, *European Defence Fund Indicative multiannual perspective 2021-2027* [2022 version], May 25, 2022, https://defence-industry-space.ec.europa.eu/document/download/d7242b04-13bf-442e-b6a4-67eb8b2c2cc0_en?filename=EDF%20Indicative%20multiannual%20perspective.pdf, page 8.

European Commission, *European Defence Fund Indicative multiannual perspective 2021-2027* [2023 version], page 23.

Table 53 – EU Collaborative Warfare Capabilities (ECoWAR)						
Members		Purpose	EDIDP	EDF		Worth
Original	France Belgium Spain Hungary Romania Sweden	To improve the interoperability of European militaries from “sensors to effectors.”	2020	2021	EDOCC	€40.0
			MUSHER		ACHILE	€39.9
			Worth	2022	E-NACSOS	€64.9
			€9.9		LATACC	€48.7
Evidence						
2020 Addition	Poland	<ul style="list-style-type: none"> •MUSHER plans to study, prototype, and test a system “allowing manned rotorcraft platforms and unmanned platforms [...] to interoperate,” but has no project webpage or corporate press release besides those issued when the project received EU-funding. •EDOCC will study and design over 36 months a cloud platform for military operations.²⁵⁴ <ul style="list-style-type: none"> ○ It began January 2023, presumably it concludes in 2026.²⁵⁵ •ACHILE aims to design, prototype, and demonstrate a soldier system based on earlier EU-funded research (PADR’s GOSSRA).²⁵⁶ <ul style="list-style-type: none"> ○ That project too began in early 2023 and runs for 48 months, presumably ending in early 2025.²⁵⁷ •E-NACSOS plans to study, design, prototype, and test new protocols and systems to “improve the ability to identify, classify and track” aerial threats at sea.²⁵⁸ •LATACC will study, design, and prototype a framework that integrates legacy and new technologies at all levels of ground forces, from individual soldier to command post.²⁵⁹ 				
Fifth-Round Removal	Hungary					
Result	Stable					
Strategic Review (by 2025)						
No						
Categorization	EU-funded, pMS implemented, defined end-date and outputs, progressing.					

²⁵⁴ European Commission, European Defense Fund, *EDOCC*, January 25, 2022, https://defence-industry-space.ec.europa.eu/funding-and-grants/calls-proposals/european-defence-fund-2021-calls-proposals-results_en#summary-of-edf-2021-selected-projects---factsheet.

²⁵⁵ Airbus, “Airbus launches European Defence Fund R&D projects,” January 31, 2023, <https://www.airbus.com/en/newsroom/press-releases/2023-01-airbus-launches-european-defence-fund-rd-projects>.

²⁵⁶ European Commission, European Defense Fund, *ACHILE*, July 22, 2022, https://defence-industry-space.ec.europa.eu/funding-and-grants/calls-proposals/european-defence-fund-2021-calls-proposals-results_en#summary-of-edf-2021-selected-projects---factsheet.

²⁵⁷ Bionic System Solutions, “About The European Defence Fund ACHILE and BSS,” July 27, 2022, <https://www.bionicsystemsolutions.com/achile/>.

²⁵⁸ European Commission, European Defense Fund, *E-NACSOS*, July 20, 2022, https://defence-industry-space.ec.europa.eu/funding-and-grants/calls-proposals/result-edf-2022-calls-proposals_en.

²⁵⁹ European Commission, European Defense Fund, *LATACC*, July 20, 2022, https://defence-industry-space.ec.europa.eu/funding-and-grants/calls-proposals/result-edf-2022-calls-proposals_en.

Table 54 – GLORIA		
Members		Purpose
Original	Italy France Romania	To develop a modeling and simulation architecture, as well as a multinational competence center, to enable the integration of unmanned aircraft into civilian airspace.
Result	Stable	Evidence
		<ul style="list-style-type: none"> • No mentions on the Italian defense ministry or EDA website.
Strategic Review (by 2025)		No
Categorization	Not EU-funded, pMS implemented, stagnant.	

APPENDIX 7: FOURTH ROUND PESCO PROJECTS' PROGRESS

Each table lists: projects' purpose per their description as of the fifth round; their original members and, when applicable membership changes by round, whether the project grew, shrank, or remained stable; evidence for their progress or lack thereof; and my categorization of the project according to my typology – see Figure 1. When applicable, the table also lists associated EU-funded projects and their worth. No projects from the fourth round have closed or are operational – I exclude that category from these tables.

Table 55 –MBT-SIMTEC				
Members		Purpose	EDF 2022	Worth
Original	<i>Greece</i>	To establish a main battle tank simulation center and network existing national centers.	FEDERATES	€29.5
	France Cyprus			
		Evidence		
		<ul style="list-style-type: none"> Relies on existing national infrastructure.²⁶⁰ FEDERATES also associates with the third round's EUROSIM, and FEDERATES consortium aligns with EUROSIM, not MBT-SIMTEC. 		
Result	Stable			
Categorization		EU-funded, pMS implemented, defined end-date and outputs, progressing.		

Table 56 – EU Military Partnership (EU MilPart)				
Members		Purpose		
Original	<i>France</i>	A platform for pMS and other actors to exchange best practices on training other state's militaries.		
	Estonia Italy Austria			
		Evidence		
		<ul style="list-style-type: none"> Not reliant on industry support and likely utilizes existing infrastructure, therefore sources for the project are likely to be few. 		
Result	Stable			
Categorization		Not EU-funded, pMS implemented, unclear.		

²⁶⁰ Flavia Camargos Pereira, "EDA launches new land collaborative projects," *Shephard*, November 25, 2021, <https://www.shephardmedia.com/news/landwarfareintl/pesco-launches-new-land-collaborative-projects/>.

Table 57 – Essential Elements of European Escort (4E)		
Members		Purpose
Original	Spain Italy Portugal	To develop five systems for a future European escort ship launched between 2035 and 2040.
		Evidence
Result	Stable	<ul style="list-style-type: none"> •The project launched a website before its inclusion in PESCO and it focuses on soliciting industry input about each of those systems.²⁶¹
Categorization		Not EU-funded, pMS implemented, defined end-date and outputs, progressing.

Table 58 – M-SASV			
Members		Purpose	EDF 2022
Original	Estonia France Latvia Romania	To develop a semi-autonomous ship capable of a variety of missions, including anti-submarine warfare, anti-surface warfare, and ISR – intelligence, surveillance, and reconnaissance.	EUROGUARD
			Worth
			€65.0
		Evidence	
Result	Stable	<ul style="list-style-type: none"> • EUROGUARD plans to study, prototype, and test such a vessel.²⁶² • pMS harmonized their requirements prior to the launch of the PESCO project.²⁶³ 	
Categorization		EU-funded, pMS implemented, defined end-date and outputs, progressing.	

²⁶¹ “Proyecto 4E "Essential Elements of European Escorts",” translated by Google Translate, Navantia, accessed June 10, 2023, <https://www.navantia.es/es/lineas-de-negocio/fragatas/proyecto4e/>.

“Lanzamiento Proyecto 4E,” translated by Google Translate, Proyecto 4E, accessed June 10, 2023, <https://www.proyecto4e.com/evento-lanzamiento>.

²⁶² European Defense Fund, *EUROGUARD*.

²⁶³ Xavier Vavasseur, “European Defence Agency Launches New MUSV Project,” *Naval News*, November 17, 2021, <https://www.navalnews.com/naval-news/2021/11/european-defence-agency-launches-new-musv-project/>.

Table 59 – Strategic Air Transport for Outsized Cargo (SATOC)		
Members		Purpose
Original	<i>Germany</i> Czechia France Netherlands Slovenia	To harmonize requirements and identify a common solution for the currently unmet European demand for strategic air transport.
	Evidence	
Fifth-Round Removal	Slovenia	<ul style="list-style-type: none"> •Received EDA consultative support in 2022 to develop common requirements.²⁶⁴ •EDA foresees that processing running until 2023, followed by a project launching in 2026 if the pMS identify a common European solution.²⁶⁵
Result	Shrank	
Categorization	Not EU-funded, pMS implemented, defined end-date and outputs, progressing.	

Table 60 – Next Generation Small RPAS (NGSR)		
Members		Purpose
Original	<i>Spain</i> Portugal	Romania Slovenia Germany
	To develop a light unmanned aerial vehicle capable of taking off without a runway and utilizable by ground and naval forces, as well as law enforcement.	
Fifth-Round Addition	Hungary	Evidence
Result	Grew	<ul style="list-style-type: none"> •The EDA hosted the kick-off meeting in summer 2022.²⁶⁶ •NGSR has three stages: studies running until 2023, systems integrating in 2024 and 2025, and prototyping in 2026.²⁶⁷
Categorization	Not EU-funded, pMS implemented, defined end-date and outputs, progressing.	

²⁶⁴ European Union, PESCO, “EDA supporting two PESCO projects on future European airlift capabilities,” January 31, 2023, <https://www.pesco.europa.eu/pressmedia/eda-supporting-two-pesco-projects-on-future-european-airlift-capabilities/>.

²⁶⁵ European Defense Agency, “14 New PESCO Projects Launched in Boost for European Defence Cooperation,” November 16, 2021, <https://eda.europa.eu/news-and-events/news/2021/11/16/14-new-pesco-projects-launched-in-boost-for-european-defence-cooperation>.

²⁶⁶ European Defense Agency, “#PESCO project | Next Generation Small #RPAS (NGSR) [...],” LinkedIn post, June 2022, https://www.linkedin.com/posts/european-defence-agency_pesco-rpas-uas-activity-6917504231788670976-iscB?utm_source=share&utm_medium=member_desktop.

²⁶⁷ European Defense Agency, “14 New PESCO Projects Launched.”

Table 61 – Rotorcraft Docking Station for Drones (RDSD)		
Members		Purpose
Original	Italy	To launch and recover small drones from helicopters.
	France	
		Evidence
Result	Stable	•No mention on the Italian defense ministry website.
Categorization		Not EU-funded, pMS implemented, stagnant.

Table 62 – Small Scalable Weapons (SSW)		
Members		Purpose
Original	<i>Italy</i>	To develop a loitering weapon capable of targeting soft or lightly armored vehicles.
	France	
		Evidence
Result	Stable	<ul style="list-style-type: none"> •Allegedly, MBDA is involved in the project as of 2022.²⁶⁸ •French defense ministry awarded a consortium to develop a loitering munition in June 2023, but no mention of SSW or Italy joining.²⁶⁹ •Given that the capability is being developed by a pMS, I classify it as progressing despite the discrepancies.
Categorization		Not EU-funded, pMS implemented, defined end-date and outputs, progressing.

²⁶⁸ Paolo Valpolini, “MBDA moves into the Loitering Munitions domain,” *European Defense Review*, April 22, 2022, <https://www.edrmagazine.eu/mbda-moves-into-the-loitering-munitions-domain>.

²⁶⁹ Paolo Valpolini, “PAS 2023 – The French Defence Innovation Agency assigns to Nexter Arrowtech, EOS Technologie and Traak a development contract for the Larinae remotely operated munition project,” *European Defense Review*, June 22, 2023, <https://www.edrmagazine.eu/the-french-defence-innovation-agency-assigns-to-nexter-arrowtech-eos-technologie-and-traak-a-development-contract-for-the-larinae-remotely-operated-munition-project>.

Table 63 – Air Power			
Members		Purpose	EDF 2022
Original	France Greece Cyprus	To improve European air forces’ air superiority capabilities by identifying the technologies needed for future aircraft.	EPIIC
			Worth €74.9
		Evidence	
		<ul style="list-style-type: none"> • EPIIC studies new technologies for future fighter cockpits.²⁷⁰ • Thales, the coordinating firm, plans to focus on helmet mounted sights and systems to monitor crew health.²⁷¹ 	
Result	Stable	<ul style="list-style-type: none"> • Given that EPIIC runs 37 months and Thales released its press release in June 2023, the project presumably ends in 2026.²⁷² • pMS harmonized their requirements prior to the launch of the PESCO project.²⁷³ 	
Categorization		EU-funded, pMS implemented, defined end-date and outputs, progressing.	

Table 64 – Future Medium-size Tactical Cargo (FMTC)		
Members		Purpose
Original	France Germany Sweden	To increase air mobility by complementing the missions of the A400M, the primary European tactical airlifter.
		Evidence
Fifth-Round Addition	Spain	<ul style="list-style-type: none"> • No associated EDF-funded projects, though EDF 2022 provided €30 to FASETT to conduct a feasibility study into the transport aircraft needs of member states around 2030 to 2040.
Result	Grew	<ul style="list-style-type: none"> • The consortium for the study is coordinated by Airbus’ French, German, and Spanish components – overlapping with FMTC’s pMS, therefore I categorize it as progressing. • EDA consulted FMTC in 2022 to develop common requirements.²⁷⁴
Categorization		Not EU-funded, pMS implemented, defined end-date and outputs, progressing.

²⁷⁰ European Commission, European Defense Fund, *EPIIC*, January 25, 2023, https://defence-industry-space.ec.europa.eu/funding-and-grants/calls-proposals/european-defence-fund-2021-calls-proposals-results_en#summary-of-edf-2021-selected-projects---factsheet.

²⁷¹ Thales, “Thales takes the lead in the European EPIIC research project to design the technologies for the future military cockpit,” June 22, 2023, https://www.thalesgroup.com/en/worldwide/defence/press_release/thales-takes-lead-european-epiic-research-project-design.

²⁷² “EPIIC,” EPIIC, accessed June 20, 2023, <https://edf-epiic-project.eu/>.

²⁷³ Xavier Vavasseur, “European Defence Agency Launches New MUSV Project,” *Naval News*, November 17, 2021, <https://www.navalnews.com/naval-news/2021/11/european-defence-agency-launches-new-musv-project/>.

²⁷⁴ PESCO, “EDA supporting two PESCO projects on future European airlift.”

Table 65 – Cyber Ranges Federations (CRF)				
Members		Purpose	EDF 2021	Worth
Original	<i>Estonia</i> <i>Bulgaria</i> <i>France</i> <i>Italy</i> <i>Latvia</i> <i>Luxembourg</i> <i>Finland</i>	By federating existing national cyber ranges, CRF aims to improve the quality of training and use the federation for research.	ACTING	€16.2
		Evidence		
Result	Stable	<ul style="list-style-type: none"> • CRF launched after the bidding process for ACTING closed, thus, ACTING is unassociated with CRF and is solely associated with the third round’s EU CAIH. • However, ACTING aims to network together ‘cyber ranges’ for training and exercises through, for example, simulations.²⁷⁵ <ul style="list-style-type: none"> ◦ ACTING’s consortium’s nationalities differ, mostly, from EU CAIH’s pMS, nor do ACTING’s supporting member states overlap with CRF or the EDA’s cyber ranges federation project launched in 2017.²⁷⁶ • However, the pMS in the EDA’s cyber ranges federation project, launched in 2017, do overlap with CRF.²⁷⁷ <ul style="list-style-type: none"> ◦ Estonia, Latvia, Finland, & Italy participate in both, therefore, I categorize it as EDA-implemented, funded, and progressing. 		
Categorization	EU-funded, EDA implemented, defined end-date and outputs, progressing.			

²⁷⁵ European Commission, European Defense Fund, *ACTING*, January 25, 2023, https://defence-industry-space.ec.europa.eu/funding-and-grants/calls-proposals/european-defence-fund-2021-calls-proposals-results_en#summary-of-edf-2021-selected-projects---factsheet.

“Use Cases,” ACTING, accessed May 27, 2023, <https://acting-project.eu/use-cases/>.

²⁷⁶ European Defense Agency, *Cyber Ranges Federation Project*, July 5, 2021, <https://eda.europa.eu/publications-and-data/factsheets/factsheet-cyber-ranges-federation-project>.

²⁷⁷ European Defense Agency, *Cyber Ranges Federation Project*.

Table 66 – AMIDA-UT			
Members		Purpose	
Original	Spain France	<i>Portugal</i>	To create a tool to identify and map target structures more quickly using automation.
Fifth-Round Addition	Austria	Evidence	
Result	Grew	<ul style="list-style-type: none"> • In 2023, the pMS met in April with industry representatives and plan to hold another meeting in November.²⁷⁸ 	
Categorization	Not EU-funded, pMS implemented, defined end-date and outputs, progressing.		

Table 67 – Common Hub for Governmental Imagery (CoHGI)			
Members		Purpose	EDF 2022
Original	Spain France Austria	To improve the exchange of classified images at the EU-level between member states and EU institutions by enhancing the existing EU Satellite Center.	SPIDER
	Germany Lithuania Romania		Worth
	Luxembourg Netherlands	Evidence	€39.4
Result	Stable	<ul style="list-style-type: none"> • SPIDER conducts a feasibility study, and other tasks up to prototyping, of a space based ISR constellation.²⁷⁹ 	
Categorization	EU-funded, EDA implemented, defined end-date and outputs, progressing.		

Table 68 – Defence of Space Assets (DoSA)			
Members		Purpose	
Original	<i>France</i> Germany Italy Austria	Poland Portugal Romania	To improve the EU’s ability to operate militarily in space.
	Evidence		<ul style="list-style-type: none"> • DoSA plans to identify future technology needs and operational requirements, as well as have the pMS conduct exercises. • This definition phase began in 2022 and aims to finish by 2026 with a proposal for new systems.²⁸⁰
Fifth-Round Addition	Spain		
Result	Grew		
Categorization	Not EU-funded, pMS implemented, defined end-date and outputs, progressing.		

²⁷⁸ Portuguese Republic, Portuguese Army, “Army organizes the "1st Experimentation Day" of the PESCO project "Automated Modeling, Identification and Damage Assessment of Urban Terrain" (AMIDA-UT),” translated by Google Translate, April 19, 2023, <https://www.exercito.pt/pt/informacao-publica/noticias/5425>.

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²⁷⁹ European Commission, European Defense Fund, *SPIDER*, June 26, 2023, https://defence-industry-space.ec.europa.eu/funding-and-grants/calls-proposals/result-edf-2022-calls-proposals_en.

²⁸⁰ European Defense Agency, “14 New PESCO Projects Launched.”

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