

EDM

EUROPEAN DEFENCE MATTERS

Investing in European defence

Today's promises,
tomorrow's capabilities?



> COVER STORY

German Minister
Lambrecht on
defence spending

> THE UKRAINIAN VIEW

Ukraine's
ambassador on
winning the war

> SUPPORT FOR UKRAINE

The head of the
European Peace
Facility

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THE TIME TO COLLABORATE IS NOW

It is happening. And for those who remember the defence budget cuts after the global financial crisis, it couldn't come sooner. Defence spending is rising again. Within the EU, it grew to €214 billion in 2021, a 6% increase compared to 2020, the strongest yearly growth rate since the rebound started in 2015.

According to European Defence Agency (EDA) data, spending is set to grow by up to €70 billion by 2025, as Russia's invasion of Ukraine forces a paradigm shift in Europe's foreign and defence policy.

But the question remains: is Russia's war in Ukraine finally pushing EU Member States to cooperate on defence, or are they cooking up an alphabet soup of extra bureaucracy and about to waste a lot of resources?

This edition of *European Defence Matters* will try to help answer that. In "Investing in European Defence", we debate the issue with the German and Estonian Ministers of Defence, the Czech Deputy Minister of Defence, the CEO of Rheinmetall, get the critical view of a think-tanker and also shine a spotlight on the European Peace Facility. We hear from the Ukrainian Ambassador to the EU, as well as the Head of EDA, Josep Borrell, among others.

As Ukrainians fight for their survival, there will be no peace at Christmas in Europe this year. But Borrell's call to EU action should be taken seriously.

EDA, as the prime forum for EU defence cooperation, knows the work to be done. Former European Commission President Jean-Claude Juncker said in 2015 that: "If I look at the common European defence policy, a bunch of chickens would be a more unified combat unit." With a long list of missed opportunities, European defence cooperation is finally gaining momentum.

After several years of net zero growth, EDA's budget will rise 15% next year. The EU has a new defence and foreign policy concept, a 'Strategic Compass'. Denmark voted in a referendum to end its opt-out from EU defence policy, and once-neutral Finland and Sweden have applied to join NATO. If Germany can pass a constitutional amendment to approve a €100 billion defence spending programme, surely anything is possible.

European Defence Matters is changing too. Former Reuters diplomatic correspondent Robin Emmott takes over the helm as the new Editor-in-Chief. So welcome to Robin's first issue. We hope you find it valuable – and an enjoyable read.

Elisabeth Schoeffmann
EDA Head of Media & Communication

Robin Emmott
Editor-in-Chief





EDA Chief Executive Jiří Šedivý confers with High Representative Borrell during the Agency Steering Board meeting on 15 November 2022.

INTENSIFYING EUROPEAN DEFENCE COLLABORATION AT A TIME OF WAR

A tireless supporter of European integration, the Head of the European Defence Agency (EDA), High Representative/Commission Vice-President **Josep Borrell**, analyses what Russia's invasion of Ukraine means for EU defence collaboration. As EDA's role grows, supported by a historic budget increase for 2023, Borrell urges EU Member States to put aside national differences and work together to avoid wasting an opportunity to cooperate as defence spending rises again.

When I started my term as High Representative in 2019, I regularly told hesitant EU leaders and lawmakers that the European Union needed to learn to speak the "language of power". We need to be able to act on the world stage, not just express concern. We are a bloc of 450 million people with an economic output nine times larger than Russia. Collectively we spend almost three times more than Moscow on defence but it was as if the EU had forgotten its collective power.

However, if Europe was often half-hearted in security policy before, Russia's barbaric invasion of Ukraine has changed many minds and shown what we can do. Cohesive in our aims and coordinated in our approach, we have agreed tough sanctions on Russia, granted Ukraine EU candidate status, opened our doors to Ukrainian

refugees, set up a training programme for Ukraine's armed forces and helped finance arms to Ukraine through the European Peace Facility. Member States have made crucial deliveries of weapons and ammunition to Kyiv.

But, it is still by no means enough. Europe is in danger. Russia, which has common borders with five EU countries, is waging a brutal war of aggression against Ukraine, neighbour to four EU countries. The Russian leadership is openly seeking to divide the EU, fight our democratic values and destroy Europe's security. The post-Cold War order, with reduced defence spending and the United States taking the lead on Europe's security, does not exist any more. We must do more for our own defence. However, we must not only do more, we must do it better: either we overcome longstanding national

goals to collaborate in defence or we repeat the duplication of the past and waste our resources.

EDA and the European Commission have recently highlighted our defence investment gaps. The latest EDA data shows that, in 2021, Member States allocated 18% of their spending for new equipment to European collaborative procurement projects – still below the benchmark of 35%. While defence expenditure rose 6% in 2021, there is still the temptation for Member States to protect national defence industries or simply purchase off-the-shelf products. Despite understandable differences between our Member States, we must remain united where it really matters and not allow a string of carve-outs and projects at the national level to undermine our common defence industrial strategy.



"The post-Cold War order, with reduced defence spending and the United States taking the lead on Europe's security, does not exist any more"

High Representative Josep Borrell and Commission President Ursula von der Leyen visit the liberated city of Bucha in Ukraine, 7 April 2022.

The Strategic Compass, our overarching plan to define future threats and ambitions in defence, provides a common sense of purpose to our response. It sets out new ways to improve our collective ability to defend our citizens and specifies clear milestones to measure progress. We need to reinforce our civilian and military missions and operations, develop an EU Rapid Deployment Capacity to be able to swiftly deploy up to 5,000 troops in times of crisis, to strengthen our command and control, to boost our intelligence capacities, to develop our cyber defences and to fill our capability gaps.

Member States have just approved a 15% increase in the EDA budget for 2023, reflecting our higher level of ambition for the agency in support of growing national defence efforts. We must build on two decades of defence collaboration and harness the power that could come from our collective action to sustain our EU defence industrial base.

Charting a path out of the storm

Progress is underway. The Permanent Structured Cooperation (PESCO) has promising projects, such as the European Patrol Corvette, the Cyber Rapid Response

Team and Future Medium-Size Tactical Cargo. The creation of EDA's Hub for European Defence Innovation (HEDI) has been a first deliverable of the Strategic Compass. EDA's work with Member States to review the Capability Development Plan (CDP) in 2023 is of huge importance just as a new NATO Defence Planning Process (NDPP) gets underway.

The Commission too is trying to reduce barriers to working together by providing financial incentives to cooperation, such as the European Defence Industry Reinforcement through common Procurement Act (EDIRPA). The EU Defence Investment Programme (EDIP) regulation is set to allow a VAT exemption if at least three Member States buy capabilities developed collaboratively within the EU. The European Defence Fund (EDF), launched in 2017, supports collaborative defence research and development projects.

We have the responsibility to shape a credible, sustained European defence together. The future of European security is in our hands. 

"WE HAVE REACHED A DEFINING MOMENT IN OUR SUPPORT FOR UKRAINE"

In her post since December 2021, **Christine Lambrecht** is Germany's Federal Minister of Defence. A former justice minister, as well as family affairs minister, she is a lawyer and served as a member of the Bundestag – the national parliament of the Federal Republic of Germany – between 1998 and 2021. She speaks to *European Defence Matters* about close coordination within the EU and NATO, Russian atrocities in Ukraine and how France and Germany have a special cooperation.

What does Chancellor Olaf Scholz's decision to inject €100 billion into the armed forces mean for Europe?

Our security architecture changed dramatically on 24 February 2022. Russia's war of aggression against Ukraine constitutes a fundamental violation of a country's sovereignty and integrity and of the international rules-based order. As Chancellor Scholz said in the Bundestag on that very 27 February, we are facing a turning point in security policy, a "Zeitenwende". This Zeitenwende calls for decisive action. This includes the additional investment of €100 billion in the Bundeswehr to respond adequately to the drastic changes that affect all of Europe.

This underlines the fact that Germany is ready and willing to invest more in its security – and thereby in European security – because of its central geographical position in Europe, its economic strength and its political weight. In this context, we intend to pursue cooperation within the European Union wherever possible. One of our goals, of course, is to strengthen the defence industrial base. But this is not an end in itself. Our priorities are

interoperability, rapid resupply capability and price optimisation through large-scale production and workloads. With regard to the special fund of €100 billion, it is important to act swiftly and rapidly to strengthen Bundeswehr capabilities both for Europe and within NATO. To this end, it provides for expenses to enhance our command-and-control capability and expedite our digital transformation and to procure combat aircraft, heavy transport helicopters, personal protective equipment for service personnel, infantry fighting vehicles and the new frigate 126. This will enable the Bundeswehr to take a further step towards a broad and innovation-oriented capability spectrum.

However, the special fund should not be discussed in isolation. Additional projects will be implemented via the annual budget. With a view to our security in Europe, we are, for example, prioritising the topic of ammunition.

Let me emphasise once again: joint planning, development and procurement are very important to us. This is particularly true where they lead to acceleration,



Germany's Minister of Defence, Christine Lambrecht, learns

enabling us to respond quickly and jointly to threats and protect Germany and its allies. Germany's additional contributions, like those of any other partner, contribute to strengthening Europe and the European pillar of NATO. In this context, the European Sky Shield Initiative (ESSI), an initiative for a European ground-based air defence that Chancellor Scholz announced in Prague, was conceived. It aims to achieve economic, military and technological synergies and sends a strong message of European loyalty to the NATO alliance.

Some say there is no money in the fund earmarked for European collaboration. Is that correct?

In the Strategic Compass we all emphasised the need to close critical capability gaps in European defence more quickly, enhance the interoperability of Europe's armed forces and strengthen the defence industry in Europe. I believe that it is particularly important to strengthen EU defence initiatives and capability planning instruments and their coherence and to address and implement strategic armaments cooperation projects of EU Member States across all domains together. This also requires the willingness



© Bundeswehr/Tom Twardy

about the military situation during a visit to the port city of Odesa, Ukraine, 1 October 2022.

"Our declared goal is to make sure that Franco-German cooperation on defence, especially in the field of armaments, is a joint effort that leads to successes"

to compromise in order to accelerate developments and their implementation. Pressing situations such as we are currently experiencing may also require us to procure commercially available systems in order to quickly close existing gaps.

Nevertheless, we are always very committed to cooperation as our common goal. We are using the special fund for projects that are designed to close existing, pressing capability gaps in the Bundeswehr as quickly as possible. This involves paying attention to the market and

the time. We certainly seek to work together within the European framework wherever possible and reasonable. The European joint projects Main Ground Combat System (MGCS) and Future Combat Air System (FCAS), for instance, are also represented in the special fund. Additionally, we continue to actively advance projects within the Permanent Structured Cooperation (PESCO) framework, as our latest proposals – Anti-Torpedo-Torpedo and Future Short Range Air-to-Air Missile – show. In this respect, it always pays to take a closer look and see the full picture.

What are the obstacles to more EU defence collaboration? Can you offer any solutions?

As the Strategic Compass clearly states, EU defence cooperation needs to be enhanced to substantiate the credibility of the EU as a security player. To this end, we need more European cooperation in the short, medium and long-term and the latest Coordinated Annual Review of Defence (CARD) report prepared under the direction of the European Defence Agency (EDA) made this clear. We must better implement the recommendations that are already on the table. Given that there are

27 sovereign Member States with their own evolved structures and defence industries and indeed their own interests, this is quite challenging, albeit still necessary.

In concrete terms, we must further increase our cooperation in defence planning, development, procurement, operation, maintenance and innovation. EU defence initiatives must be used to the best possible extent and their coherence must be improved. As a means to intensify European armaments cooperation in the future, it is conceivable, for example, to use and further develop OCCAR as a central instrument, provided that there is a clear definition of tasks to avoid overlap with the other agencies such as EDA and (NATO's) NSPA.

Close coordination with NATO as the cornerstone of collective defence is indispensable in this context, especially in view of the fact that 23 EU Member States are also NATO allies. Each Member State can only provide one 'single set of forces' for all tasks. Any effort to equip the armed forces in accordance with their mission will therefore strengthen both the EU and NATO. Nevertheless, the prerequisite is still that →



Christine Lambrecht talks to General Robert Brieger, Chairman of the European Union Military Committee in Brussels on 17 May 2022.

multinational considerations are taken into account with regard to each Member State's national capability developments in order to avoid duplication.

What is the future of Franco-German defence cooperation? What are the next steps in the Next Generation Weapon System (NGWS) in a Future Combat Air System (FCAS)?

Franco-German cooperation has grown and become strong on the basis of our common interests and shared values. Today, it is normal in all areas and across all levels: service personnel participate in exchange programmes and joint training, they serve in integrated staff and force structures at home and abroad, they coordinate their work in various informal and formal bodies; we are developing and procuring the capabilities of tomorrow together.

This special cooperation is also reflected in the field of armaments cooperation, which includes the aforementioned projects such as the Next Generation Weapon System (NGWS) in a Future Combat Air System

(FCAS), which is a tri-national endeavour with France and Spain. The plan is to begin the next technology phase for NGWS this year. The objective is still to activate this system of systems in 2040. Until then, plans include the demonstration phases for the required technologies and subsequent development of the system. A multitude of central technologies such as sensor systems, communication, networking and encryption must be further developed in order to allow the capabilities of the overall system to become effective. From today's point of view, this is a long road with many challenges, and we will continue to face them proactively over the course of this armament programme. After all, this is more than just a project. This is also about the sovereignty and future viability of Europe in the high-tech fields of aircraft manufacturing and the defence industry.

Our declared goal is to make sure that Franco-German cooperation on defence, especially in the field of armaments, is a joint effort that leads to successes.

What are the advantages of buying off-the-shelf equipment from the United States?

The Russian war of aggression against Ukraine has shown that we must be able to act quickly. This especially includes rapid procurement. We can only achieve this if we buy what is commercially available. This does not contradict cooperative capability development and we are not renouncing our common goals and commitments, for example in PESCO. It just means facing certain realities: there are current threats and we must take measures to counter them today. Rapid procurement of commercially available goods where necessary, and joint capability development within the EU framework where possible, are two approaches that are complementary and essential to our credibility.

However, some of the capability requirements we have defined for the Bundeswehr are either only met by U.S. products at present or the capabilities can only be procured in a timely manner in the United States. We consider procurement from our partners and friends in NATO a

"Germany is ready and willing to invest more in its security - and thereby in European security"

completely normal process. This is one of the reasons why we want to give our partners and friends, especially the United States, a range of opportunities to participate in EU initiatives.

Beyond the immediate need for more weapons, how can the European defence industrial base be maintained and strengthened?

As laid out in the Strategic Compass, all 27 Member States have decided to strengthen the EU's defence technology and industry base, both on the demand side and the supply side, to make it more competitive in the long-term and in a sustainable fashion. The EU already has defence initiatives such as CARD, PESCO and the European Defence Fund (EDF). We are looking to further improve the coherence of these initiatives and make better use of the incentives that are on the table. With this in mind, we welcome the defence investment gap analysis published in May 2022, to which EDA contributed substantially. We are involved in the Defence Joint Procurement Task Force and we are making constructive contributions to the design of other proposed instruments, for example European Defence Industry Reinforcement through common Procurement Act (EDIRPA). As long as those are designed properly, I am hoping they will provide impulses to strengthen the EU's defence technology and industry base.

How best can Germany and the EU work together to ensure Ukraine's defence forces continue to modernise?

Our joint efforts have succeeded in strengthening Ukraine, enabling it to counter Russia's illegal and unprovoked aggression. I am deeply convinced that it would have been virtually impossible to ward off Russia's attack on Kyiv without our joint



The commander of the German mission contingent, Lieutenant Colonel Daniel Andrae, speaks to Christine Lambrecht during their NATO mission in Lithuania, on 22 February 2022.

support. In addition, our sustained military support, including anti-tank, artillery and air defence systems, was instrumental for Ukraine in regaining control of Kharkiv and Kherson.

Germany plays a leading role by supplying Ukraine with weapons and equipment from Bundeswehr stocks and in close cooperation with our partners in industry. For example, we provided Ukraine with the most modern IRIS-T air defence.

We will continue our support for Ukraine, but we must also remain realistic, seeing as this will also significantly impact our own forces. As the Bundeswehr's stocks reach their limits, we have been working more closely with our partners in industry in order to support Ukraine with materiel sourced from the defence industry. In doing so, we are able to ensure Germany's continued military support for Ukraine. Our international partners are in a similar situation.

I feel that we have reached a defining moment in our support for Ukraine, one in which close international coordination will be essential. We are already seeing the positive effects of this coordination at the European level. A case in point is the harmonisation of the software packages for the PzH 2000 howitzers provided to Ukraine in a joint effort by Germany and

the Netherlands. This starting point should also guide our future cooperation and development at the European level: fewer granular individual solutions and more interoperable and interchangeable systems. Another important step is the decision to set up the EUMAM Ukraine. EUMAM Ukraine establishes a framework for providing thorough training to Ukraine's armed forces, which will also have a positive impact on our continued support and future cooperation.

Do you see any end to the war in Ukraine?

Ukraine and Russia could initiate negotiations as early as tomorrow if Russia were to put an end to its aggression and withdraw its armed forces to its own territory.

I was in Ukraine a few weeks ago and saw with my own eyes the destruction and the suffering inflicted mainly on defenceless and non-participating civilians. It is an atrocity to terrorise the Ukrainian citizens with constant attacks on critical infrastructure that is necessary for the survival of the population, especially in the coming winter months.

In a nutshell: If Russia understands that we will not abandon our support for Ukraine and that we will not allow Russia to drive a wedge between us and Ukraine, it will be more likely that peace becomes possible. **K**



EUROPE NEEDS TO BE A STRONGER AND MORE CAPABLE PILLAR OF NATO'S COLLECTIVE DEFENCE

Jan Jireš, the Czech Republic's Deputy Minister of Defence for Defence Policy and Planning, discusses the EU's role in strengthening and enabling the Atlantic alliance, the challenges of joint procurement – and why buying off-the-shelf equipment is not a problem.

At the beginning of 2022, as Russia continued its massive troop build-up on Ukraine's borders, the Czech government was thinking ahead. Even though Russia denied it was planning an invasion of its neighbour, the Czech cabinet immediately reacted to Kyiv's request for support and approved a shipment of 152mm calibre ammunition to Ukraine. It was the first of many donations made by Prague.

"Helping the invaded country is a strategic priority for the Czech Republic, as we understand that by supporting Ukraine, we protect the whole of Europe," says Deputy Minister Jireš. It was also one of the main priorities of the Czech presidency of the Council of the European Union, which the Czech Republic ran in the second half of 2022. Thanks in part to this, support to Ukraine remains the main focus of the EU as a whole.

The fact that Prague was one of the first Western capitals to provide continued military support to Ukraine did not go unnoticed. It was recognised by the United States, as Washington announced in August that it would provide the Czech Republic with eight AH-1Z and UH-1Y helicopters for free, except for transfer and upgrades. "We have to get rid of the legacy Soviet-made

military equipment," says Jireš. "To a large extent, this has already been achieved, but not entirely. Our support to Ukraine has accelerated this process. Of course, our primary motivation in helping Ukraine is to provide it with the means needed for defence against Russia's brutal aggression. But the fact is that, as a by-product, it will lead to an increased interoperability of NATO allies and EU members in the end."

Now, as the impetus grows to replenish European military stocks exhausted by supplying equipment to Ukraine, the Czech EU presidency has been instrumental in laying the groundwork for a new tool known as the European Defence Industry Reinforcement through common Procurement Act (EDIRPA). Already well-versed in joint procurement, the Czech Republic bought ammunition under an arrangement between the European Defence Agency (EDA) and Estonia, Latvia, Lithuania, the Czech Republic, and Poland in April 2013 for the 'Carl-Gustaf' recoilless anti-tank weapon.

"Joint procurement can be a useful approach in specific cases. It may bring economies of scale, boost the leverage of smaller customers vis-à-vis large producers, and help increase interoperability. After all, we have experience with joint procurement in

NATO through its procurement agency NSPA, which means we are well aware of both pros and cons," he says. "EDIRPA is a promising instrument. But it will only have a limited impact on Europe's military capabilities," the Deputy Minister cautions. He adds that "there are a number of obstacles at the national level – political, technical, legislative, procedural, even mental – that we may never be able or willing to remove."

EU and NATO countries need to work on addressing key capability gaps required, in the first place, for collective defence, with the NATO Defence Planning Process being vital for the defence of Europe. In his opinion, filling capability gaps "is certainly realistic, but it won't be achieved right away, and it won't happen across the whole capabilities spectrum." He points to examples where collaboration is working, notably in strategic airlift. The Multi Role Tanker Transport (MRTT) project, which brings a European aircraft capable of aerial refuelling, is "a good example of cross-organisational and cross-agency cooperation."

Transatlantic bond

As EU presidency chair, the Czech Republic has been clear that all these goals must be in tandem with the United States and with NATO. "We have to realise that we are not



© Oleksandr Ratushniak / UNDP Ukraine

A man walks through the destroyed village of Novoselivka, near Chernihiv, in Ukraine, 11 April 2022.

building a 'fortress Europe'. We have to be stronger to be able to bear a larger share of the burden in transatlantic security and defence. Europeans must assume greater responsibility. The war in Ukraine again demonstrated that NATO is absolutely indispensable and that the EU's main role in defence and security should be facilitating and enabling NATO's collective defence, be it through contributing to military mobility or by supporting the resilience of European nations," Deputy Minister Jireš says.

Assuming greater responsibility in security and defence also means that Europeans may one day soon need to intervene militarily in their neighbourhood in a crisis without being able to rely on U.S. troops. "In this sense, Europeans should focus on specific priority areas where Europe needs to be able to act on its own without unnecessarily burdening the United States," Jireš says. However, he warns that these efforts must not be motivated by an attempt at building a "European army".

In that vein, the Czechs' EU presidency sees the onus being on quick and practical wins. The European Commission and EDA's work

"Europeans must assume greater responsibility"

on EU defence investment gaps analysis and the work in Brussels on the EDIRPA regulation creating a short-term instrument for joint procurement of defence material with the support of EU funding top the list. The EU focuses on different aspects of capability development compared to the NATO Defence Planning Process, where less emphasis is given to the way that individual allies develop the required capabilities. "For NATO, the biggest concern is to create a meaningful overall force package," says the Deputy Minister. "Here I also see the opportunity to strengthen the capacity of the European defence industry and thus the security of supply."

From planning to acquisition

Ultimately, discussions about favouring NATO or EU processes are beside the point, many EU officials argue. Now that defence spending in Europe is rising fast, taxpayer

money must not be wasted. Deputy Minister Jireš' view is no different, saying the EU defence review process of CARD must be used in an efficient way to avoid unnecessary duplications. "In this sense, there is plenty to do regarding our national processes," he says. "We need to accelerate the transition from capability planning to capability acquisition."

For now, though, buying off-the-shelf from countries outside the EU is inevitable, given the limited capacities of Europe's defence industry and the need to replenish stocks emptied due to massive weapons deliveries to Ukraine. Off-the-shelf procurement has a number of advantages and it is not limited to the United States. "The Czech Republic as well as other European states need to buy equipment rapidly and on a large scale," adds Jireš. "Europe does not currently have sufficient production capacities, so it is advisable to look also for other solutions from our allies and partners, including, of course, the United States," he says. That approach would seem fitting for a country that highly values Europe's alliance with North America and believes Europeans must be strong and reliable allies. [K](#)

"THE WAR IN UKRAINE HAS IGNITED A SHIFT IN THE EU"

Hanno Pevkur, Minister of Defence of Estonia, took up his post in July 2022. In the following opinion piece, he reflects on the impact of the war in Ukraine, the need for joint procurement and why EU governments must reach the 2% level in defence spending.



The war in Ukraine is not only Ukraine's war – they are fighting for a rules-based world order and, essentially, for all those states who abide by the same values. That is why we all support Ukraine as much as we can, and we will continue to do so as long as is needed. Of course, in Estonia, we also have our own historical reasons. We were occupied by our eastern neighbour for 51 years; we know what life is like under Russian occupation. That is why we cannot let Russia gain anything from this war.

Since Russia's illegal invasion of Ukraine, Estonia has committed approximately €255 million in military assistance to Ukraine, which is also counted as part of the European Union's contributions through the European Peace Facility (EPF). This amounts to one third of our defence budget. It includes both lethal and non-lethal equipment, but also two field hospitals donated in cooperation with Germany. Including humanitarian assistance, all aid from Estonia amounts to €263 million, or 0.7% of GDP.

The Russian aggression against Ukraine was a wake-up call for Europe and highlighted the critical defence capability gaps. The acute threat of Russia is imminent, and Member States have started to think more about strengthening their capabilities. Member States have started to invest and spend more. It is important that this continues in the long-term. Whether, and when, we will reach the same level of production capacity and diversity of defence products that the United States today owns and offers, is another question.

'Best bang for your buck'

The most important aspect for now is that all Member States continue to direct more funding into their national defence, reaching at least 2% of GDP. This in general does not matter if it's done within the EU framework or at the individual level. Yes, we must move towards more defence development cooperation at the EU level. But first Member States need to do their homework in defence spending.

As a small nation and on the EU's eastern border, we cannot always invest money and time into longer term research and



development (R&D) projects and expect to have deliveries of equipment, custom-made purely for us. So, from the Estonian perspective, if the equipment complies with our military requirements, then the fact that it is of U.S. or EU origin doesn't have much impact.

Particularly over the past few years, our motto has been to receive the "best bang for your buck" – we always look to see how we can get the best defence from each euro spent. If market research, dialogue with the industry and later procurement shows that we should buy off-the-shelf, then that is the approach that we're willing to take.

Still, the war in Ukraine has ignited a shift in the EU. We have never seen joint decisions – such as economic sanctions on Russia – taken in such a rapid manner. Member States have come together to jointly identify capability gaps and develop solutions. All this in order to enhance our common European security space while considering the lessons identified in the war in Ukraine. I believe this has given Member States even more drive to establish EU projects channelled in the critical capability areas.

European Defence Agency (EDA) support

When it comes to military aid, Member States have given away a significant amount of their stocks as help to Ukraine. One main opportunity in the short-term is ammunition. To ensure the sustainable aid as long as necessary – until Ukraine has won this war – and maintain defence capabilities, it is critical now to deal with replenishing these stocks.

The new initiatives proposed by the European Commission to boost joint procurements, such as the European Defence Industry Reinforcement through common Procurement Act (EDIRPA) and the European Defence Investment Programme (EDIP) regulation, can have a credible effect to support this. We would like to see rapid progress.

EU-level collaborative formats such as the Permanent Structured Cooperation (PESCO) and the European Defence Fund (EDF) are working very well. In Estonia, for example, our own budget does not allow for such extensive investments into R&D. It is heartening to see that Estonian defence companies have been very successful and have secured €30 million through the EDF in the areas of robotics, cyber security technologies, data protection, surveillance, radar development, digitalisation, artificial intelligence applications, and virtual medicine training solutions.

Yet we must be honest and accept that multinational collaboration can be very challenging and takes time. I believe participation in joint projects must also always directly contribute to national capability plans. The more there are different Member States, the more layers of alignment there are: budget cycles, timelines, requirements, standards and expectations, which is a precondition to initiate joint development projects or procurements.

So, when starting collaborative projects, the first step is the agreement of Member States to make it work. EDA and PESCO can help to support us. [K](#)

Industry view: Rheinmetall HOW GERMANY IS LEARNING TO OVERCOME NEGLECT TO PROJECT STRENGTH AND RESOLVE



European defence companies have been working this year with a renewed sense of urgency following Russia's invasion of Ukraine. Overlooked for years as European governments shrunk defence spending, companies now hope to benefit from new money promised by Member States as they look to help Kyiv confront Moscow's aggression, as well as bolstering defences at home. As Germany sheds its aversion to military action, *European Defence Matters* speaks to Rheinmetall's Chief Executive Armin Papperger on being back in focus, how its new Panther tank can be a bridge to the Franco-German Main Ground Combat System (MGCS), and how the European Defence Agency (EDA) and the European Commission can help shape future security capabilities.



© Rheinmetall

Before the war in Ukraine, Germany's defence industry was unloved, but now Chancellor Olaf Scholz's decision to inject €100 billion into the country's armed forces has put it in the spotlight. What has changed for you?

Rheinmetall is now a lot more in the public eye than it used to be. There's also a broad consensus in Germany among politicians and society at large that security, freedom and democracy can't rely solely on dialogue and economic cooperation. You need to be

able to project strength and resolve. This is something we've forgotten in Germany in recent decades, and it has caused us to neglect our security posture – especially our military security. I'm very glad that our chancellor has decided to make national security a centrepiece of government policy again. Security through military strength is now endorsed by 62% of German society from 38% in 1989. German public opinion, all in all, has changed during the war in Ukraine in 2022 in relation to security.

Where are the shortfalls in German defence?

There are a lot of gaps at the Bundeswehr that need to be plugged: capabilities, structure, equipment, you name it. At Rheinmetall, the new era isn't just limited to Germany. Lately, we've seen an enormous increase in demand from neighbouring countries and other partner nations. The strategy of internationalisation that we've been pursuing in recent years is paying off now, because we're already present →

"You need to be able to project strength and resolve. This is something we've forgotten in Germany in recent decades, and it has caused us to neglect our security posture – especially our military security"



in a lot of these countries with projects and production facilities. That's a big help.

How intense is the pressure for new artillery and vehicles? What sort of lead times are you facing?

In Europe, the increase in demand focuses on just a handful of manufacturers. The availability of material poses a growing challenge here: for example, when we order steel for tank guns today, it can take eight to 12 months to arrive. Tanks also need engines, tracks and electronics. All these things have long delivery times – I mean, sometimes there's a 24-month wait for electronic components. Obviously, we do everything we can to speed up the process by stockpiling materials, for instance, and by placing orders with our suppliers as early as possible.

More broadly, now that EU defence spending is rising again, there is a concern that taxpayer money will be wasted in duplication. From your point of view, what

are the obstacles to more EU defence collaboration?

This concern is entirely unfounded. On the contrary, the increasing Europeanisation of important areas of defence policy is already resulting in significantly greater cost efficiency. For example, in the context of the European Defence Fund, Europe's defence industry is becoming more and more competitive and innovative through targeted cooperation. At the same time, the specific military capabilities the EU needs are also becoming clear.

Can you give an example?

Of course. Take the German defence minister's declaration of intent to jointly procure 35% of future armaments at European level. What's more, the European Commission has proposed a legal instrument to strengthen joint procurement through the European Defence Industry Reinforcement through Common Procurement Act, or EDIRPA, for 2022-2024. Going forward, the volume of these

programmes will increase significantly. We don't expect to see a reversal of this trend. In fact, the opposite is true. Thanks to the European Union, duplications – with each Member State developing its own armament systems and each Member State separately procuring common requirements – can be avoided. In a further step, common arms export guidelines could be introduced in future. This will have a positive economic impact, too, which will benefit the taxpayer.

EDA has identified the key capability gaps that make European forces unable to sustain operations without U.S. help. Do you think Europe can really fill all these gaps?

Potentially, for sure. Of course, this process is only just getting off the ground, and it will take time to fully close these capability gaps. After all, we're talking about a large number of Member States that will have to coordinate and agree to this. But there's absolutely no doubt that



The Marder infantry fighting vehicle: first produced in 1971, it has remained in service to the present day, from Cold War-era exercises to Afghanistan.

it's technologically feasible and politically desirable. The European institutions, especially the Directorate-General for Defence Industry and Space and the EDA, will take the lead here in future and create the necessary structures and policies. The rise in global conflicts, in particular the war in Ukraine, is driving this acceleration.

Rheinmetall's new main battle tank was unveiled in June. Why is this "a new tank for a new era"?

The Panther has got everything it needs today: a more powerful main gun for maximum combat effectiveness, superb mobility, a digital command and control capability, and the best-possible force protection features. In the war in Ukraine, we've seen how Russian tanks like the T72 are practically defenceless against modern antitank missiles. Tanks today need active protection systems of the kind developed by Rheinmetall. The Panther also features protection against drones and guided missiles that attack from above, our 'Top Attack Protection System'. Another very important point: the Panther

is available at short notice, not sometime in the next decade. The Panther has earned us an enormous amount of attention and recognition, by no means limited to professional defence circles.

This tank will compete directly with the Franco-German project Main Ground Combat System (MGCS). Is this not the kind of duplication that the EU wants to avoid?

No. The Panther is our current response to current requirements. Looking at the security situation in Europe today, I'm very glad we decided to develop it a while back. Existing tank concepts are mostly 40 years old. Many countries are thinking about renewing their legacy systems, which is more urgent than ever now. The Panther incorporates Rheinmetall's full range of expertise in weapons, ammunition, force protection, sensors and digitisation. We see the Panther as a bridge to the MGCS, which incidentally won't be available until the middle of the next decade at the earliest. Moreover, it offers an alternative to countries that don't want to participate in

the MGCS programme. Of course, the MGCS will also benefit from our technologies and experience.

Lastly, Rheinmetall was reported as saying in September that 16 Marder infantry fighting vehicles it had restored at its own cost were ready to be delivered to Ukraine if officials in Berlin gave the go-ahead. Can you give us an update?

It's up to the German government to decide which military systems to send to help Ukraine defend itself, whether from surplus Bundeswehr stocks or the defence industry. A considerable amount of material has already been supplied, including artillery and air defence systems, vehicles, ammo, protective kits, and all sorts of other things.

To help Ukraine, the German government has agreed to an equipment swap with Greece, which will be getting our Marders in exchange for sending BMP-1 vehicles from its inventory to Ukraine. We shipped the first Marders in October. Negotiations on further deliveries are ongoing. [K](#)

Critical view

"CREATING A SINGLE MARKET FOR DEFENCE - IT'S THE CHALLENGE OF A CENTURY"



Paul Taylor, a defence specialist at the Friends of Europe think-tank in Brussels and former Reuters European affairs editor, sits down with *European Defence Matters* to discuss the state of European defence investment and what he calls "the challenge of a century" – creating a European single market for defence. A long-time watcher of European integration from Paris, Berlin and Brussels, Taylor has witnessed what he says are the many missed opportunities in search of a more self-reliant European defence. Now that the EU has been shaken out of its post-Cold War complacency by a resurgent, aggressive Russia, it is still an open question whether this time will be different, he says.

"Do [European leaders] want a European Defence Industrial Base or are they happy to outsource most of their needs to the United States?"

You were at a conference with High Representative Josep Borrell in Spain in September when he compared European militaries to Japanese miniature plants, or bonsai trees, because they have been pruned back so much. He also warned that if each EU state just increases its military capabilities in isolation now in response to Russia's invasion of Ukraine, Europe will "just have 27 bigger bonsais." Is he right?

More money is being put on the table. But the fact is that it's not yet being overwhelmingly spent on European efforts. It's being spent to a significant extent on off-the-shelf American kit and/or channelled towards national armament directors and industries. And the degree of coordination is – for me as

somebody who believes in that – distressingly low. Figures produced by the European Defence Agency (EDA) show that the amount of R&D money going into collaborative projects has actually gone down in the last decade. We need to spend this money rationally, but we need political leadership from the Member States to turn collaboration into reality.

Are you saying that much of the possibly €200 billion expected in additional defence spending risks being wasted without more collaboration?

Take Germany's €100 billion special defence fund as an example. There is no specific earmark for any EU collaborative project,



Launched by Germany and France in 2017 and later joined by Spain, the Future Combat Air System project is Europe's biggest defence programme.

although they do mention the possibility of European projects. The first monies to be allocated are for the Lockheed Martin F-35 fighter jets from the United States, because Germany needs to replace aircraft to deliver its share of nuclear ordnance, and the order of Boeing's P-8 maritime patrol planes. In both cases, these cut across European collaborative programmes. Where does that leave the Future Combat Air System (FCAS) being developed by France, Germany and Spain, or the Permanent Structured Cooperation (PESCO) project for a maritime surveillance aircraft? And in other Member States, big defence companies seem to prefer to go it alone nationally or work with the United States. I'm struggling to see how Europe is going to spend this bonanza in a rational, coordinated, and collaborative way.

EDA identified key capability gaps and is working with willing Member States to foster collaboration. What, for you, is the basic issue holding the EU back?

The fundamental question that European leaders need to ask themselves at a strategic level, given what's happened in Ukraine, is: Do they want a European Defence Industrial Base, or are they happy to outsource most of their needs to the United States? Despite all the talk of strategic autonomy and all the new money

being promised, there's actually very little progress visible on big collaborative projects. Unless EU countries do more to coordinate their equipment purchases, harmonise military requirements and procurement timetables, and make their rival defence industries collaborate, EU countries will waste an awful lot of money.

There has been huge progress in Europe on European defence since 2017, through PESCO, the Coordinated Annual Review on Defence (CARD) and the setting up of the European Defence Fund, not to mention the work of EDA. Would you not agree that progress is being made on smaller collaborative projects?

I don't want to be too gloomy. Perhaps we look too much at the big projects. Small is beautiful, small is also realistic. Through PESCO, the Cyber Rapid Response Force has gone live. There's the Medical Command. There's been some progress on the European Secure Software Defined Radio. EDA has done work on the capability gaps and there is work on joint procurement of arms and ammunition. So, we certainly could have a rational discussion about whether CARD can discipline everyone. There is still low-hanging fruit to be picked on having more European training, maintenance of

equipment and standardisation. It also depends on how you define European defence. Everybody has run to NATO because of the war in Ukraine. But they run to the EU for other things, for sanctions, to manage energy supplies and to coordinate the purchase and provision of defence equipment to Ukraine, which is actually fighting a war on our behalf, through the European Peace Facility (see EDM page 20). A quick win would be to agree on common procurement and production of NATO-standard munitions of which we are all woefully lacking, particularly after giving some away to Ukraine."

Is it an understatement, then, to say that defence collaboration remains a challenge?

The trouble with defence is that it is a bit of an exception to the kind of cross-border capitalism that the European Union has been so good at promoting, because you tend to have monopoly or duopoly suppliers to a monopoly customer. And therefore, other factors matter more in defence than other capitalist industries. We are not seeing any real consolidation of the defence industries, and certainly not cross-border mergers. Creating a single market for defence – it's the challenge of a century. [K](#)

NOT JUST A 'SOFT POWER': TABOO-BUSTING INSTRUMENT HAS STRENGTHENED EU UNITY

Rory Domm is Head of Division responsible for the European Peace Facility (EPF), which has helped finance and deliver equipment for military purposes to partners worldwide in support of EU foreign policy, notably to Ukraine, Africa and the Western Balkans. Out of his Brussels office at the European External Action Service (EEAS), Domm was part of a group of key stakeholders that helped set up the EPF prior to its launch in mid-2021. He has since been at the centre of efforts to shape the EPF, together with Member States and colleagues in the Council of the EU and European Commission, particularly for Ukraine. He speaks to *European Defence Matters* about why the EPF is an expression of EU unity, its future and how its position in defence industrial policy should not be overlooked.

The economically powerful European Union has long been able to boast of a 'soft power'. But with Russia's invasion of Ukraine, the EU was also quickly able to find funds for arms, and just days after the start of the war. A taboo had been broken, High Representative Josep Borrell said in late February as EU foreign ministers agreed to provide €500 million for Member States to support Ukraine's military.

Out of the limelight, Rory Domm and a small group of dedicated EU officials had to make that happen. "The EPF was mobilised very quickly and we worked around the clock. The invasion started on the 24th (of February) and on the 28th, we had the EU Council agreeing that first tranche of support," Domm says.





"It's about credibility, and matching resources to the level of political ambition"

The precise wording of the EU treaties prohibits the European Union from using its seven-year budget to fund military or defence operations, but it was long felt that EU foreign policy needed a tool to support partners on military and defence issues. Two years before Russia's invasion, Domm had been negotiating the establishment of the off-budget EPF. "This was a missing tool in the EU's toolbox. Perhaps the most illustrative example is when we were able to provide training to third country partners, but we weren't able to supplement the training with the necessary equipment."

The EPF's goal was broadly defined: to deliver military aid to partner countries and finance the deployment of EU military

missions abroad. "The EPF has a global mandate," Domm says.

Expression of unity

The EPF plays a role in a number of key geographical areas, notably Africa where €600 million has been allocated to finance African Union Peace Support Operations between 2022 and 2024, and Mozambique, with an EU Training Mission working with partner military forces using equipment financed by the EPF.

However, it is in Ukraine where its contribution is being felt most. With its ceiling set at €5.69 billion for the period 2021-2027, the EPF – following approval by Member States – has already set aside €3 billion for Ukraine, and in less than a year.

The impact of such a level of EU support is multifaceted, Domm says. "It's an expression of EU unity in response to Russia's full-scale and illegal invasion of Ukraine. It's also a sign of solidarity between Member States," he asserts. It is, of course, a way to give concrete support to Ukraine militarily. "But it does that by incentivising the Member States to provide more support than they might otherwise have done."

Would Baltic countries still have given a third of their defence budget to Ukraine if the EPF had not existed? Domm, an EU diplomat whose previous posting included Washington and North Macedonia, believes it gives countries the reassurance that they can restock the equipment they have supplied to Ukraine. "That's the case we →

SPOTLIGHT: THE EUROPEAN PEACE FACILITY

made. And we also had positive feedback from Member States that this is an instrument that's worth supporting."

So how does it work in practice? Essentially, Member States hand in their receipts on a periodic basis to the EU Military Staff. "The main criterion for support are the needs of the Ukrainian Armed Forces," he says. The levels of reimbursements are calculated by consensus. "The reimbursements made are very sizeable, up to €3 billion. So that's a sizeable contribution to the efforts the Member States have made." Reimbursements for support provided have already begun.

Future funding?


With such a large chunk of the EPF financing already pledged to Ukraine, and the EPF's high-profile successes, it inevitably leads to questions about whether the Facility's budget should be increased. Domm says that is a discussion for Member States, but he believes it is one that has its merits. "It's about credibility, and matching resources to the level of political ambition."

He also says any future financing needs to consider how so much has changed in supporting Ukraine in such a short time. "In the beginning, this was about the reimbursement of stocks, because it was about taking stocks off the shelf to support Ukraine's right to self-defence," Domm says. "Now we see that the conflict

is potentially going to be drawn out, and that the defence industrial base needs to be mobilised. And so, we have tried, through the EPF, to enhance the possibilities to allow for Member States to deliver equipment through procurement."

The same is true of maintenance and repair, he says, so that if an EU country gives equipment to Ukraine that later requires maintenance, then the costs of that might also be eligible for reimbursement. That could mean that for Ukraine it is also less burdensome to take on so many different types of Western equipment and at short notice. "The support to Ukraine under the EPF is evolving," he asserts.

Even as the EPF is set to move further into procurement support, Domm is eager to underline that the Facility's goal is to support the EU's external policy of the EU as part of the EU's integrated approach to external conflict and crisis, the Common Foreign and Security Policy (CFSP), and in line with the EU's strong commitments to international humanitarian law and international human rights law.

"It should be a complimentary debate about the additional support that can be given to the defence industrial base," he adds. Even if the Facility is a CFSP instrument, "we should be alive to the read-across to defence industrial policy. In due course, there can be positive spillover effects." 

EPF at a glance

- › The EPF is an off-budget instrument to help prevent conflicts, build peace and strengthen international security. It helps the financing of the Common Foreign and Security Policy (CFSP) where it has military or defence implications.
- › The EPF has a financial ceiling of €5.692 billion for 2021-2027. Contributions are determined on a Gross National Income (GNI) distribution key.
- › The EPF comprises two financing pillars in a single instrument: an Operations Pillar, financing the common costs of Common Security and Defence Policy (CSDP) military missions and operations, and an Assistance Measures Pillar for third states, regional or international organisations.
- › Since the full-scale Russian invasion of Ukraine on 24 February 2022, the EPF has been reimbursing Member States' deliveries of both lethal and non-lethal equipment to Kyiv. Reimbursement levels are decided by consensus among Member States.



High Representative Borrell and Mozambican Minister of Defence



Needs assessment mission, Bosnia and Herzegovina, October



© Simone Schuller

nce Cristovao Chume at a handover of EPF-financed equipment to the Mozambican armed forces, September 2022.



© EUFOR Althea

2021.



© Armed Forces of Ukraine

Needs assessment mission, Ukraine, October 2021.

"WE HAVE A CLEAR IDEA ABOUT THE FUTURE OF UKRAINE"

Vsevolod Chentsov, Head of the Mission of Ukraine to the European Union and the European Atomic Energy Community, was appointed Kyiv's top diplomat in Brussels in August 2021. On call around the clock since Russia launched its full-scale invasion against Ukraine on 24 February, he has been at the centre of political and defence cooperation with the EU. He sits down with *European Defence Matters* to discuss European military and economic support for Ukraine, future EU membership, Ukraine's Administrative Agreement with the European Defence Agency (EDA), and how the war with Russia might end.

Ukraine's ambassador to the EU, Vsevolod Chentsov, laughs gently when asked if he gets much sleep. Ukraine's diplomatic mission in Brussels has become a 24-hour, seven-days-a-week operation since Moscow launched its full-scale war of aggression. "I'm not complaining. In Ukraine it is clearly more difficult than here," he says on a day after more Russian cruise missiles struck critical infrastructure across the country. More than 14 million Ukrainians have been forced to flee their homes since the war started, according to the United Nations. "In Belgium we are not under daily bombardment, so we have a responsibility to do whatever we can."

That also means doing things much faster than before, pushing at all doors and working as closely as possible with the EU and international organisations to keep communication flowing with European allies. "We can deliver any message we have to on time, and provide a response back to Kyiv," Ambassador Chentsov says. "We are doing our best to get our message through."

Despite international condemnation of Russia's war and the outpouring of support for Ukraine – flowers are regularly left outside the mission's building in Brussels – nothing can be taken for granted. "It's very important to maintain that good level of

cooperation and that people understand what the Russians are really doing in Ukraine," he says, recalling several visits he has undertaken with European politicians and officials to Kyiv. "Winter is coming, and Russia has begun this new phase of targeted bombardment of Ukrainian cities, of our electricity infrastructure."

Still, Member States' decision in June to grant official EU candidate status to Ukraine has been a big morale boost, asserts Ambassador Chentsov, a former envoy to the Netherlands and who also held senior diplomatic posts in Turkey and Poland. "EU membership is a uniting element for our political class, for the government, for the whole society," he says. "We are fighting to defend our country but there is also a clear idea about the future of Ukraine after this war."

Closer military cooperation between the EU and Ukraine is already bringing Kyiv closer. While Ukraine must enact judicial, economic and other reforms to be able to proceed to negotiations towards full EU membership, training is underway by Member States and is set to accelerate under a new EU programme agreed by EU foreign ministers in October. The EU Military Assistance Mission for Ukraine (EUMAM

› "Any war ends with a settlement. But that settlement is not Ukraine's surrender. The best solution is for Russian forces to withdraw from Ukraine, the Russian leadership to face justice and for Moscow to pay damages"



© Mission of Ukraine to the European Union

Ukraine) aims to train large numbers of Ukrainian armed forces personnel in a variety of military functions such as basic individual, collective and specialist training, going beyond the current approach that focuses on allowing Ukrainian soldiers to use specific weapon systems.

Ambassador Chentsov believes the EU and Ukraine can go much further. Training could include a kind of cross-fertilisation, in which Ukrainian forces can share their war experience with European troops, an idea that the ambassador has already suggested. There are also discussions about trying to respond as closely as possible to Ukraine's needs, be it in basic military training, collective training of battalion-level units and training of a brigade HQ, medical personnel, combat engineers, Chemical, Biological, Radiological, Nuclear (CBRN), communication and cyber security training, or other, classified, areas. More European weapons could be tested in Ukraine, or Ukrainian designs and adaptations considered for future weapons' production. "When we win this war, there will be many more areas of defence cooperation with the EU," Ambassador Chentsov says. That hints at the realities of the present. While EDA and Ukraine cooperate through the Administrative Agreement in areas such as

standardisation and European air transport, the urgency is on overcoming Russian forces.

Ambassador Chentsov praises the work of the European Peace Facility (*see EDM page 20*) and the €3.1 billion of Member States' contributions so far. There is also the €9 billion of Macro Financial Assistance (MFA) that the EU is providing to Ukraine this year. Ukraine hopes all this amount will be disbursed this year and that the EU can provide €18 billion in MFA funding in 2023, not including humanitarian aid or direct budget support, to keep Ukraine's economy afloat and maintain its defence industrial base.

But he feels there is a need to fine-tune further support under the EPF, with a focus on accelerating reimbursements so that Member States can keep arms and ammunition flowing to Ukraine. "During the first months of the war, EU Member States were sending what they had in their depots, mostly Soviet-type equipment. But now they have depleted their stocks and they have to produce in order to continue supplying Ukraine. So, if we are talking about the EPF, it is a fund that needs to be filled with actual money, rather than commitments to pay," Ambassador

Chentsov says. "Nobody expected this situation, but there is a need to adjust this instrument."

Just as few expected a full-blown war in Europe, talk of how the conflict might end seems premature as heavy fighting continues in the eastern regions of Luhansk and Donetsk and Russia targets Ukrainian infrastructure. But Ambassador Chentsov is clear: "Any war ends with a settlement. But that settlement is not Ukraine's surrender." For Kyiv, its territorial integrity refers to its 1991 borders, including the peninsula of Crimea that Russia seized in 2014. The best solution, he says, is for Russian forces to withdraw from Ukraine, the Russian leadership to face justice and for Moscow to pay damages.

The broader problem, he states, is that there can be no negotiations with Russian President Vladimir Putin or someone in his mould. "If the nature of the regime does not change, Russia cannot change. It cannot be a prosperous, democratic country. It can only remain a threat to the world," he says.

And with those thoughts, the ambassador's mobile phone lights up, ringing beside him, and he is called back to his office, as his 24/7 diplomatic operation continues. **K**

MILESTONES: EU DEFENCE TIMELINE



1948

Treaty of Brussels provides defence clause for France, UK & Benelux



1949

NATO founded

1954

French parliament rejects European Defence Community

Treaty of Brussels expanded to create the WEU

1963

Elysée Treaty between France and Germany for armament cooperation

1992

Petersberg Tasks: WEU to make military units available to NATO, Europe



1998

St Malo Declaration: France and UK agree to give EU a defence capacity

"This is the hour of Europe, not the hour of the Americans."

- former Luxembourg Foreign Minister Jacques Poos, 1991, speaking on the eve of the Balkan wars

"For decades we had been confronted by various forms of crises on our doorstep - but without the means to address them."

- former High Representative Javier Solana, 2006

"It is the most basic and universal of rights to feel safe and secure in your own home. Europeans rightly expect their Union to provide that for them."

- former European Commission President Jean-Claude Juncker, 2017





2001 2004 2016 2017 2020 2021 2022

OCCAR legal status

Belgium, France, Germany, Italy, Spain and UK for industry collaboration

European Defence Agency created

to deepen EU defence cooperation

EU Global Strategy lays

ground for PESCO, CARD and EDF

PESCO established

First EU defence review

through CARD

European Defence Fund starts

with €8 billion budget

EU Strategic Compass charts

pathway for EU rapid response force

"To cope with upheavals worldwide, we need a sovereignty that is greater than our own, but which complements it: a European sovereignty."

- French President Emmanuel Macron, 2018

"Our borders are becoming increasingly unstable ... In the east, we are facing aggressive Russian policy, which is capable of going to war in order to block neighbouring countries from choosing the European path."

- Polish Prime Minister Mateusz Morawiecki, 2021

"For Europe, we have a choice to make. Either we seriously invest in our collective capacity to act. Or we accept being an object and not a subject in foreign policy."

- HR/VP and Head of EDA Josep Borrell, 2022



HOW DEEPER COLLABORATION COULD EMERGE FROM THE EU'S DEFENCE REVIEW

Imagine the year is 2042. The European Patrol Corvette sails on EU waters and the Eurodrone is flying in its skies. EU Member States have spent the past two decades closing capability gaps and now boast technologically advanced armed forces able to deploy quickly. EU governments have rallied around a single Main Battle Tank, while the cost of spare parts has fallen dramatically as the standardisation of weaponry and equipment becomes the norm.

Today, in late 2022, as Member States digest the findings of the second EU defence review - the Coordinated Annual Review on Defence (CARD) - such visions might seem like a utopia. Only modest progress has been made to turn the collaborative opportunities identified in the 2020 CARD report into concrete cooperation. While the European Defence Agency (EDA) has highlighted critical gaps that EU governments should work together to fill, such as air defence systems, long-distance air transport and tankers, to some it might seem like an unbridgeable gulf.

The 2022 CARD report makes clear that: "Defence planning continues to be done mostly in isolation." It also says that Member States "remain unconvinced by European cooperation projects." Only 18% of all investment in defence programmes involved cooperation. But if the latest CARD report reflects a less promising reality, it also points to the forward-looking optimism that is growing in EU capitals about the latent potency of EU defence and of CARD itself.

New projects launched

First proposed by EDA in 2017, CARD is no longer just a retrospective review of

Member States' defences but charts a path for joint capability development. EDA's higher aspirations for defence collaboration are being shared, as the message to Member States sinks in.

"Everybody now realises that if we raise our budgets but continue to spend them the way that we have, then we will not get more value for our money," Dutch Minister of Defence Kajsa Ollongren told reporters following the EDA Steering Board on 15 November, where the 2022 CARD report findings were discussed.

As EU defence spending is set to rise a further €70 billion by 2025, CARD has a central role to play by pointing the way towards projects in EDA, the Permanent Structured Cooperation (PESCO), the European Defence Fund and other frameworks.

Already, PESCO projects in unmanned aerial and maritime systems, air transport and main battle tanks have been launched, based on the CARD 2020 cycle. CARD is: "The best image of the defence landscape that we have in Europe. If you want to know about European defence capabilities, take a

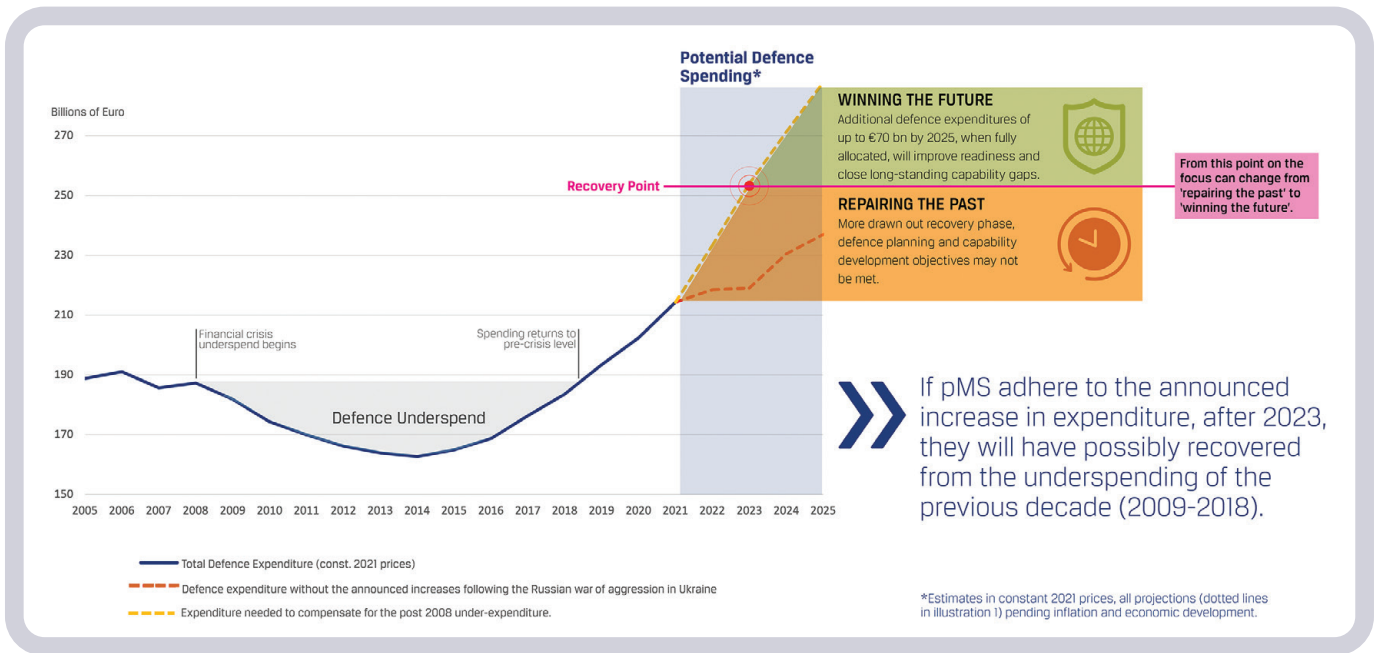
look at the CARD," said High Representative and Head of EDA Josep Borrell after the Ministerial Steering Board in November.

Four-step process

Following Russia's illegal annexation of Ukraine's Crimea peninsula in 2014, the EU Global Strategy of 2016 sought a more systematic approach to EU defence. For EDA, along with the EU Military Staff, that meant a proper scanning of the horizon through a defence review to get countries working together.

Back in 2018, when EDA completed a trial run of CARD, Member States were sceptical, worried about the administrative burden. But the Agency had a solution: to use all available data that governments already submit to the EU Military Staff and NATO to form the basis of CARD. It was voluntary.

The 2022 CARD Report recommends "optimising the sharing of all substantial information" using the EU Collaboration in Defence (EUCLID) platform. Though EUCLID has evolved considerably from the early years, it still relies mainly on the goodwill of participants to share the relevant information at a sufficient level of granularity. As former



EU defence spending: recovering and addressing future needs.

EDA Chief Executive Jorge Domecq, one of the architects of CARD, said of the emerging EU defence framework in November 2019: "The main challenge is that we now need to get Member States to realise the advantage of using these EU tools."

Three years on, and that is happening. The Swedish EU Council presidency from January will hold a seminar on the lessons learned from CARD 2022. Early supporters of CARD have been joined by all EU Member States in welcoming the review's objective and straightforward approach.

In a four-step process of EU defence cooperation, the implementation of the priorities identified in the EU's Capability Development Plan (CDP) is informally linked to CARD, which in turn acts as the pathfinder to fill the gaps through PESCO. The European Defence Fund provides the incentive to work together with its seed money for joint projects identified through CARD. At the end of the process, capabilities are owned by Member States.

This year's "A Strategic Compass for Security and Defence" strengthens that four-step process with an ambitious plan of action for strengthening cooperation, with ways to establish an EU Rapid Deployment Capacity of up to 5,000 troops, hold more regular

live military exercises, reinforce maritime security and invest in the European Defence

Technological and Industrial Base, among other goals.

Three questions to...

Ralph Briers

Head of Unit Cooperation Planning at EDA



What is CARD? Why do we need it?

CARD is the only comprehensive review of European defence that provides a full picture of the landscape over time, including in capability development, research & technology, the defence industry, and operational aspects. CARD is a tool for planning as it can show where national plans fit into the broader European context. This opens up possibilities for enhanced cooperation.

Is it efficient to conduct a CARD cycle every two years?

Two years is an optimal cycle, as it is enough time to capture changes in planning but not too far between cycles to lose momentum or keep up with new developments. CARD needs to be responsive, both to changes in Members States' plans but also to shifts in the strategic environment.

How can CARD be improved?

After each cycle, workshops are held with Member States to solicit their views on what could be improved in the process. When planning each cycle, EDA reassesses internal procedures and tries to streamline them to carry out each step more efficiently and avoid unnecessary work for Member States. By incorporating internal and external feedback, CARD is constantly evolving to become a more responsive and valuable tool for EU defence.

EUROPE SHOULD FEEL CONFIDENT ABOUT PESCO'S FUTURE, EDA SAYS



Former European Commission President Jean-Claude Juncker famously called for the European Union to wake up the "Sleeping Beauty of the Lisbon Treaty" and take advantage of the legal basis that allows Member States to launch a permanent form of European defence cooperation. In December 2017, 25 EU governments, with the exception of Malta and Denmark, set in motion the Permanent Structured Cooperation (PESCO). The European Defence Agency (EDA) is part of PESCO's secretariat.

Fast forward five years and PESCO offers a legal framework for Member States to jointly plan, develop and invest in shared capability projects, and enhance the operational readiness of armed forces.





Spending on defence is more an insurance premium than a fairy tale. But to borrow from the imagination of Jean-Claude Juncker, it was another of Europe's influential politicians who played the role of PESCO's fairy godmother: former German finance minister Wolfgang Schäuble. He and two of his colleagues argued in a 1994 paper 'Reflections on European Policy' that the EU had to be more integrated.

The origins of permanent defence cooperation lie in that paper, says Alessandro Cignoni, who headed the EDA's PESCO unit

from its inception until recently. It called for the EU to, among other things, further develop the EU's institutions, create a central core of EU states and improve the European Union's capacity for effective action in the field of foreign and security policy. "It was thought in the 1990s that a core set of EU Member States with the ability and capability to do more would be ready to commit to closer defence cooperation," Cignoni says.

Russia's illegal annexation of Ukraine's Crimea peninsula in 2014 was another warning for EU leaders who had allowed their militaries to

become degraded after the end of the Cold War. France and Germany saw proposals for structured cooperation as a way forward. In addition, the EU Global Strategy document in 2016 raised the European Union's ambition to become a security provider. The initiative was taken up by the 25 EU Member States, who said they would take part in permanent structured cooperation and called for the formal establishment of PESCO.

Ties that bind

A core Europe has never been embraced, and the jury is still out on whether Member →



SPECIAL FEATURE: PESCO FIVE YEARS ON



EU leaders launch the Permanent Structured Cooperation, during an EU summit in Brussels, 14 December 2017.



Alessandro Cignoni, Head of EDA's PESCO unit until recently

"I think a lot of lessons out of this activity can be shared"

States' later push for what many termed 'inclusivity' made PESCO stronger or has held it back. "The idea was not to leave anyone behind," Cignoni says. He says that the idea of a group of countries doing more in defence projects still holds. "Collaboration in defence has always been difficult. And as a matter of fact, we live in a Europe that is too fragmented in terms of defence capabilities. So Schäuble addressed the issue of creating cooperation in a permanent, more binding way."

For Krista Salo, who has taken over as head of EDA's PESCO unit, the ambitious and "more binding" commitments undertaken by participating Member States are what makes the cooperation so important. "PESCO is a very relevant step forward in developing the EU defence dimension because the gist of it is in the binding commitments," she says. Those 20 more binding commitments include, for example, increasing defence budgets in real terms, increasing defence investment expenditure to 20% of total defence spending, and increasing joint and collaborative strategic defence capabilities projects.

The important thing to remember, Cignoni and Salo both say, is that no one is trying to replace NATO. PESCO's founding acts also specify that the transatlantic alliance "will continue to be the cornerstone of collective defence for its members". Reiterating what many other senior figures in Europe believe, PESCO is a way to have a stronger European pillar in NATO.

That strength is being built every day, Cignoni and Salo say. Firstly, the fact that Member States are starting to look beyond their national viewpoints is a big culture

shift. "The Member States have also made a commitment to consider as a priority a European collaborative approach to fill capability shortcomings identified at the national level," Salo says.

Then you have the individual projects themselves which are taking shape, from the Strategic Air Transport for Outsized Cargo to the European Patrol Corvette, which could be sailing from 2028. There are the Cyber Rapid Response Teams and the European Medical Command, which are up and running.

There is also involvement in PESCO by non-EU countries. Canada and the United States, as well as Norway, are participating in the PESCO project of Military Mobility. On 14 November, Britain's request to join Military Mobility was accepted.

Even with 60 projects underway, today's PESCO is still in its formal initial phase, which runs until 2025.

That should probably be kept in mind before judging PESCO too harshly. Yes, too many projects may have been undertaken, and some will have to be terminated. Yes,



Development, Delivery and Determination

there is a need to move towards delivery of capabilities and shared assets. But PESCO will never make up for years of underinvestment in defence on its own. "I think a lot of lessons out of this activity can be shared. So, I wouldn't look at it negatively. I think it's part of a normal process," Cignoni says.

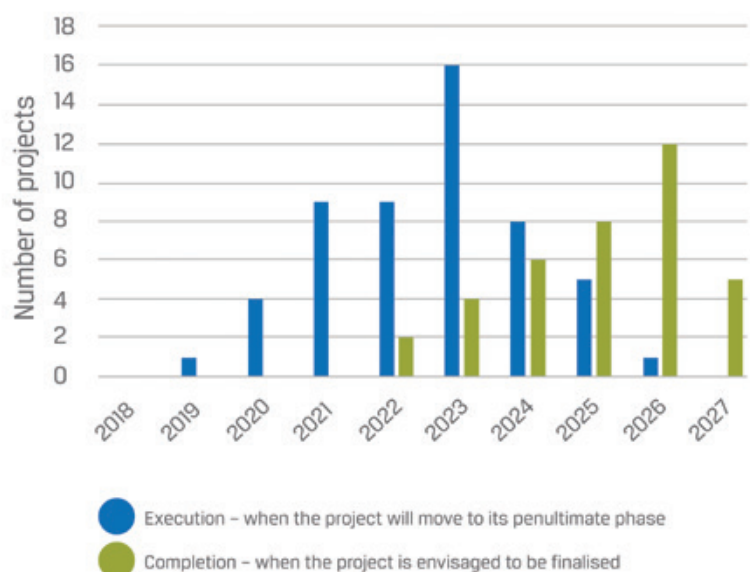
Salo adds: "What could – and I think will – be improved is to reduce the administrative burden on the Member States. There are certain procedures that are essential, but there is still room for streamlining and improving the synergies with the other defence initiatives."

What next for PESCO? Salo says the transition from planning to results will start to show, even if capability development takes time. "This is the perfect moment to set a stronger focus on output," she asserts. Cignoni suggests returning to PESCO's origins, slimming down projects and focusing on what Member States really need in the next 10 years to move from the initial phase to full implementation. "I think then that Juncker's Sleeping Beauty will fully awaken – and that will be visible to all," Cignoni says. [K](#)

Chart: PESCO projects per domain



Chart: Expected progress of projects



HOW EDA-FUNDED TECHNOLOGY IS HELPING DRONES MAKE SAFE EMERGENCY LANDINGS



In a single week in August 2017, two U.S. MQ-1 Predator drones crashed due to technological malfunctions, accident investigations showed. In one case, the loss of a satellite link caused the crash during flight, while in the other, the Remotely Piloted Aircraft (RPA) suffered an electrical failure shortly after take-off. While there were no fatalities or injuries in either case, the mishaps of the two RPA show the importance of safety.

As the use of Remotely Piloted Aircraft Systems (RPAS) grows, so does the need for the capability of conducting safe landings under emergency or contingency conditions. The European Defence Agency (EDA) has funded a project developed by two European companies, GMV Innovating Solutions and Aertec Solutions, to investigate ways to autonomously crash-land an RPA in emergency situations, where the command-and-control data link is lost, avoiding the – hard to bear – risk of the RPA falling on urban or populated areas

The Safe Autonomous Flight Termination (SAFETERM) system seeks to allow Medium Altitude Long Endurance (MALE) drones and large tactical RPAs to harness Artificial Intelligence (AI) to develop this capability. Specifically, the EDA project, which was completed and demonstrated in June 2022, aims to help further develop the technology for automatic recognition and autonomous decision-making of safe areas to land or crash-land. Standardisation and certification of such technology will be central to its wider use.

"Let's imagine you take off from Ostend and fly into the sea. The risk of having an emergency landing and hitting something on the ground is very much reduced," says João Caetano, a former remote pilot at the Portuguese Air Force and now EDA Project Officer Unmanned Aerial Systems (UAS) Programmes. "But if you take off and fly into densely-populated Belgium, the risk of hitting a structure or someone on the ground in the case of a catastrophic failure is significant," he adds.

Currently, safe flight terminations are based on pre-programmed procedures, so that if the link with command and control is lost, the drone can automatically follow a contingency flight plan and proceed to a designated landing area.

Unsafe landing

But what if the UAV has an additional failure, in which the ability to reach the designated destination is impaired? EDA's SAFETERM project developed a hardware and software suite that can identify features on the ground, using the onboard sensors, such as visible and infrared camera sensors. SAFETERM's machine-learning algorithms can assess the data collected by the sensors, detect and classify the ground area around the Unmanned Aerial Vehicle (UAV) and assess the most suitable areas for an automatic controlled crash-landing. "It's basically pattern recognition, and so colour-coded areas can be safe or unsafe for landing," Caetano says. "You could have areas in blue or green that are relatively safe and areas in red or orange to be avoided, all of this done autonomously by the RPA."

For the trials, the consortium used a TARSIS 75 fixed-wing unmanned aircraft, manufactured by Aertec, with a wingspan of 5.2 metres and a maximum endurance of 12 hours, cruising at 100 km/h.

The EDA project culminated with a real in-flight demonstration of the autonomous capability, delivering a hardware and software package with a Technology Readiness Level (TRL) – a measurement system used to assess the maturity level of a particular technology – of five to six. That means it needs to be taken further in different environments to ensure that the hardware and software is fool-proof.

"For a higher TRL, you would have to further develop the system, test it, test it and when you are done with it, test it again," Caetano says.



GOING BEYOND THE CONFINES OF SEGREGATED AIRSPACE

Imagine a world where every model of television on the market required a different connector cable instead of the typical HDMI, or if airplane manufacturers did not consider standardised safety metrics. Such a place would be much harder to live in. This absurdity is avoided mainly thanks to performance and safety requirements, and standards. In the rapidly developing world of drone technology, 99.9% of these flying machines are not certified. That, in turn, means they can only fly in segregated airspace, or airspace of specified dimensions allocated for the exclusive use of a drone, without the presence of other manned or unmanned aircraft.

One of the European Defence Agency's (EDA) goals, along with the European Union Aviation Safety Agency (EASA), is to allow the full integration of large and tactical Remotely Piloted Aircraft Systems (RPAS) into general airspace. One of the steps towards that goal lies in the agreement of the performance metrics and requirements that a Remote Pilot Station (RPS) must comply with. "So, if you are a manufacturer, and you want to have a certifiable RPS, you should produce it in agreement with these commonly agreed and standardised requirements and performance metrics," says João Caetano, EDA Project Officer Unmanned Aerial Systems (UAS) Programmes.

EDA is facilitating this integration by promoting the development of guidelines for the standardisation of RPS.

This project is sponsored by EDA and developed by Airbus, GMV and ALTER TECHNOLOGY in close collaboration with non-profit European Civil Aviation Equipment standardisation body (EUROCAE).

At this moment in time, the proposal for minimum operational performance standards encompasses flight management, 'detect and avoid', the data link, alerts and automation proposals, data recording, test procedures, and integration at a command unit level.

Such standards serve as the main tools for the development of RPSs by manufacturers, which will be provided with a suite of metrics to be used for the performance and safety of future technology. That should allow for the safe operation and airspace integration of RPAS in Europe.

Experts have been encouraged to consult the Open Consultation Document. The comments provided will be reviewed and implemented whenever possible, with the goal of reaching published standards by early 2024. Given the war in Ukraine, standards and certification are seen, more than ever, as capability enablers, because these will provide the defence industry with the guidelines to produce systems in a harmonised and reliable way.

The European Defence Fund (EDF) was set up in 2021 to deepen cooperation in the defence industry across the EU and requires that projects involve at least three entities from at least three Member States or associated countries. In July this year, the EDF announced the winners in the first round of funding, involving companies from 26 Member States, as well as Norway. Projects focus on air, land, sea and cyber capabilities.

ABOUT THE EDF: The EDF's current budget of €7.95 billion runs from 2021 to 2027, of which €2.7 billion is earmarked for collaborative defence research projects. The remainder is for joint development projects. The fund is part of the EU's efforts to deepen defence cooperation on technology.

AKTYVUS Photonics

GIANTS IN MINIATURE: LITHUANIAN ENGINEERS LEAD THE DEVELOPMENT OF LASERS FOR MINI DRONES

How did Lithuania become a hive of laser activity? During Soviet occupation, when large public gatherings were rare, an authorised Physics Day organised by the faculty of Vilnius University became a noisy celebration of Lithuania's family of physicists. Crowds in the 1980s marvelled at the multi-coloured giant dinosaur that was built and maintained by physicists and paraded through the streets to become a symbol of the self-confidence of Lithuania's scientific community.



Laurynas Šatas, CEO of Aktyvus Photonics, a Lithuanian company specialising in solid-state lasers, says the history of the Physics

Day remains an inspiration for his bid to develop miniature lasers that can guide munitions from small unmanned aerial vehicles (UAVs) – even if he is too young to have taken part in the parades.

"Aktyvus is a relatively new company, but we also wanted to do something for our security, and to help make Europe strong militarily," he says. Russia's annexation of Crimea in 2014 and its invasion of Ukraine in February are a reminder of the role that the country's scientists can play, he adds. "I have a dream of strong defence companies in Lithuania," Šatas says.

That ambition made Aktyvus Photonics one of the Baltic companies to win EDF funding in the category of 'Additive Manufacturing of Lightweight Laser Target Designator' (AMLTD) to take forward what he calls his crazy idea. Lasers are typically big, bulky and expensive – not good for the defence market. Aktyvus' business so far has been,

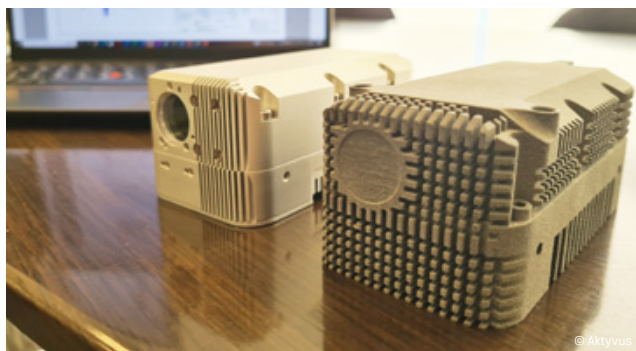
at least in part, in laser-induced breakdown spectroscopy for the mining industry, just one of the many uses for harnessing the science and technology of light in photonics.

Šatas and his colleagues set out to make the leap into defence, particularly in developing laser systems for harsh or extreme environments. Put into everyday speak, he describes their strategy as squeezing all the power of a laser into tiny boxes while overcoming the damage that would otherwise result from pushing a lot of energy into a smaller space. "As the miniaturisation trend pushes further towards smaller and smaller platforms, we design to be smaller, lighter, more power-efficient, but also with rugged electronics packaging and advanced cooling technologies," he says.

Aktyvus develops so-called Diode-Pumped Solid-State (DPSS) lasers. Unlike direct



© Aktyvus



diode lasers, which directly convert electric energy into light through a semiconductor, DPSS lasers are more complex, pumping light through crystals to gain the desired wavelength and emit a tighter beam from wavelengths ranging from the ultraviolet to the infrared.

If successful, such lasers could be used on remotely piloted aircraft to precision-guide munitions remotely. While such technology exists, for example, in the United States and Turkey, when it comes to smaller drones, targeting and range are still limited. Until

now, standardised target designation for laser-guided weapons is mainly possible with major drone platforms or ground-based systems needing highly trained personnel. Laser designation from cheaper, unmanned, backpack-portable drones could give a powerful edge on the battlefield. "You are risking less your expensive platform if designation is done from smaller and cheaper unmanned aerial vehicles," Šatas says. "You also significantly increase the precision of strikes and reduce casualties by using laser-guided ammunition in urban, or complex, conditions."

By working with others in the EDF project – Aktyvus as the AMLTD coordinator is joined by four other companies from Belgium, Greece and Lithuania – Šatas believes five years is a realistic timeframe to develop such miniature lasers and team up with UAV companies to embed his technology. "Involvement in the EDF funding has been very positive. Lithuania is a small country, so this helps us reach a pool of potential collaborators," Šatas says. "We should focus on SMEs. All innovation starts in components." [K](#)



Viewpointssystem EYE-OPENING: AUSTRIAN TECH BRINGS 'SMART GLASSES' TO THE PROFESSIONAL MARKET

For anyone with even the faintest interest in technology, Google's ill-fated attempt at developing wearable consumer tech in 2013 might ring a bell. While 'Google Glass' eyeglasses never took off for the mass market, Vienna-based technology company Viewpointssystem has had more success developing 'smart glasses' as a tool for professionals. Viewpointssystem was one of the companies to win EDF funding in the category 'Advanced Biometrics in Training and Simulation'. *European Defence Matters* sat down with CEO and owner Nils Berger to learn more.

How did it all start?

In 2016, I was given the opportunity to transition a university spin-off specialised in mobile eye-tracking studies into a company. This spin-off had developed part-functional samples of smart glasses to

conduct mobile eye-tracking studies. When these functional samples were presented to me for the first time, that was literally an eye-opener. Using the technology, you can visualise people's gaze behaviour and recognise where the wearer is looking in a particular situation. Furthermore, and this is crucial, the technology also decodes what the wearer perceives, and in what cognitive and emotional state the wearer is. At that moment, the idea of Viewpointssystem was born. There was still a lot of work ahead of us. We worked hard to bring our current smart glasses, the 'VPS 19', to market maturity, which we finally achieved in 2020.

Many people might think of Google Glass when thinking about smart glasses – and that was a flop.

We are fully focused on the enterprise space. It will be years before augmented

and mixed-reality glasses are truly mature and ready for the consumer market. Google Glass was certainly more than 10 years too early. Both the technology and the market were far from ready. And even today, there are many improvements to be made in the areas of wearability, immersion and compelling use cases – just to name a few! Nevertheless, I believe in the huge potential. I am convinced that one day, they will replace the smartphone.

Has your product caught on?

Well, today we have around 150 enterprise customers in Europe, North America and Asia, mainly in manufacturing, mobility and transport, security, and research and analysis. We have established additional subsidiaries and sales offices in Europe and North America. Our goal is to strengthen our position as the hidden



"One of the core ideas of Viewpointssystem is to enhance an interface between humans and machines in a non-invasive and safe way"

European champion for smart glasses-based remote support, training, analysis and documentation.

How do the smart glasses work?

Our system, the VPS 19, consists of lightweight eye-tracking glasses, and an external miniature computer – the 'smart unit' – for computing and transmissions, which can be worn on a belt or harness. When used for training of forces, the system connects the trainee and the remote trainer via video and audio stream. The trainee's field of view is streamed to the trainer's laptop or tablet screen. The visual focus of the trainee is also indicated on the screen, via the gaze point visualisation or a live heatmap. This allows the trainer to monitor live what the trainees are focusing on, or if they are distracted, and to give direct feedback.

The trainer can also send information, such as photos or sketches, to the smart unit. Thus, the trainee's field of vision remains unobstructed. After the training, the recorded video stream can be analysed using our evaluation software.

Why did Viewpointssystem get involved in the winning consortium for the EDF's 2021 call for Advanced Biometrics in Training and Simulation (ABITS)?

One of the core ideas of Viewpointssystem is to enhance an interface between humans and machines in a non-invasive and safe way. We would like to extend this idea by proactively monitoring the wellbeing of a person. In the ABITS project, we are focusing exactly on this. Using our smart glasses, we capture the data offered by the eyes and the gaze behaviour. Combined with biometric data

from other sensors, they provide insights into the trainee's attention, stress and cognitive load. The goal is to explore a data-driven tactical indoor training solution, and ultimately to ensure the psychological and physiological health of a person in stressful and dangerous environments.

What are some industry obstacles to more European sensor-based defence collaboration?

Technology access shouldn't be defined purely on commercial justifiability. We need to ensure that SMEs can access technologies developed and owned by large enterprises, even if their motivation is simply research and experimentation. This would increase the chances of achieving meaningful and disruptive technologies and ensure global outreach. [▶](#)



Clavister

INSIDE THE FIREWALL: PROVIDING CRITICAL DEFENCES FOR UNMANNED VEHICLES

Bursting in on a meeting at global technology company Ingram Micro might seem like a risky strategy to find customers, but it seemed to work in the late 1990s for Swedish cyber security firm Clavister, which 25 years ago relied on self-confidence and the thick print directories of Yellow Pages to find clients and financing in Stockholm. "It was the year before Google was up-and-running, still in the era of AltaVista (search engine)," says John Vestberg, Clavister's CEO, who co-founded the company in 1997. "We packed the car and went to Stockholm," said Vestberg, whose company is still based today in the Swedish city of Örnsköldsvik, located between Stockholm and the Arctic Circle.


"At the time, cyber security wasn't known on its own, and we started as a software business making internet routers that also offered consultancy," Vestberg says. "We realised that we could not compete with Cisco, but we also realised that our full software stack that worked as a router gave us the step towards developing firewall technology," he adds. Together with two other developers, Vestberg was able to create a secure and fast router, something that took larger companies, teams of staff and budget to achieve, eventually offering device and code that provide the security for an 'always-on' internet connection.

After finding early clients, including BAE Systems in Örnsköldsvik, Clavister discovered its sweet spot in firewall technology at a time when companies began to realise they had a lot to lose from an attack on their computer networks. "There is a cluster of industry groups willing to pay premium for cyber security, for instance in defence, energy and public administration," Vestberg says. "We had an earlier engagement with Saab. Defence is a growing market and a perfect fit. Soldier safety is inherently tied to, say, the protection of the computer in a military vehicle."

Nowadays, finding funding for Clavister, a Latin word meaning key holder, no longer requires interrupting meetings. Clavister was part of the winning consortium of the EDF's 2021 call for 'Unmanned ground vehicle technologies', along with General Dynamics European Land Systems, Leonardo, Indra, Sener, Iveco Defence Vehicles and 14 other European defence industry companies. The project known as Convoy Operations with Manned-unManned Systems, or COMMANDS, will be centred around the development of new technologies for unmanned ground vehicles and Clavister is set to ensure they are protected against cyberattacks. The three-

year project is expected to receive some €25 million in EU funding.

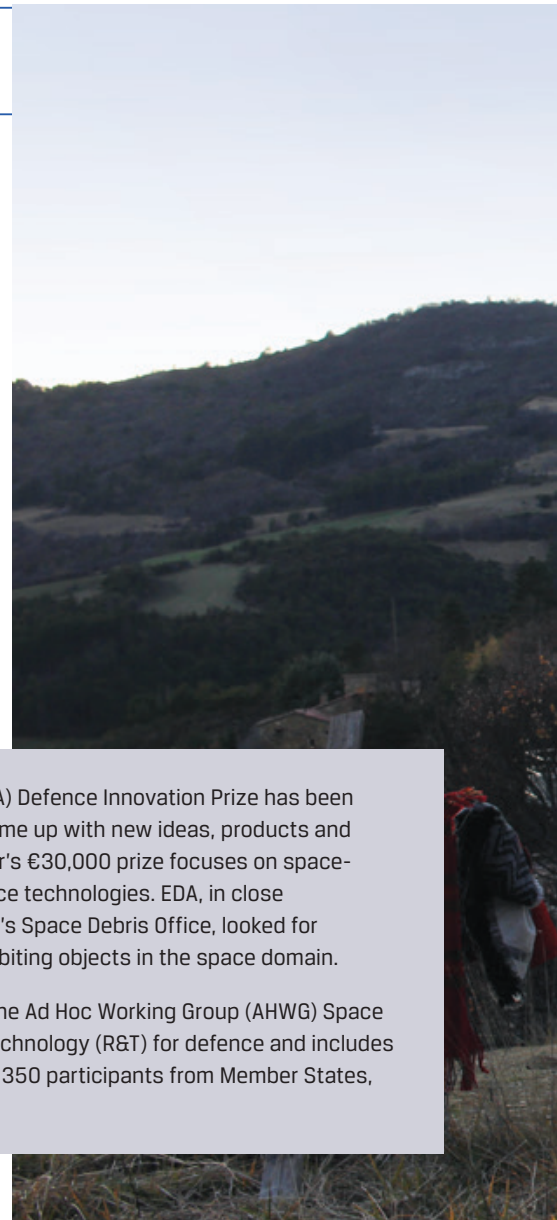
One of Clavister's latest innovations is to provide cyber security without relying on the cloud - servers that are accessed over the internet. "It's really an icebreaker when we talk to the defence industry," Vestberg says. "That's where artificial intelligence and machine learning come in handy, where it's not about seeing an attack, it's about seeing something which is unnatural, something which is an anomaly. And this is exactly what our technology can do because we can train it in what is 'normal'. We are able to do that in a live environment out in the field in just a few days, without relying on the cloud, without relying on any external components at all."

Vestberg is also upbeat about the prospects of EU defence cooperation, saying there is a greater willingness to cooperate. "In the past, if it was more about separate domains, and people who were afraid of talking and collaborating due to company secrets, or whatever," he says. The war in Ukraine is also a factor. "The geopolitical situation has caused so much demand that everyone realises that either we cooperate and have a bigger slice of a bigger cake, or we don't cooperate, and the cake goes stale." 

"The geopolitical situation has caused so much demand that everyone realises that either we cooperate and have a bigger slice of a bigger cake, or we don't cooperate, and the cake goes stale"



2022 INNOVATION PRIZE: FOCUSING ON DEBRIS AND ARTIFICIAL OBJECTS ORBITING IN SPACE



Since 2018, the European Defence Agency (EDA) Defence Innovation Prize has been rewarding companies and researchers who come up with new ideas, products and services that can be used in defence. This year's €30,000 prize focuses on space-based surveillance and reconnaissance defence technologies. EDA, in close collaboration with the European Space Agency's Space Debris Office, looked for innovation in the area of debris and artificial orbiting objects in the space domain.

The 2022's topic stems from the activities of the Ad Hoc Working Group (AHWG) Space in EDA which deals with space research and technology (R&T) for defence and includes 21 participating Member States and more than 350 participants from Member States, industry and academia.

And the winner is...

The award goes to **Share My Space**, a 'NewSpace' company founded in 2017 and part of the emerging commercial space industry. The company says it "produces, manages and enhances orbital data to generate timely, independent and secure information" for clients.

A celestial mess – How a Toulouse-based company wants to reduce collision risks in space

Human activity on earth can best be monitored from space. From warfare with satellite-guided missiles to the study of deforestation, it pays to have imaging and remote-sensing technologies in space. But outer space is getting messy, full of an ever-greater number of discarded rocket stages, defunct satellites and other bits of space junk – some created by anti-satellite military tests – that pose a collision risk for functioning satellites.

According to NASA, more than 27,000 pieces of orbital debris are tracked by the U.S. Department of Defence's sensors. Millions of fragments of other debris are too small

to be tracked but can still threaten human spaceflight, robotic missions and satellites. Collisions with even the smallest pieces of space junk travelling at 25,000 kmph are akin to high-speed car crashes on earth.

Most of the debris is tracked from earth and relies on NASA and the U.S. Department of Defence's Space Surveillance Network, as well as the U.S. Air Force's space-tracking system that uses ground-based sensors. In Europe, Toulouse-based company Share My Space is among a small group of private companies offering the service, tracking artificial satellites and space debris, using its ground-based telescopes.

But it wants to go one step further. With the help of EDA, it could develop a project to put 12 microsattellites into space to monitor space junk with much greater accuracy. If successful, every 90 minutes, the satellites would be able to send back a full scan of a region in space and allow companies to make trajectory decisions. "No sensor at ground level can give that kind of precision," says Norbert Pouzin, a Spaceflight Dynamics Engineer at Share My Space. "To have precise and accurate data on all orbits, at a high time-frequency, you need the combination of a ground-based and space-based observation system. A surveillance constellation will only be high-performance with a full network of ground-based sensors linked to it," Pouzin says.



© Share My Space

Collisions are not theoretical either. According to the European Space Agency, the first-ever accidental in-orbit collision between two satellites occurred in February 2009 above Siberia, when a privately-owned U.S. communication satellite, Iridium-33, and a Russian military satellite, Kosmos2251, collided. Both were destroyed.

The microsattellites form the essence of Share My Space's winning proposal for the EDA's 2022 Innovation Prize. While the €30,000 prize money can only be seed money considering the potential €48 million cost for the development of the satellite and €720 million cost for the whole project, including the constellation of the 12 microsattellites, it does bring the company publicity and credibility, Pouzin says. "It shows we have the know-how and will help us put this proposal at the ministerial level in France, and at the European level."

Share My Space's proposal would involve sending up the microsattellites with three crucial pieces of technology: a narrow field of view photo sensor telescope, a 'fish-eye' wide angle camera, and a laser to track objects. This winning idea of Share My Space could lead to an 'Ad hoc Category B project', under the R&T portfolio of EDA. "In essence, this project idea could be co-funded by the Member States and with additional participants within the Ad Hoc Working Group (AHWG) under the RTI directorate in EDA," says Eleni Patouni, the AHWG Space Moderator. In this case it would likely create a consortium to build the satellite, working on the basis of a 30-month development cycle, with a five-year mission.

As in previous years, EDA's Innovation Prize competition was very high, not just in terms of the number of proposals – 15 in all – but

also in terms of quality. "This year, we added an incentive to promote the participation of small and medium-sized enterprises, including start-ups, and give them the opportunity to bring their innovative proposals to the defence sector," says Jean-François Ripoche, EDA Director for Research, Technology and Innovation (RTI).

Ripoche says that Share My Space was selected because "it proved to be very innovative, proposing a solution based on a dedicated satellite's constellation, which would provide more continuous coverage and a high accuracy position of the detected objects. By combining this architecture and the latest optical sensors technology, this proposal will put EU defence at the forefront in space surveillance." As the amount of space junk is set to steadily increase, Share My Space's proposal could not have come sooner. [K](#)

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