



The 19th International Scientific Conference
**“DEFENCE RESOURCES MANAGEMENT
IN THE 21st CENTURY”**
Braşov, November 7th-8th 2024



**EUROPEAN DEFENCE FUND AND PRECURSOR
PROGRAMS: IMPACT FOR THE BALTIC STATES**

Donatas Palavenis

Baltic Institute of Advanced Technology / DIAG / Vilnius / Lithuania

Abstract: EU is seeking greater autonomy and implementation of ambitious defence industry-related programs that would contribute to greater collaboration within the EU, market expansion, and technological novelty. European Defence Fund (EDF), which started in 2021, is the key to delivering cooperation in defence research and development (R&D). Before EDF, two precursor programs were executed (Preparatory Action on Defence Research (PADR) in 2017–2019 and European Defence Industrial Development Programme (EDIDP) in 2019–2020). Thus, the situation opens a unique opportunity for companies and institutions to grow competencies in the defence industry and enable the national armed forces to achieve significant technological superiority. The study aims to explore Baltic states (Estonia, Latvia, and Lithuania) participation results in PADR, EDIDP and EDF programs (2017–2023) and their effect on participants' growth. The results indicate that participants from the Baltic states are very active in programs (36%), are eager to coordinate multinational projects (1-2/year), and are well nested with EU OEMs. Grants received from the EU greatly impacted the 3B entities' revenues and workforce rapid growth.

Key words: EDF, PADR, EDIDP, DG DEFIS, Estonia, Latvia, Lithuania, defence industry.

1. Introduction

Baltic states (3B) are at the NATO and EU forefront, bordering the Russian Federation and its closest ally, Belorussia. In parallel to increasing defence budgets and straightening of armed forces, 3B seek to develop an indigenous defence industry, which could enable more advanced and capable national forces and contribute to the state's economic growth by generating exports of defence or dual-use products and services. Companies and institutions working in the defence sector recognise the importance of novelty and innovation and, therefore, are investing in R&D. Similar to 3Bs' views, the EU is aiming to bolster innovations in the defence industry field while financing R&D through multiple programs. EDF, which started in 2021 and would run until 2027, PADR and EDIDP are the main EU tools to facilitate defence R&D. Programs are extremely successful as they attract plenty of proposals each year, although it remains unclear if they are working in favour of small EU members including 3B.

The study aims to explore the participation results of the 3B in PADR, EDIDP, and EDF programs (2017–2023), and the effect on participants' growth. So far, the topic has not attracted any scholar's attention, with exception being EDF and precursory programs which were analysed by Francesco Giumelli and Marlene Marx (2023), Michal Piechowicz and Donatas Palavenis (2023), Calle Håkansson (2021), Ester Sabatino (2022), Catherine Hoeffler (2023), Keith Hartley (2024), Daniel Fiott (2024) and others.

The study is structured in four parts. The first three are devoted to providing background information on PADR, EDIDP, and EDF programs and participation results of actors from 3B. The fourth discussion part is devoted to focus analysis through leading participant profiling.

EUROPEAN DEFENCE FUND AND PRECURSOR PROGRAMS: IMPACT FOR THE BALTIC STATES

2. Preparatory Action on Defence Research

PADR (DG DEFIS, 2024a) funded 18 research projects in three years (2017–2019). In total, 90M euros (€) were provided at a 100% rate. The European Defence Agency coordinated the PADR implementation phase of 9 calls. Participants from 3B were engaged in a few projects (Table 1).

Project, call year	Entities from 3B	Remarks
OCEAN2020 (2017)	EST-Cybernetica / LTU-BPTI, Navy	Total EU contribution €35.4M, 43 partners, coordinated by Leonardo (ITA)
ACAMSII (2017)	LTU-FTMC	€2.6M, 7, FOI (SWE)
CROWN (2019)	LTU-BPTI	€9.9M, 11, Indra (ESP)
AIDED (2019)	LVA-SPH Engineering	€1.5M, 5, Space Applications Ser (BEL)
INTERACT (2019)	LTU-BPTI	€1.5M, 19, Fraunhofer (DEU)

Table 1. 3B participants in PADR

Participants from all three countries were engaged in various projects, with BPTI from Lithuania participating in three as the most. Interestingly, BPTI participated in projects led by different companies from different states. Governmental and private entities participated from 3B, thus indicating the state’s flexibility to adopt to EU regulations.

3. European Defence Industrial Development Programme

EDIDP (DG DEFIS, 2024b) focused on capability development and co-financing of joint defence technology development. In total, €500M were distributed with a 20-100% intensive rate for 42 projects throughout 2019–2020. There was a possibility of increasing the financing rate due to project references to PESCO and the higher involvement of SMEs. Entities from 3B were active as well, with Estonian companies being the most effective (Table 2).

Project, call year	Entities from 3B	Remarks
ESC2 (2019)	EST-GT Cyber Technologies	€20M, 17, Indra (ESP)
PEONEER (2019)	EST-Defsecintel Solutions / LTU-Elsis Pro	€7.2M, 10, E-Geos (ITA)
iMUGS (2019)	EST-Milrem, GT Cyber Technologies, Kaitsevāe Akadeemia / LVA-Latvijas Mobilais Telefons	€30.6M, 14, Milrem (EST)
ECYSAP (2019)	EST-Cybernetica	€10.9M, 9, Indra (ESP)
A14DEF (2020)	EST-Defsecintel Solutions / LVA-Tilde LTU-Elsis Pro	€5.7M, 19, Terma (DNK)
CARMENTA (2020)	LTU-BPTI	€8.1M, 14, Elettronica (ITA)
CYBER4DE (2020)	EST-GT Cyber Technologies / LTU-BPTI, NRD CS	€9.3M, 10, BPTI (LTU)
FAMOUS (2020)	EST-Cybernetica / LVA-Latvijas Mobilais Telefons	€9M, 19, Patria (FIN)
FIRES (2020)	LTU-Elsis Pro	€3.4M, 18, Nexter (FRA)
INTEGRAL (2020)	LTU-Elsis	€7.5M, 23, Vitrociset (ITA)
JEY-CUAS (2020)	EST-Marduk Technologies / LTU-BPTI	€13.5M, 38, Leonardo (ITA)
MIRICLE (2020)	LVA-Belss / EST-Cafa Tech	€8.9M, 18, Naval Group (BEL)
ODIN'S EYE (2020)	LTU-Elsis Pro	€7.5M, 27, OHB System (DEU)
PADIC (2020)	EST-Cafa Tech, Rantelon	€4.7M, 4, Saab (SWE)
SEANICE (2020)	LVA-Maritime Academy	€9M, 16, Thales (FRA)
VireTS (2020)	EST-VR Lab / LVA-Exonicus	€2.2M, 3, Exonicus (LVA)

Table 2. 3B participants in EDIDP

Each 3B state has one project that national entities coordinate, i.e., Estonian company MILREM coordinates a Multipurpose unmanned ground system project, Latvian company EXONICUS coordinates a project that seeks to develop a virtual reality trauma simulator, and Lithuanian private research institute BPTI coordinates a project that develops an easily deployable, modular and scalable cyber rapid response toolbox. Based on the number of participating entities, Estonia leads the list with 9, Latvia with 5, and Lithuanian with 4 entities. However, project-wise, Estonian entities participated in 11, Latvian in 5, and Lithuanian in 8 projects.

EUROPEAN DEFENCE FUND AND PRECURSOR PROGRAMS: IMPACT FOR THE BALTIC STATES

4. European Defence Fund

EDF (DG DEFIS, 2024c) has a budget of nearly €8B for 2021–2027, where €5.3B are foreseen for collaborative capability development and €2.7B for collaborative research in the defence field. Different funding rates apply for research (100%) and development (55%) projects. However, there is a bonus system for substantial SMEs, mid-caps, participation in consortiums and a bonus for connection with the PESCO project. Throughout the 7 years, 32–34 thematic categories are foreseen, which makes calls much more accessible. Similar to EDIDP, entities' engagement in EDF grows the same as the level of competition each year, which includes representatives from 3B (Table 3). The annual budget for EDF calls is around €1B.

Project, call year	Entities from 3B	Remarks
EURIGAMI (2021)	LTU-BPTI	€24.5M, 34, United Monolithic Semicond (DEU)
ARTURO (2021)	EST- Marduk Technologies / LTU-BPTI	€19.9M, 23, Leonardo (ITA)
FaRADAI (2021)	EST- Defsecintel Solutions / LVA-Riga Tech Uni / LTU-BPTI	€18.4M, 35, CERTH (GRE)
EU-GUARDIAN (2021)	EST- Cybernetica / LTU-BPTI	€13.4M, 10, Indra (ESP)
COMMANDS (2021)	LTU-BPTI	€24.8M, 21, SASA (ESP)
SDMMS (2021)	EST- Cybernetica / LVA- Cyber Circle / LTU-BPTI	€9.1M, 11, Cybernetica (EST)
LODESTAR (2021)	LTU-BPTI, ADOS-Tech	€3.7M, 5, Embedded Acoustics (NLD)
HIDRA (2021)	LTU-BPTI	€3.9M, 4, Beyond Semiconductor (SLO)
AMLTD (2021)	LTU- Aktyvus Photonics, FTMC	€2.8M, 5, Aktyvus Photonics (LTU)
5G COMPAD (2021)	EST- Cafa Tech / LVA- Latvijas Mobilais Telefons	€26.9M, 19, Saab (SWE)
dTHOR (2021)	EST- Cafa Tech	€14.5M, 35, Sintef (NOR)
INDY (2021)	EST- Cafa Tech	€14.2M, 20, Teces (SLO)
MoSaiC (2021)	EST- Cafa Tech	€4.4M, 9, SAFE (ITA)
EDOCC (2021)	EST- Defsecintel Solutions, Guardtime	€40M, 26, Airbus (DEU)
ACHILE (2021)	EST- Talgen Cybersecurity	€39.9M, 27, Safran (FRA)
NOMAD (2021)	EST- Skeleton Technologies	€19.6M, 19, ARPA (ESP)
TeChBioT (2021)	EST-Tallinn Tech Uni	€4.3M, 8, Ecole Royale Militaire (BEL)
FAMOUS2 (2021)	LVA- Latvijas Mobilais Telefons	€94.8M, 18, Patria (FIN)
ADEQUADE (2021)	LVA-Laser Center of Latvian Uni	€27.4M, 31, Thales (FRA)
SWAT-SHOAL (2022)	EST-Cafa Tech	€25M, 20, Navantia (ESP)
SPIDER (2022)	EST-Falconers, Spacewave, Tallin Tech Uni / LVA-DATI Group / LTU-NanoAvionics	€29.4M, 19, Airbus (FRA)
REACTS (2022)	LTU- NanoAvionics	€19.2M, 35, DZLR (DEU)
ODIN'S EYE II (2022)	LTU-Elsis Pro	€90M, 38, OHB System (DEU)
FEDERATES (2022)	EST-VR Lab / LVA-Exonicus LTU-BPTI	€29.5M, 32, Rheinmetall (DEU)
TIRESYAS (2022)	EST- Marduk Technologies LTU-BPTI	€14.9M, 25, Leonardo (ITA)
EUROGUARD (2022)	EST-MardukTechnologies, Baltic Workboats	€65M, 23, Baltic Workboats (EST)
E-NACSOS (2022)	EST-Cafa Tech	€64.9M, 20, Naval Group (FRA)
iMEDCAP (2022)	EST-MAWI Solutions, Milrem	€24.8M, 22, München Tech Uni (DEU)
SESIOP (2022)	LTU-Elsis Pro	€18.8M, 20, Airbus (FRA)
EC2 (2022)	EST-Cafa Tech, Talgen Cybersecurity	€30M, 21, Indra (ESP)
LATACC (2022)	EST- Milrem / LTU-BPTI	€48.7M, 30, Thales (FRA)
THEMA (2022)	EST-MardukTechnologies	€14.9M, 14, Nexter (FRA)
ACROSS (2022)	LTU-FTMC	€14.9M, 18, CTITVP (PRT)
DeterMine (2022)	EST-Milrem	€4.9M, 8, PIAP (POL)
STORE (2022)	EST-Cybernetica, Falconers, Marduk Technologies	€23.2M, 20, Thales (FRA)
NEWSROOM (2022)	EST-CybexerTechnologies, CR14	€9.9M, 17, AIT (AUS)
FACT (2022)	EST-CR14 / LVA-Latvijas Mobilais Telefons / LTU-BPTI	€26.9M, 19, Kongsberg (NOR)

EUROPEAN DEFENCE FUND AND PRECURSOR PROGRAMS: IMPACT FOR THE BALTIC STATES

EUCINF (2022)	EST-Cybernetica / LVA-Tilde	€32.9M, 22, Airbus (FRA)
REACTII (2022)	EST- Cafa Tech, Rantelon / LTU-BPTI	€40M, 19, Indra (ESP)
LACE (2023)	LTU-Eksma Optics, Lidaris	€3.9M, 11, CND (ITA)
BODYGUARD (2023)	LVA-Photonic	€6.4M, 12, Agenium Space (FRA)
CALIPSO (2023)	EST-Cafa Tech	€24.9M, 30, NCSR Demokritos (GRE)
RESILIENCE (2023)	LVA-Latvijas Uni, Rigas Stradina Uni	€24.9M, 44, CEAEA (FRA)
HSM4COM (2023)	EST-Defsecintel Solutions, Skudo	€3M, 7, EIDON AE (GRE)
SWARM-C3 (2023)	EST-Wayren	€3.9M, 5, Teknologian Tutkimuskeskus (FIN)
TALOS-TWO (2023)	LTU-Altechna Sensing	€25M, 17, CILAS(FRA)
LINGUARISE-DC (2023)	LVA-Tilde	€5.9M, 16, IEPYA (GRE)
EequalMCM (2023)	LVA-Belss / LTU-BPTI	€44.9M, 16, Naval Group (BEL)
EISNET (2023)	EST-Cafa Tech	€26.3M, 23, Thales (FRA)
MARTE (2023)	EST-Cafa Tech, Rantelon, Wayren / LTU-BPTI	€19.9M, 47, Marte ARGE (DEU)
FIRES 2 (2023)	LTU-Elsis Pro	€26.9M, 21, Nexter Munitions (FRA)
ECYSAP EYE (2023)	EST-Cybernetica	€20M, 16, Indra (ESP)
AIDA (2023)	EST-CR14, Sorainen	€26M, 24, CR14 (EST)
CARMENTA PF (2023)	LTU-BPTI	€32.9M, 15, Elettronica (ITA)
E-CUAS (2023)	EST-Marduk Technologies / LTU-BPTI	€43M, 24, Leonardo (ITA)
BadB (2023)	EST-KrattWorks, KappaZeta	€5.7M, 4, KrattWorks (EST)

Table 3. 3B entities engaged in EDF (2021–2023)

Estonian entities are the most active participants in EDF, followed by Lithuania. Latvian companies are the most hesitant to participate, although governmental institutions comprise most participants

5. Discussion

It is evident from participation data that 3B entities become very active in EDF following successful participation in preparatory programs. The participation rate exceeds the median of small EU states. Therefore, assessing whether 3B entities had tangible benefits from participation in EDF and precursor programs is essential. In this study, a few variables are assessed, firstly, if there is a shift in personnel and revenues from the year of first engagement in the EU defence project till 2023. Secondly, the participant's relationship with the project coordinator will be examined to note if relationships were stable, if the same coordinator led other projects, or if entities built new connections (Table 4).

Company	PADR		EDIDP		EDF			Personnel	Revenue
	2017	2019	2019	2020	2021	2022	2023		
EST-Cybernetica	1(Leonardo)*		1(Indra)	1(Patria)	2(Indra,Cybernetica)	2(Thales,Airbus)	1(Indra)	+76%	+137%
EST-GT Cyber Technologies			2(Indra,Milrem)	1(BPTI)				No data	No data
EST-Defsecintel Solutions			1(E-Geos)	1(Terna)	2(CERTH,Airbus)		1(EIDON AE)	+583%	+4000%
EST-Milrem			1(Milrem)			3(MünchenTechUni,Thales,PIAP)		+85%	+900%
EST-Kaitseväe Akadeemia			1(Milrem)					No data	No data
EST-Marduk Technologies				1(Leonardo)	1(Leonardo)	4(Leonardo,BalticWorkboats,Nexter,Thales)	1(Leonardo)	+18%	+247%
EST-Cafa Tech				2(NavalGroup,Saab)	3(Saab,Sintef,Teces,SAFE)	4(Navantia,NavalGroup,Indra)	3(NCSRDemokritos,Thales,MarteARGE)	+700%	+616%
EST-Rantelon				1(Saab)		1(Indra)	1(MarteARGE)	+22%	+200%
EST-VR Lab				1(Exonicus)		1(Rheinmetall)		No data	No data
EST-Guardtime					1(Airbus)			-11%	+133%
EST-Talgen Cybersecurity					1(Safran)	1(Indra)		-30%	+7600%

**EUROPEAN DEFENCE FUND AND PRECURSOR PROGRAMS:
IMPACT FOR THE BALTIC STATES**

EST-Skeleton Technologies					1(ARPA)				+85%	+117%
EST-Tallinn Tech Uni					1(EcoleRoyaleMilitaire)	1(Airbus)			No data	No data
EST-Falconers						2(Airbus,Thalases)			+400%	+6000%
EST-Spacewave						1(Airbus)			+200%	-200%
EST-Baltic Workboats						1(BalticWorkboats)			-7%	-10%
EST-MAWI Solutions						1(MünchenTechUni)			No data	No data
EST-CyberexTechnologies						1(AIT)			+28%	+352%
EST-CR14						2(AIT,Kongsberg)	1(CR14)		+42%	+260%
EST-Skudo							1(EIDONAE)		N.A.	N.A.
EST-Wayren							2(TeknologiānTutkimuskeskus,MarteARGE)		N.A.	N.A.
EST-Sorainen							1(CR14)		N.A.	N.A.
EST-KrattWorks							1(KrattWorks)		N.A.	N.A.
EST- KappaZeta							1(KrattWorks)		N.A.	N.A.
LVA-SPH Engineering		1(Space Applications)							No data	No data
LVA-Latvijas Mobilais Telefons			1(Milrem)	1(Patria)	2(Saab,Patria)	1(Kongsberg)			No data	No data
LVA-Tilde				1(Terma)		1(Airbus)	1(IEPYA)		No data	No data
LVA-Belss				1(NavalGroup)			1(NavalGroup)		No data	No data
LVA-Maritime Academy				1(Thales)					No data	No data
LVA-Exonicus				1(Exonicus)			1(Rheinmetall)		No data	No data
LVA-Riga Tech Uni						1(CERTH)			No data	No data
LVA- Cyber Circle						1(Cybermetica)			No data	No data
LVA-Laser Center of Latvian Uni						1(Thales)			No data	No data
LVA-DATI Group							1(Airbus)		No data	No data
LVA-Photonic							1(AgeniumSpace)		N.A.	N.A.
LVA-Latvijas Uni							1(CEAEA)		N.A.	N.A.
LVA-Rigas Stradina Uni							1(CEAEA)		N.A.	N.A.
LTU-BPTI	1(Leonardo)	2(Indra,Fraunhofer)		3(Electronica,BPTI,Leonardo)	8(UMS,Leonardo,CERTH, Indra,SASA, Cybernetica,EmbeddedAcoustics,BeyondSemiconductor)	4(Rheinmetall,Leonardo,Thales,Kongsberg,Indra)	4(NavalGroup,MarteARGE,Electronica,Leonardo)		+30%	+260%
LTU-FTMC	1(FOI)				1(AktyvusPhotonics)	1(CTITVP)			+8%	No data
LTU-Elsis Pro			1(E-Geos)	3(Terma,Nexter,OHB System)		2(OHBSystem,Airbus)	1(Nexter)		+55%	+190%
LTU-NRD CS				1(BPTI)					+258%	+228%
LTU-Elsis				1(Vitrociset)					-8%	-5%
ADOS-Tech					1(EmbeddedAcoustics)				+316%	+330%
LTU-Aktyvus Photonics					1(AktyvusPhotonics)				+2300%	+4000%
LTU-NanoAvionics						2(Airbus,DZLR)			+500%	+42%
LTU-Eksma Optics							1(CND)		N.A.	N.A.
LTU-Lidaris							1(CND)		N.A.	N.A.
LTU-Altechna Sensing							1(CILAS)		N.A.	N.A.

*-number of projects implemented (coordinator)

Table 4. 3B entities' in EU defence initiatives (inforegister.ee; rekvizitai.vz.lt)

Most 3B entities engaged in EDF or precursory programs have benefited from EU support. Firstly, there are increased revenues and workforce. Secondly, in growing cooperation venues and continuously participating in other calls. Thirdly, it is essential to sustain good relationships among consortium members and with project coordinator, find new venues, and build long-term relations with OEM and Tier 1 companies.

EUROPEAN DEFENCE FUND AND PRECURSOR PROGRAMS: IMPACT FOR THE BALTIC STATES

6. Conclusion

3B entities maintained a strong presence in EDF and precursor programs, with participation rates of 40% for PADR2017, 30% for PADR2019, 25% for EDIDP2019, 46% for EDIDP2020, 31% for EDF2021, 49% for EDF2022, and 31% for EDF2023.

3B entities are eager to coordinate projects with multiple stakeholders: EDIDP2019–1, EDIDP2020–1, EDF2021–2, EDF2022–1, and EDF2023–2. Interestingly, the majority of entities with this ambition come from Estonia.

Most of the 3B entities participating in projects are linked with EU OEMs, e.g., Leonardo, Airbus, Rheinmetall, Thales, Kongsberg, Indra, and Saab, which could help showcase their competencies and credibility, and could allow for follow-on cooperation in other EU and NATO projects.

At the same time, PADR, EDIDP, and EDF made a significant contribution and enabled most of the 3B entities to grow rapidly in revenue (42–2300%) and manpower (8–7600%). Only a few entities, 2-3 years later, had decreasing revenue and manpower figures.

As participation interest in EDF grows, it becomes more challenging for participants, including entities from 3B, to ensure victory. Consortiums with multiple entities, broader state representation, and continuous projects may be better selected. Nevertheless, proposal quality and innovative spirit are the keys to success.

References:

- [1] DG DEFIS. (2024a). Preparatory Action on Defence Research (PADR). Available at: https://defence-industry-space.ec.europa.eu/eu-defence-industry/preparatory-action-defence-research-padr_en
- [2] DG DEFIS. (2024b). European Defence Industrial Development Program (EDIDP). Available at: https://defence-industry-space.ec.europa.eu/eu-defence-industry/european-defence-industrial-development-programme-edidp_en
- [3] DG DEFIS. (2024c). EDF, developing tomorrow's defence capabilities. Available at: https://defence-industry-space.ec.europa.eu/eu-defence-industry/european-defence-fund-edf-official-webpage-european-commission_en
- [4] Fiott, D. (2024). From Liberalisation to Industrial Policy: Towards a Geoeconomic Turn in the European Defence Market? *Journal of Common Market Studies*. <https://doi.org/10.1111/jcms.13600>
- [5] Giumelli, F., & Marx, M. (2023). The European Defence Fund precursor programmes and the state of the European market for defence. *Defence Studies*, 23(4), 589–607. <https://doi.org/10.1080/14702436.2023.2277440>
- [6] Håkansson, C. (2021). The European Commission's new role in EU security and defence cooperation: the case of the European Defence Fund. *European Security*, 30(4), 589–608. <https://doi.org/10.1080/09662839.2021.1906229>
- [7] Hartley, K. (2023). European Defence Policy: Prospects and Challenges. *Defence and Peace Economics*, 35(4), 504–515. <https://doi.org/10.1080/10242694.2023.2185425>
- [8] Hoeffler, C. (2023). Beyond the regulatory state? The European Defence Fund and national military capacities. *Journal of European Public Policy*, 30(7), 1281–1304. <https://doi.org/10.1080/13501763.2023.2174581>
- [9] Piechowicz, M., & Palavenis, D. (2023). Lithuanian-Polish security cooperation in European Union (EU) Defence Programs. *Stosunki Międzynarodowe–International Relations*, 3(10). <https://doi.org/10.12688/stomiedintrelat.17712.1>
- [10] Sabatino, E. (2022). The European defence fund: a step towards a single market for defence? *Journal of European Integration*, 44(1), 133–148. <https://doi.org/10.1080/07036337.2021.2011264>