

# EDM

EUROPEAN DEFENCE MATTERS

*What the first Coordinated Annual Review on Defence reveals*

## CARDS on the table



> A 'STRATEGIC COMPASS'  
FOR THE EU'S CSDP  
EEAS' Charles Fries  
on what to expect

> CIRCULAR ECONOMY IN  
DEFENCE  
The Commission's new  
Incubation Forum

> EDA INNOVATION  
PRIZE 2020  
And the  
winners are...

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# Playing the CARD right

To solve a problem efficiently, good practice calls first for a thorough and honest analysis of what is wrong only then to be followed by tailored corrective action. The EU's endeavour to overcome the fragmentation of its defence landscape and move towards a more homogeneous, collaborative, efficient and interoperable Europe of defence, follows the same two-tier approach.

The first Coordinated Annual Review on Defence (CARD), just endorsed by Defence Ministers, is a crucial piece of work as it offers both elements of the above-described remedy: a plain description of the shortcomings of purely national defence planning and capability development done in isolation; and plenty of concrete recommendations on how to do things better in the future, together. Now, it's up to Member States to make the best of them.

In the following pages, we analyse the key CARD findings and recommendations and take Member States' pulse on the potential take-up of the collaborative opportunities identified by the CARD. We also look at the increasing number of PESCO projects whose implementation benefit from EDA support; also a reminder that the CARD's goal is to spark collaborative projects which must eventually lead to joint defence capabilities.

We also hear from the German EU Presidency's defence & security priorities and get an insight into the ongoing work on the EU's Strategic Compass. Furthermore, we put the spotlight on the Commission's new Incubation Forum on Circular Economy in European defence as well as on EDA's cooperation with the EU Satellite Centre. Finally, we can present the winners of the 2020 EDA Defence Innovation Prize.

We hope you will enjoy this magazine. Should you have comments or recommendations, please get in touch: [info@eda.europa.eu](mailto:info@eda.europa.eu)

**Elisabeth Schoeffmann**  
EDA Head of Media & Communication

**Helmut Brüls**  
Editor-in-Chief



First CARD report published

# Wake-up call and pathfinder

Frank in pointing to existing shortcomings, yet constructive by offering options for improvements to come: the first Coordinated Annual Review on Defence (CARD), steered by the European Defence Agency (EDA) as the CARD penholder in close coordination with the EU Military Staff (EUMS) over the past 12 months, has achieved its double goal which was to review participating Member States' defence activities in order to provide a realistic picture of Europe's defence landscape and to promote cooperation opportunities for joint defence capability development.



**The first CARD report, presented by EDA to Defence Ministers on 20 November, is the outcome of an innovative approach launched four years ago when the EU Global Strategy (EUGS) called for the "gradual synchronisation and mutual adaptation of national defence planning cycles and capability development practices" to enhance the convergence between Member States' military assets and boost defence cooperation among them.**

That said, this was quickly done: EU countries approved the CARD modalities in May 2017, concluded a test cycle in late 2018 before kicking off the first full CARD cycle in September 2019 which, over a period of 10

months, saw EDA collecting and analysing information gathered from individual Member States on their respective national defence plans, in order to identify current trends (defence spending, ongoing capability programmes) and future cooperation opportunities. The rationale behind the CARD is that the regular reviews, to be done every two years, will lead over time to more synergies and increased coherence between Member States' defence planning, spending and capability development, through targeted cooperation.

#### **Plain analysis**

The CARD report's assessment of the current picture is unequivocal: Europe's

defence landscape remains fragmented and lacks coherence in several aspects, notably as regards defence capabilities and their development: existing capabilities are characterised by a very high diversity of types in major equipment and different levels of modernisation and of interoperability, including logistic systems and supply chains. What's more, the EU's Military Level of Ambition is currently not achievable and the commitment to Common Security and Defence Policy (CSDP) missions and operations is very low with strong disparities between participating Member States in terms of engagement frameworks and overall operational effort. →



Admittedly, the new EU defence cooperation tools launched since 2016 – the 2018 EU capability development priorities resulting from the revised Capability Development Plan (CDP), the CARD initiation, the Permanent Structured Cooperation (PESCO) and the European Defence Fund (EDF) – have led to greater interaction among Member States as regards cooperation, including dedicated projects in the PESCO framework. However, they are too recent to deliver a significant and positive effect on guiding the trends on defence, on de-fragmentation and on increased operational commitment, the CARD report stresses: "National defence interests and related approaches continue to prevail".

**Multinational cooperation still not a priority**

The fundamental problem, the CARD outlines, is that only a few Member States consider multinational cooperation in capability development as a key characteristic of their national capability profile and/or have the national ambition to actively contribute to shaping the European capability landscape.

This is also evidenced by the fact that most Member States miss out on meeting the collective European benchmarks on 'collaborative equipment procurement' (minimum 35% of total equipment spending) and on 'collaborative defence R&T' (minimum 20% of total defence R&T spending), which were commonly agreed more than a decade ago and adopted as individual PESCO commitments in December 2017.

Consequently, defence spending on collaborative projects remains scarce, also because budget allocations made by Ministries of Defence to previously launched national programmes leave limited margins for manoeuvre for collaborative defence spending until the mid-2020s. In the same vein, the outlook for defence research and technology (R&T) spending levels continues to be insufficient, putting the EU strategic autonomy at risk, the report warns.

**Action is needed: Here's a plan**

The CARD's most distinctive added value, however, is that it does not limit itself

**"Europe's defence landscape remains fragmented and lacks coherence in several aspects"**



to running a diagnostic of the current situation: it also puts forward numerous options, potential action points and recommendations to Member States on how they can overcome the shortcomings, if they wish to.

Those recommendations cover the three domains – all interlinked – where more European thinking and action are deemed indispensable to overcome the current fragmentation of the European defence landscape: defence spending, defence planning and defence cooperation.

#### Defence spending

Governments must avoid falling back into the pre-2015 period when defence budgets kept shrinking year by year. Instead, they should sustain the (albeit moderate) trend of increasing national defence expenditure witnessed since 2016 to assume a credible role in defence for the EU. Now that the COVID-19 pandemic and its financial burden are putting additional pressure on defence spending, potential cuts should



## CARD process: step-by-step towards the first report

- **19 June 2019:** EDA's Steering Board in Capability Director's formation approves the CARD Methodology which will guide the process.
- **September 2019 - March 2020:** EDA, in cooperation with the European External Action Service (EEAS) and the EUMS, gathers what is known as the CARD's 'initial information' (Member States' national defence spending, capability plans, defence cooperation ideas and opportunities) and holds bilateral dialogues with each of the 26 participating Member States. Those bilateral talks serve to validate the CARD's initial information, explore collaborative opportunities, and discuss broader issues relevant to the EU defence landscape such as the implementation of the EU capability development priorities, coherence of defence planning and European defence cooperation.
- **April 2020 - June 2020:** EDA processes the CARD's initial information provided by the participating countries to produce what is known as the 'CARD Aggregated Analysis'. Therein, the Agency aggregates and assesses the data to identify patterns and possible trends in the European defence landscape. It also analyses Member States' responses to the collaborative opportunities presented to them to derive potential focus areas for them to concentrate their efforts on. In addition, operational efforts and associated capability requirements are analysed by the EUMS and then integrated into the Aggregated Analysis which is presented to the Steering Board in Capability Director's formation and the European Union Military Committee (EUMC).
- **July 2020 - November 2020:** EDA, in close coordination with the EUMS, extracts political conclusions from the CARD Aggregated Analysis and proposes related recommendations to participating Member States with the aim to improving the coherence of the European capability landscape. The draft CARD report is presented to Member States' Capability, Armaments and R&T Directors as well as the EUMC before it is presented to Defence Ministers meeting at the EDA Ministerial Steering Board on 20 November 2020.

be systematically compensated through focused collaborative projects on capability development and R&T, making full use of the EU defence initiatives, including the EDF. Ministries of Defence should also increase the share of R&T related expenditure within national defence budgets to deliver

on cutting-edge technology for defence capabilities at national and EU level, including collaboration.

#### Defence planning

This is probably the most crucial ingredient for moving towards a more coherent →

# CARD-recommended 'focus areas' for cooperation

The first CARD report recommends Member States should concentrate their collaborative capability development efforts on 'next generation' capabilities in the following six focus areas:



**Main Battle Tank (MBT)** – CARD recommends the joint development and acquisition of a next generation MBT in the long term (entry into service mid-2030s), and joint modernisation and upgrades of existing capabilities in the short-term. If Member States cooperate in upgrading or collaborate when introducing new ones, a reduction of types and variants by 30% by the mid-2030s can be obtained. 11 countries expressed an interest in cooperation going forward.



**European Patrol Class Surface Ship** – CARD recommends replacing coastal and offshore patrol vessels within the next decade and develop an EU-wide approach for modular naval platforms. Opportunities for cooperation in joint off-the-shelf procurement, common logistics for similar vessels, common future functional requirements were found with 7 countries expressing an interest in cooperation.



**Solider Systems** – CARD recommends modernising soldier systems through joint procurement of existing systems in the short term, including harmonising requirements, developing a user group for Joint Virtual Training & Exercises utilising common IT tools. In the long-term, develop commonly shared architecture by mid-2020s for all subsystems using cutting edge technology. 10 countries expressed an interest in cooperation going forward.



**Counter UAS / A2/AD** – CARD recommends developing a European capability to counter Unmanned Aerial Systems (UAS) to improve force protection as well as contributing to establish a European standard for Anti-Access/Area-Denial (A2/AD). In the A2/AD area, cooperation is key to enable integration of air defence systems and combined assets, which is the only way to cope with modern threats in modern engagements in coalition operations.



**Defence in Space** – CARD recommends developing a European approach to defence in space to improve access to space services and protection of space-based assets. As an emerging operational domain, more collaboration would contribute to a greater involvement of Ministries of Defence and recognition of military requirements in wider space programmes conducted at EU level.



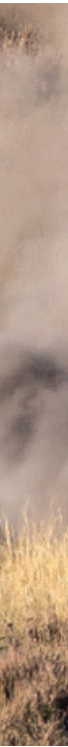
**Enhanced Military Mobility** – CARD recommends more active participation of all Member States in military mobility programmes, notably air and sea lift transportation, logistic facilities and increased resilience of related IT systems and processed under hybrid warfare conditions by the mid-2020s.

**"New collaborative projects in the six focus areas can have a significant impact on both Member States' capability profiles and the coherence of the overall European capability landscape"**

European capability landscape: Member States need to think and plan their national defence capability development from a wider European perspective, systematically looking for cooperation with other countries. Therefore, they need to consistently consider and make the best use of the existing EU defence cooperation tools (CDP, CARD, PESCO, EDF) in their own national defence planning processes. The 'focus areas' identified by the first CARD report (*see box*) should facilitate this process and, *in fine*, lead to collaborative projects implemented under PESCO, at EDA or in any other multinational format. Member States must get used to jointly preparing the planning horizon (beyond mid-2020s) for increased and more substantial cooperation in capability development in a structured and more targeted manner, making EU cooperation the norm.

### Defence cooperation through joint projects

This fundamental change of mindset in national defence planning should trigger more multinational capability projects and programmes. To get there, it is necessary that Ministries of Defence use the EU defence tools to engage in and commit to proposed collaborative opportunities (capability development, R&T, industry) in







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order to bring their defence apparatus into line with each other.

Which are the most promising cooperation opportunities identified by CARD?

#### Collaborative opportunities and focus areas

The first CARD identifies a total of **55 collaborative opportunities** throughout the whole capability spectrum, considered to be the **most promising, most needed or most pressing** ones, as well as in terms of operational value. Based on this catalogue of identified opportunities, Member States are recommended to concentrate their efforts on the following six specific 'focus areas' which are not only covered by the EU Capability Development Priorities agreed in 2018 but where the prospects for cooperation are also looking particularly good (encouraging number of interested Member States, national programmes already underway or in the pipeline), namely:

- Main Battle Tanks (MBT)
- Soldier Systems
- European Patrol Class Surface Ships
- Counter Unmanned Aerial Systems (Counter-UAS)
- Defence applications in Space
- Military Mobility

Launching new collaborative projects in the six focus areas can bear a "significant impact on both Member States capability profiles and the coherence of overall European capability landscape", the report states.

In addition to that, **56 options to cooperate in R&T** have been identified as well. The latter range from Artificial Intelligence (AI) and cyber defence, to new sensor technologies, emerging materials and energy efficient propulsion systems as well as unmanned systems and robotics.

#### Conditions for cooperation "favourable"

The CARD reveals that conditions for multinational cooperation in all six capability focus areas are "favourable", as well as from a time planning perspective. Therefore, a broad participation of Member States can be expected in collaborative projects related to those areas, at system and subsystem levels, which includes linking these new collaborative projects to already existing programmes, the report finds.

It therefore urges Member States to make full use of all identified collaborative opportunities (especially to inform national defence planners, including the next

wave of proposals in the PESCO context as well as the upcoming EDF annual work programmes).

The report also stresses that collaborative development of capabilities in these six focus areas requires industrial cooperation for prime contractors, mid-caps and SMEs with positive effects on the competitiveness of the European Defence Technology and Industrial Base (EDTIB).

#### Better equipment for CSDP missions

An enhanced collaborative approach is also needed in order to connect capabilities together and improve readiness, preparedness and interoperability of forces to be used in CSDP operations and missions, the report says, notably in those areas of the identified major capability shortfalls which appear to be less likely addressed without common involvement. This would enable the EU to effectively conduct part of the most demanding operations, it concludes. In order to boost the Union's operational CSDP performance in the short and medium term, the report recommends Member States to concentrate on the following priority areas for operational collaborative opportunities: Power Projection, Non-Kinetic Engagement Capabilities and Force Protection. **K**

# After the first CARD: What's next?

Now that the first Coordinated Annual Review on Defence (CARD) has delivered its output, it is up to Member States to grasp the many cooperation opportunities highlighted in the report. After all, the CARD is only the beginning of a process designed to trigger collaborative projects leading to joint capabilities able to strengthen Member States' Armed Forces and Europe's collective military clout.

So, where to go from here?

We took the pulse of Ministries of Defence asking a sample of them – key decision-makers from **The Netherlands, Romania and Spain** – to answer three identical questions on their country's views and intentions as regards the CARD follow-up.

We also invited **General Éric Bellot des Minières**, the current Chairman of EDA's Steering Board in Capability Directors' composition, to share his views on the CARD follow-up in an exclusive Opinion Editorial.



**Arie Jan De Waard**, Armaments Director at the Dutch Ministry of Defence



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# "CARD shows areas where cooperation is most needed and urgent"

## 1 What has been the biggest added-value or lesson learnt of the first CARD, from your perspective?

The CARD report and analysis is a great work for which I applaud and thank the European Defence Agency (EDA). It underlines the broad knowledge and expertise of EDA. CARD is showing us the overall defence capability landscape. It clearly indicates that the landscape is rather fragmented, still not very coherent and interoperability is not guaranteed.

To overcome this, Member States need to synchronise their planning and coordinate the spending. This will take time but at least, through the clear recommendations, the CARD shows us directions and areas where cooperation is most needed and most urgent.

## 2 In concrete terms, how does your country intend to use the CARD findings and recommendations?

For the Netherlands, the CARD analysis has clear recommendations which we are staffing at the moment. To mention some of them that look very promising to us:

- development of the soldier equipment programme: cooperative projects in that field will lead to more interoperability, in my eyes one of the main objectives of collaborative work;
- development of Counter Unmanned Aircraft Systems (CUAS): they are very important to counter one of the future threats;
- Military Mobility (MM): for us, as the Lead Nation of the PESCO project on MM, this would also be an area to develop further cooperative efforts;

- Artificial Intelligence (AI) applications for defence and human factor aspects such as manned/unmanned teaming are important. They are among the promising topics for longer term research.

The Netherlands will definitely work on those projects. I would also suggest that we use the next few months to take a closer look at the CARD analysis and decide on promising options for further cooperation at our next EDA National Armaments Directors (NADs) Steering Board Meeting in March 2021.

## 3 With the first CARD report delivered, are we moving closer to a Europe of Defence?

In order to arrive at a synchronised coherent picture, ideally, the CDP and the Overarching Strategic Research Agenda (OSRA) guidance as well as the CARD outcome lead to the selection of high priority projects that are taken forward either under PESCO or the classical EDA framework or some third alternative.

The European Defence Fund (EDF) would support these initiatives with financial means. I do realise that the EDF has another legal base and sits in another framework, however it is our common effort to connect the two worlds and spend the EDF smartly with projects that really matter.

Therefore, the CARD results need to be part of the annual EDF work programme discussion. Following this logic of coherence, the CARD capability picture should inform the discussions on the Strategic Compass regarding the 'capability box'.

So, yes with CARD delivered, we have another strong tool for EU defence cooperation.



**Simona Cojocaru**, Romanian Defence State Secretary and Chief of the Ministry's Department for Defence Policy, Planning and International Relations



# "Time is ripe for new phase in implementation of EU defence initiatives"

## 1 What has been the biggest added-value or lesson learnt of the first CARD, from your perspective?

The CARD process has already proved to be a crucial instrument in providing us with a comprehensive state of play regarding cooperation in developing defence capabilities, as well as a pathfinder for the implementation of EU priorities.

Taking the next step to increase convergence between national defence plans and EU collective endeavours requires a gradual synchronisation and mutual adaptation of defence planning processes and enhance our capability development practices.

At the same time, ensuring complementarity and avoiding duplications between CARD, as well as the Capability Development Plan (CDP), and respective NATO processes, such as the NATO Defence Planning Process (NDPP), is key for the fulfilment of our efforts.

With the first CARD report on the table, it is now the right moment to assess the implementation and achievements of the CARD process and look at the challenges awaiting us in the short and medium term.

Given the role expected to be played by CARD, this would probably be the main EU vehicle to harmonise and synchronise the process of addressing the shortfalls, and this should be duly synchronised with the NDPP.

## 2 In concrete terms, how does your country intend to use the CARD findings and recommendations?

Romania remains keen on making progress to better integrate EU initiatives and processes into the national defence planning system. Beyond the harmonisation of the planning processes we are also seeking coherence of output in concrete terms, demonstrating that the complementarity of efforts also covers projects which deliver results, in particular those developing capabilities under the PESCO framework.

We strongly believe that, through CARD, we could contribute to delivering on the agreed capability priorities, recognising shortfalls and identifying all necessary measures to be taken in order to mitigate their effects.

What is crucial is to establish the output-oriented link between these efforts as the pieces completing the puzzle that will lead to real progress: more effective European defence cooperation which supports Member States to develop the capabilities they really need, together.

As I mentioned earlier, we see the challenge of ensuring coherent capability development which takes into account the trans-Atlantic dimension. With 21 EU Member States in NATO, we have to ensure that EU and NATO defence planning processes are mutually reinforcing and provide a coherent output.

## 3 With the first CARD report delivered, are we moving closer to a Europe of Defence?

In our view, defence initiatives (PESCO, CARD, EDF) set a new level of ambition for the EU in taking greater responsibility for its own defence. These initiatives represent key cooperation tools for a more coherent European landscape of defence capabilities and an integrated approach.

Although the CARD process is quite young and has a positive collective dynamic, we are now more committed to further focus our efforts on embedding the EU defence initiatives into national defence planning processes and to making better use of these tools.

With the results of the first full CARD cycle delivered, Ministers of Defence now have for the first time a full and comprehensive overview of the entire European defence landscape in order to decide what future steps can be made to transform our joint efforts into a more efficient output.

In this context, we expect to see different pieces of the larger picture coming together and getting a new impetus in the efforts to consolidate the EU's role on security and defence. From this perspective we consider the time is ripe to enter a new phase in implementing European defence initiatives and achieve better integration.

To conclude, I want to express the belief that strengthening our cooperation will further contribute to reaching the EU Level of Ambition and to consolidate the EU-NATO strategic partnership.



**Saturnino Suanzes Fernández de Cañete**, Capability Director at the Spanish Ministry of Defence



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# "Spain intends to make the most of the collaborative opportunities identified by CARD"

## 1 What has been the biggest added-value or lesson learnt of the first CARD, from your perspective?

Besides the inherent value of the CARD as a tool to provide decision-makers with useful recommendations and a comprehensive picture of the European defence landscape, I strongly believe that the biggest added-value of 2020's CARD is the completion, for the first time, of a full CARD cycle. This is a milestone in the building of the European capability development process that cannot be underestimated.

In addition, I consider that the six focus areas highlighted in 2020's CARD report, as well as the identification of a large number of collaborative opportunities, provide a solid basis for a renewed European cooperation effort from 2025 onwards.

## 2 In concrete terms, how does your country intend to use the CARD findings and recommendations?

In the current strategic context of growing geopolitical competition between China and the United States, European countries face a formidable challenge. They must collectively preserve their ability to act as credible security providers, by filling-in the defence capability gaps caused by more than one decade of underinvestment, while at the same time dealing with the effects of an unprecedented economic crisis.

Spain intends to make the most of the collaborative opportunities identified by CARD, in order to mitigate the effects of this crisis in its defence budget and, by doing so, also contribute to the development of the priority capabilities required by the European Union to fulfill its Level of Ambition.

## 3 With the first CARD report delivered, are we moving closer to a Europe of Defence?

2020's CARD report is just a baby-step in the endeavour of defragmenting the European defence landscape. At the same time, it is also a gigantic step forward in the longer-term effort of embedding European Union's Capability Development priorities into Member States' planning processes. Results will not be visible in the short term, and we will need to give time before we will start to see the first encouraging results, but it is amazing to realise how far we have moved forward since 2016, when we started to put in place the foundations of the suite of initiatives (CARD, PESCO, EDF...) that we are now using to develop the capabilities required by the European Union.

By the same token I strongly believe that the time has come to concentrate our efforts on achieving greater coherence. Coherence needs to be addressed at all levels: (1) within the EU, by assuring the synchronisation of all the initiatives already in place; (2) at a national level, by guaranteeing a sound integration of EU's capability development tools in national planning processes; and (3) by continuously auditing the input-output link existing between EU's capability priorities and the capabilities obtained by means of multinational collaborative programmes.

Finally, and from a broader perspective, we will also need to persist in our efforts to build a shared European strategic culture. I personally consider this common culture as a pre-requisite to the building of a Europe of Defence; our future Strategic Compass will be instrumental to this end.



# Defence cooperation is needed, urgently!

By General **Éric Bellot des Minières**, current Chairman of EDA's Steering Board in Capability Directors' composition.

**Europe's security environment continues to deteriorate. A rise in threats is relentlessly challenging the world order, and these threats have already destabilised regions bordering Europe. Clearly, if they are not contained, they risk undermining the security of the continent. It is therefore essential that Europeans take more responsibility for their defence. Accordingly, the European Union (EU), at the heart of Europe, must increase its capacity for assessment, decision-making, and to take more effective action.**

I am convinced that ambitious and effective cooperation between the Member States will enable the EU to meet these challenges and establish itself as a security provider.

We have already accomplished a great deal in that regard. We have practical, coherent tools for spearheading a capability development process that is bearing fruit. The particularly encouraging results of the 2019 European Defence Industrial Development Programme (EDIDP) have clearly underscored this. 16 projects were thus selected, 9 of which were duly launched under the Permanent Structured Cooperation (PESCO). Almost 80% of the grants awarded in 2019 will be allocated to them.

Among the capability initiatives of the EU, the CARD plays a central role. It provides an overview of the capability areas and proposes cooperation opportunities for Member States. There is no doubt that the CARD is a valuable instrument for fostering cooperation between Member States.

## **A fragmented capability landscape**

The first CARD review is done. The European Defence Agency (EDA) and the EU Military Staff (EUMS) have jointly accomplished remarkable work, of noteworthy quality and relevance. Insightful conclusions have been drawn. My main impression is that the European capability landscape is still very fragmented, too fragmented. This has an impact on the interoperability of European Armed Forces and diminishes the effectiveness of the investments of each Member State. For example, in 2017, the Robert Schuman Foundation<sup>1</sup> estimated that this 'lack of Europe' had cost nearly EUR 25 billion, or 11% of the annual defence budgets of the Member States.

We can and must do better! We have the ability to build a strong Europe that is able to shape its own destiny.

## **Let's act together – and now!**

I am convinced that we will achieve our goals by making full use of the capability

tools created by the EU. In just a few years, we have created the relevant capability mechanisms from scratch. Let's take pride in the remarkable work that we have done. These instruments form a coherent, output-oriented system, intelligently interlinked with the NATO Defence Planning Process (NDPP).

Of particular note:

- The European Union Global Strategy (EUGS) sets the security and defence objectives of the EU and its Member States. The Strategic Compass will allow this strategic ambition to be more precisely defined. This is a welcome and promising initiative.
- The Headline Goal Process (HLGP) identifies and prioritises the capability gaps which have to be addressed to achieve the level of military ambition of the CSDP. Acknowledging these needs will mean that the Member States will devote most of their capabilities to the EU.
- The Capability Development Plan (CDP) offers solutions for addressing such gaps through cooperation. The CDP is a driver for providing the defence industry with a full capability picture. As such, it is vital that its capability spectrum is broad and does not change too frequently.



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- The Permanent Structured Cooperation (PESCO) promotes the convergence of Member States' defence policies, enabling them to cooperate better. We must concentrate all our efforts on respecting the 20 common commitments underpinning PESCO.
- The European Defence Fund (EDF) adopts a multiannual approach to subsidising structural and inclusive capability projects responding to duly expressed military needs. When developing these projects, the Member States would benefit from exploring the six focus areas identified by the CARD. It is a relevant source of inspiration which should usefully feed into our reflections on the future.

- The CARD is the driving force behind capability cooperation. It measures the level of EU capability development and proposes collaborative solutions to the Member States for improvements.

It is clear that soft power is no longer enough to contain the insecurity now raging at the borders of our continent. "Europe cannot and must no longer outsource its security and defence."<sup>2</sup> It is therefore essential that the EU is more active in particular in encouraging cooperation between Member States, as in the end they are the legitimate users of military force. [K](#)

<sup>1</sup> Question d'Europe, No 486, Robert Schuman Foundation, Paris-Brussels, 1 October 2018.

<sup>2</sup> Jean-Claude Juncker's statement at a high-level conference on defence, Prague, June 2017.

General Éric Bellot des Minières (aged 56) was promoted General on 1 November 2020. During his military career, he served in many foreign operations, inter alia, in Chad, Djibouti, Rwanda, Somalia, Central African Republic, Kosovo and Afghanistan.

# CARD must be used "wisely and effectively"

The first Coordinated Annual Review on Defence (CARD), an impressive piece of information-gathering and analytical work, was steered by the European Defence Agency (EDA) as CARD penholder in close coordination with the EU Military Staff (EUMS). In the following opinion piece, EUMS Director-General, French Vice-Admiral Hervé Bléjean, reflects on the CARD's importance and gives his view on the role the EUMS played in it.

**Interest in security and defence has grown considerably over the last few years, with the EU strengthening its role as a global player and security provider. Surging interest in this field – fired by Brexit, an increasingly assertive Russia and the US administration's unpredictable attitude towards Europe's security – led to the 2016 EU Global Strategy (EUGS) and, consequently, to an increased Level of Ambition on Common Security and Defence Policy (CSDP).**

In the wake of this strengthened commitment, the EUGS triggered a chain reaction paving the way for a more ambitious CSDP in which achieving a sustainable level of strategic autonomy and sovereignty is an essential EU requirement. In an unprecedented move, the EU launched several capability-based initiatives as part of the EUGS implementation. Among others, the CARD was established as a link between national defence planning and EU priorities.

## Great potential

I would like to underline the great potential the CARD has. In fact, it puts in our hands an important new tool which we have the responsibility to use wisely and effectively to achieve tangible results. It allows defence planning and spending information, that has

been shared by individual Member States on a bilateral level, to be pulled together into a comprehensive aggregated picture of the EU's defence landscape which will foster a common and deeper understanding of our security and defence environment.

As part of the CARD secretariat, the EUMS was fully engaged in this first 2019-2020 cycle and cooperated well with EDA and the European External Action Service. It has nurtured the CARD on one of its main areas of responsibility: the planning of the EU military capabilities.

In fact, besides our operational duties, we are called to support the Council in the remit of the so-called "Headline Goal Process" where, under the guidance of the EU Military Committee (EUMC), the necessary political guidance and the military requirements are set, where Member States' existing capabilities are collected and analysed, and where the main EU military shortfalls are identified. All of that with one big common objective: the fulfilment of the EU military Level of Ambition. To this purpose, a specific set of High Impact Capability Goals (HICG) has been defined by the Council since 2018 to help and guide Member States in achieving specific and tangible results in the short and medium term.



## "Invaluable information exchange platform"

In this perspective, the CARD has offered invaluable help because it allowed the EUMS to measure to what extent the EU is taking care of its major strategic shortfalls through the implementation of the High Impact Capability Goals and, at the same time, build a comprehensive picture of the EU's engagement in operations and missions. In other words, the CARD permitted to highlight major connections between the EU security & defence landscape and the EU CSDP with a focus on its military Level of Ambition.

From an EUMS perspective, the CARD represents an invaluable information exchange platform allowing Member States to share notable information in the field of capability planning and development and, more importantly, discuss and shape EU guidance in the defence field with a view to progressively building a deeper common strategic culture.

For the first time ever, the CARD Secretariat and the EUMS as part of it held a comprehensive





The low commitment to CSDP missions and operations is confirmed by continued force generation problems.

Looking at the root causes, a fragmented perception of strategic threats appears to drive Member States' defence postures. Differing perceptions of the security situation and the disparate strategic orientation of Member States' foreign and security policies remain a key issue. They drive Member States' defence profiles and shape their operational efforts.

To conclude, as stated by High Representative Josep Borrell, the EU is a "player in search of an identity" and we need to strengthen our efforts towards building a stronger European strategic culture. In this perspective, the CARD has great potential to inform the development of the Strategic Compass, which may connect and bring national perspectives on security and defence closer, pursuing a deeper common "strategic culture".

discussion on security and defence directly with every Member State in its own capital, thus fostering a broader European dialogue on these issues. The CARD bilateral dialogues were particularly beneficial as they were conducted back to back with the Headline Goal Process and bilateral NATO meetings. In this regard, the CARD and the Headline Goal Process have benefitted from each other. This has led to a more effective and coherent information-sharing thereby providing the EUMS with a deep and clear insight into the factors that influence national defence planning processes. It also allowed the EUMS to draw a realistic picture of Member States' efforts in CSDP operations and missions.

At the same time, the CARD is also functioning as an effective decision-making platform with direct results for the Ministers of Defence through the presentation of the final report.

In this context, the CARD has the potential to inform national defence planning processes and, consequently, increase coherence in national capability planning and

development. This will foster cooperation among Member States through the identification of collaborative opportunities for capabilities development. In this regard, the EUMS has identified specific priorities areas among the High Impact Capability Goals, addressing major shortfalls that so far have passed 'under the radar' and, due to their nature and size, need to be overcome with a collaborative approach. They cover three domains: Power projection (e.g. aircraft-carriers and amphibious capabilities), Non kinetic capabilities (e.g. Cyber effects, Strategic Communication) and Force Protection (specifically high-end Ballistic Missile Defence).

One of the main outcomes of the CARD is that the EU CSDP military Level of Ambition appears not to have been fully embraced by national security and defence policies. This has led to a fragmented EU security & defence landscape in terms of national defence postures which affects Member States' forces, capability profiles and operational footprint, with direct consequences for their commitments to operations and missions.



Vice Admiral Hervé Bléjean officially took over the command of the EU Military Staff (EUMS) and the Military Planning Conduct Capability (MPCC) at a ceremony held on 30 Jun 2020.



A photograph of a fighter jet on the deck of an aircraft carrier. The jet is the central focus, with its cockpit and canopy visible. In the background, the sea and another large ship are visible under a clear sky. The overall scene is bright and clear, suggesting a sunny day.

# Helping hands

Having the Coordinated Annual Review on Defence draw Europe's current defence landscape and identify opportunities for collaborative capability development – two taskings the CARD delivered on in its first report – was never meant to be an end in itself, but a crucial stepping stone towards concrete multilateral capability projects.

Expectations are thus high that the CARD's results and recommendations will actually be taken up by Member States and feed into the EU's Permanent Structured Cooperation (PESCO), for subsequent review by future CARD cycles. To help get PESCO projects off the ground, the European Defence Agency (EDA) offers to participating Member States a variety of customised support options. With growing success.

**While EDA has always been recognised for initiating and supporting multinational capability development and R&D projects implemented under its own auspices, the Agency's growing support for PESCO projects is probably less known, but all the more important.**

This got off to a quiet start in early 2018 by providing modest administrative support to a couple of PESCO's smaller-scale projects, but has since grown to more than a dozen, including some involving major weapons platforms. (See text boxes for various PESCO projects supported by EDA.) And more are in the pipeline.

"Collaborative projects are an integral part of our DNA," says EDA Chief Executive Jiří Šedivý. "Having the Agency provide this kind of support to PESCO projects was a natural progression of what we have long done for other defence projects."

The Agency, which jointly runs PESCO's secretariat with the European External Action Service, including the EU Military Staff, offers three forms of support to PESCO projects.

#### **Administrative support**

The first is administrative support by helping a PESCO project to organise meetings, and providing rooms or facilities for →



project-related work and meetings. "This has proven especially valuable during the Covid-crisis," said Darius Savolskis, EDA PESCO policy officer. "Many physical meetings were planned for spring 2020, when the pandemic's first wave hit Europe, and these had to quickly be moved over to virtual formats, which we've enabled through EDA available tools."

Some of the PESCO projects that have requested this kind of support are led by smaller Member States. "While those countries don't always have experience in the management of complex multinational projects, the advantage of the smaller or softer PESCO projects is that they will deliver results faster than the bigger ones," he said.

For example, the PESCO project led by Lithuania to develop rapid response cyber-defence teams "will deliver stand-by teams ready for intervention quite soon, and that will be a good thing," observed Savolskis. "Given enough time, PESCO will start delivering bigger things, too, but it requires some 'strategic patience' until then."

### **Consultancy and expertise**

The Agency's second form of PESCO support is consultancy and expertise. "Here, we agree on the specific tasks we'll carry out for a project. This could entail support in capturing the detailed operational and technical requirements, as well as developing its ConOps (concept of operations) by a certain deadline or defining specifications for its technical study," he observed.

### **Fully-fledged EDA project**

The third form of support, however, applies when participating members of a PESCO project choose to establish their project as a so-called ad hoc Category B (Cat. B) project at the Agency, which means other Member States can choose to opt into, or join, the endeavour at a later stage.

"This is our most extensive form of support where the Agency functions as the project manager," said Savolskis. "The project members, of course, will decide how much responsibility to give the Agency. At the same time, however, we have to take into account the resource and time implications of doing that – will it fit into EDA's workload, in-house expertise, and




**"Having the Agency provide this kind of support to PESCO projects was a natural progression of what we have long done for other defence projects"**

### At a glance: List of PESCO projects whose implementation is being or has been supported by EDA

Project Co-ordinator	Project Title
<b>EDA project</b>	
AT	CBRN Surveillance as a Service (CBRN SaaS)
BG	Deployable Modular Underwater Intervention Capability Package (DIVEPACK)
IT	European Patrol Corvette (EPC)
<b>Consultancy and expertise</b>	
LT	Cyber Rapid Response Teams and Mutual Assistance in Cyber Security (CRRT)
BE	Maritime (semi)Autonomous Systems for Mine Countermeasures (MAS MCM)
FR	European Secure Software defined Radio (ESSOR)
FR	Materials and components for technological EU competitiveness (MAC-EU)
<b>Administrative support</b>	
DE	Geo-meteorological and Oceanographic (GEOMETOC) Support Coordination Element (GMSCE)
FR	Materials and Components for Technological EU Competitiveness (MAC-EU)
DE	Cyber and Information Domain Coordination Centre (CIDCC)
FR	EU Collaborative Warfare Capabilities (ECOWAR)
FR	Timely Warning and Interception with Space-based TheatER surveillance (TWISTER)
RO	European Union Network of Diving Centres (EUNDC)
RO	CBRN Defence Training Range (CBRND TR)

priorities? That can involve some heavy work such as the project's contracting and financial oversight, managing, organising work group agendas and meetings and so on."

Normally, the Agency absorbs as a matter of routine all the indirect costs – contracting, legal services, etc. – of supporting PESCO projects. Because the project will rely on the Agency's resources paid by all the EDA countries, the Cat. B project requires the approval of each EDA participating Member State. And it may require a contribution-in-kind from the PESCO consortium such as seconding personnel to the Agency's headquarters in Brussels to help manage the project. 



### *With a little help from the Agency*

Focus on a selection of EDA-supported PESCO projects

## CBRN Surveillance as a Service (CBRN SaaS)

The first PESCO project that asked for EDA assistance for its development as a fully-fledged Cat. B project is known as 'CBRN SaaS' (CBRN Surveillance as a Service). Launched in 2018, it brings together Austria, as the lead country, with four other EDA Member States: Croatia, France, Hungary and Slovenia.

EDA will oversee the Cat. B project, from defining the technical requirements to developing the prototype systems' design and testing.

Despite the project's rather cryptic name, CBRN SaaS aims for a very important goal for Member States' Armed Forces: to come up with concepts for combining and integrating commercial and military off-the-shelf components onto unmanned aerial and ground vehicles in order to detect and identify Chemical, Biological, Radiological and Nuclear (CBRN) threats and create a recognised CBRN picture.



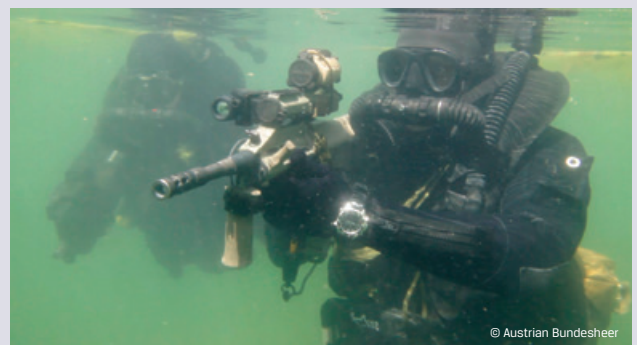
With prototyping pegged for 2023, the project will demonstrate the viability of a rapidly deployable, 24/7 CBRN surveillance plug-in module to augment a common operational picture. It will benefit either military or civil security users, and thus can be used across a wide range of missions.

A crucial technical challenge will be to ensure that future capabilities emerging from the project are interoperable with national legacy CBRN surveillance systems. CBRN SaaS's main deliverables will be a technological demonstrator that provides a proof of concept; a roadmap identifying what future modules could be developed; a concept of operations; and a service availability concept to reach the full operational capability.

## DIVEPACK

One of the PESCO projects supported by EDA, focused on specific niche capability, is DIVEPACK. Its aim: to develop a full-spectrum package of defensive underwater 'intervention' capabilities that can handle everything from search-and-rescue support to naval mine countermeasures or harbour protection to underwater repair, salvage or demolition tasks. The intended users do not include special operations forces, however.

Launched in April 2020, DIVEPACK's envisioned modular design will be based on an open plug-and-play architecture to link together scuba-equipped personnel with unmanned and remotely-operated underwater vehicles. The various capability packages will fit into standard-size container modules that are transportable by either land, air or maritime means, and operated by specialised personnel. DIVEPACK's technology goals, for example, are fully aligned with the priorities found in the EU's Capability Development Plan, which is steered by the Agency.



Under the related Cat. B project, EDA has a major oversight role for DIVEPACK's preparatory phase, namely to oversee harmonisation of its military requirements, elaboration of its business case, and other documents needed for a smooth acquisition phase afterwards.

Once the requirements are defined, they will be handed over to the project at the beginning of 2022, after which its four participating nations – Bulgaria, France, Greece, Romania – will have to decide on the way ahead: how the system will look, and then signing contracts with industry to deliver DIVEPACK's prototype for testing in 2024.

## European Secure Software Defined Radio (ESSOR)

Efforts to develop advanced Software-Defined Radio (SDR) technologies resonate deeply at EDA, which has long supported various research and developmental efforts toward that end for more than a decade.

The 'ESSOR' PESCO project not only builds on those efforts but takes the same name as a previous research effort, which first surfaced in 2008. ESSOR's main objective is to create a common SDR architecture and standardised waveforms. Together, this would offer a reference point for SDR developments across Europe.

It's a project with many strands of work – from defining technical requirements to framing the right industrial solutions – and big implications for interoperability between Member States' Armed Forces. That explains why ESSOR has nine participating countries (Belgium, Finland, France, Germany, Italy, Netherlands, Poland, Portugal, Spain) and another four as observers.

EDA's involvement with the ESSOR PESCO project has been in its initial but primary stage, namely to facilitate the development of an ESSOR's concept of operations (ConOps). The ConOps aims at describing the operational needs, visions



and expectations of the operational users (from tactical level to component command) on the information flows and new waveforms. "We did a ConOps study in spring 2020 which includes several scenarios, and we're using that to shape the project's work," said Darius Savolskis, EDA policy officer for PESCO.

"The ConOps itself should be updated very soon, probably in November. After that, ESSOR will have to decide whether to continue with the further support of EDA in parallel to carrying the results over to OCCAR (the Organisation for Joint Armament Co-operation)," he said.

ESSOR's industrial work is slated to begin in early 2021, with a budget of €37 million, already secured from the European Commission's precursor budget for the European Defence Fund, known as the European Defence Industrial Development Fund, to support capability development and prototyping.

## European Patrol Corvette (EPC)

The European Patrol Corvette (EPC) is one of the most ambitious PESCO endeavours that EDA will soon take under its management wing.

A four-nation project (France, Italy, Greece and Spain) of significant scale, EPC's goal is to produce a prototype for a new class of 3000-tonne naval ship. Its common mono-hull platform will be no greater than 110 meters in overall length, based on a flexible, modular approach designed to accommodate different systems and payloads. This novel approach enables each nation to tailor the baseline platform to its particular capability needs, thus enabling a wide range of missions.

EPC will be a significant undertaking. "This is one of the most prominent PESCO projects we have, which is also quite



challenging because of different requirements of project members" said Darius Savolskis, EDA's PESCO policy officer.

Indeed, the sheer scale of the project demands a 30 month period just to harmonise all its operational requirements, a task "for which our Agency has the responsibility to oversee," he said, noting that EDA "will not write the requirements, but will manage the whole process."

The EPC group of nations aims to produce its first corvette prototype in 2026-2027.

# German EU Presidency: Strengthening the EU on security & defence

In the following article, German State Secretary to the Federal Minister of Defence, **Benedikt Zimmer**, outlines the main challenges, key assumptions and goals of the current German EU Presidency (second half of 2020) in the field of security and defence.



## Challenges in times of crises

The current pandemic is probably only the discernible culmination of a development that has already posed great challenges to both the international and our European community. It will certainly continue to put the rule-based international order and the global balance of power under perpetual pressure. The concentration of crises in the 21st century will also have far-reaching consequences for the EU. Now, more than ever, we need to stand together in the EU, unified by a clear vision regarding our values, interests and ambitions. Our citizens expect a strong EU. An EU that protects and defends them facing any kind of crisis.

However, especially COVID-19 has the potential to serve as a catalyst and even aggravate current and future conflicts. We therefore have to take action to prevent the ongoing health crisis from transforming into a security crisis.

## Key assumptions

Despite the progress made in deepening the EU's Common Security and Defence Policy (CSDP) over the past years, the ongoing crisis has revealed not only strengths but also weaknesses in our system.

The first 'lessons learned' illustrate the necessity to focus on two core issues.

As a start, the EU needs the capacity to provide support and assist in the direct and immediate management of the crisis. In the long run, we have to be able to act in order to position ourselves in a post-COVID-19 order, especially in the domain of security and defence. Increasing resilience will empower the EU to be a capable and reliable partner in international crisis management through acting in a solidary, effective and cooperative manner. To achieve this, a close cooperation and coordination between Europeans as well as their transatlantic partners in NATO is essential. To advocate for these necessary improvements, the German Presidency of the Council of the EU





has taken a slightly different course than initially planned.

**Goals of the German Presidency**

Given these manifold challenges, a central goal of the German Presidency of the EU Council is to enhance European resilience in the area of security and defence comprehensively. We will actively work towards consolidating and building the EU's role as an anchor of stability with the ability to act as a global player in international crisis management. To achieve this, we will intensify the close coordination with all stakeholders, aiming for a new impetus of cooperation.

European cohesion and solidarity are the guiding principles of the German Council Presidency. Without them, even the best instruments remain ineffective. We believe that all EU Member States should continue to work hand in hand to further enhance CSDP and to stay in close coordination with our partners. First and foremost, we need to be clear about our intentions and objectives. With the Strategic Compass, we want to find the much-needed commonly agreed basis between EU Member States on this overarching question. This increased strategic clarity will help us to plan more prudently and to act more decisively – if and when European action is required. This

will also provide more transparency for our partners. The initial step is the first common threat analysis at EU level.

At the same time, given the current challenges due to the COVID-19 pandemic, we are already increasing our responsiveness. With the PESCO project 'European Medical Command (EMC)' at its core, European Medical Cooperation 2.0 will lead to higher resilience and closer cooperation among the Armed Forces of the EU. Going beyond the EU, the EMC will closely link with NATO's Multinational Medical Coordination Centre (MMCC) and thus create a vivid symbol of →

**"We will actively work towards consolidating and building the EU's role as an anchor of stability with the ability to act as a global player in international crisis management"**



much-needed closer cooperation between NATO and the EU.

We are aiming for an EU that is able to act -with partners or if necessary on its own - appropriately and decisively where its interests, values and security are affected. As key instrument, PESCO must strive to meet ambitious objectives during the upcoming second initial phase 2021-2025. We will actively support making tangible progress in PESCO and its projects as well. This includes finalising the provisions for Third-States' participation. We are convinced that the participation of Third States in PESCO projects, especially of Allies and close partners, is in everyone's interest. Furthermore, it is important that we continue to invest in defence and thereby substantiate our ambitions with the necessary funding.

For the first time, a defence title is integrated into the EU budget through the European Defence Fund (EDF) and Military Mobility. We want to make sure that we finalise the EDF regulation as quickly as possible in order to start funding concrete projects for common and interoperable capabilities, thus closing European capability gaps.

As coherent political coordination and decision-making in the Council are essential to progress in this matter, we will start a consideration process, ideally based on the Strategic Compass, in order

to explore ways to improved Strategic Capability Planning in the EU. This planning should take into account the overall picture of the European capability landscape to ensure a more comprehensive planning and a more coordinated decision-making, including coordination of capability contributions of EU Member States. This should be based on existing procedures within Council structures to ensure a clear political monitoring and guidance as well as close cooperation and coordination of all actors involved.

The success and credibility of our operational efforts also depend on our ability to not only train, but also to sufficiently enable our partners in missions. We want to make sure that through the European Peace Facility, the EU will for the first time become a full spectrum security provider. To this end, we will be working towards an EU that has the necessary means at hand to plan, conduct and command its Operations and Missions effectively. Furthermore, we want to achieve the certification of the Military Planning and Conduct Capability. We intend to enhance cooperation between civilian and military structures in this area. The EU's resilience also needs improvement in the digital field and through innovative digital solutions. This is why we strive to advance efforts to strengthen digital skills and cyber defence capabilities of the Member States' Armed Forces.

The current COVID-19 pandemic may only be one of several crises throughout the 21st century, but it emphasises the necessity to develop an EU that is more resilient and able to act towards a variety of different challenges. This will require more cooperation and coordination between all EU Member States. Within its Presidency of the Council of the EU, Germany will contribute to strengthening this development through forward-looking projects, encouraging the following Presidencies to continue pursuing this approach. Together we will take a significant step forward towards an EU that stands ready to defend and protect its citizens, and acts as an anchor of stability in an unstable world. 

Benedikt Zimmer was appointed State Secretary at the Federal Ministry of Defence in Berlin on 5 April 2018. The Directors-General for Equipment as well as for Cyber and Information Technology report directly to him. Mr Zimmer is also responsible for the Directorate-General for Planning affairs. Before being appointed State Secretary, he served as Director-General for Equipment at the Ministry from 2014 to 2018.

Towards a Strategic Compass  
for the EU

# Concrete solutions for concrete challenges



In June, EU Defence Ministers commenced work on a 'Strategic Compass' to be adopted in 2022 to guide the implementation of the EU's Level of Ambition on security and defence. Building on a threat analysis, the Compass will define policy orientations and goals in areas such as crisis management, resilience, capability development and partnerships. In the following Opinion Editorial, EEAS's Deputy Secretary General for CSDP and Crisis Response, **Charles Fries**, shares his analysis and expectations on the work underway.

**The urgency of the EU's new security initiatives launched in recent years is not diminishing.**

On the contrary: recent events in Belarus, Mali, Libya and Nagorno-Karabakh confirm how deeply unstable countries and regions in our direct vicinity are. At the same time, direct threats to the EU's security, for example through terrorism, hybrid threats and cyber-attacks are growing as well. Moreover, we see a more geopolitical competition between major powers at the global level, exacerbated by the COVID-19 crisis.

These challenges affect our security and strategic position, and compel us to work even harder to become more resilient and more effective in security and defence. It is therefore imperative to fully implement the

new security and defence initiatives and take concrete steps forward to enhance the EU's strategic autonomy.

To give new impetus, based on an up-to-date understanding of the evolving security situation, High Representative Josep Borrell proposed to develop the Strategic Compass: a new political strategic document to be adopted by the Council in early 2022. It provides an opportunity to tackle the most pressing political questions that the Union faces in the area of security and defence.

**Reinforcing a common understanding of threats and challenges**

The first step in the development of the Compass is the presentation of a

comprehensive analysis of threats and challenges. Based on input from EU national civilian and military intelligence, this analysis will map the key trends, challenges and vulnerabilities that the Union faces in the medium term. It is the first time that the EU undertakes such an effort. This intelligence-led document provided a substantive basis for the discussion Defence Ministers had in November to start elaborating the Compass.

Following the threat analysis, we will engage in a strategic dialogue with Member States to assess the implications for our policies. This dialogue should enable Member States to reinforce their common understanding of the security threats we collectively face, or, in other words, to enhance the European security and defence culture. →

### "It is imperative to fully implement the new security and defence initiatives and take concrete steps forward to enhance the EU's strategic autonomy"

#### Improving the Union's ability to act

The Strategic Compass should address the growing need, in a volatile world, to be able to act quickly and decisively as a security provider. Enhanced engagement through CSDP missions and operations, with more robust and flexible mandates, is key. We also need to have strong civilian and military command and control structures. The Military Planning and Conduct Capability (MPCC) has already been mandated to be able to plan and conduct an executive military operation (approx. 2500 troops) besides their ongoing role limited to training missions. The question is, however, whether this structure is sufficient for the EU's Level of Ambition set in 2016.

Member States' contributions, both to missions/operations and to the MPCC, are currently lagging behind. The Compass should address this issue and its underlying causes. We must ensure that our operational engagement is in line with our political decisions, for example those taken in the PESCO framework. The Compass could be used to work on incentives to make it easier and more attractive for Member States to contribute, for example by making the mandates of missions and operations more flexible, by extending the financing of common costs and further operationalising the integrated approach. The European Peace Facility, which should enter into force at the beginning of next year, should already be a good step in the right direction.

Furthermore, we need to be better prepared for the future, for example by regularly

conducting 'contingency planning' for possible future operations. We could for example assess if we would be ready if a crisis in our neighbourhood requested quick and effective EU action. Or how we can further develop the Coordinated Maritime Presence-concept, after a successful pilot project in the Gulf of Guinea. In other words, we should do a 'stress test' from time to time and ask ourselves regularly the question whether the EU would be able, willing and capable to act in a certain crisis scenario.

#### Better protect the Union and its citizens

Addressing conflicts and crises beyond our borders also contributes to our own security at home. We need to be better prepared to protect ourselves and strengthen our resilience. We should address vulnerabilities in the security and defence sector, including drawing lessons from the COVID-19 pandemic. This is why the Compass should help strengthen the EU's position in strategic domains such as cyber, maritime security and space. The Compass should also address disruptive technologies affecting security and defence, such as Artificial Intelligence or quantum technologies that support an innovative European Defence Technological and Industrial Base.

The Compass could also contribute, from a security and defence perspective, to the protection of European critical infrastructures, security of supplies or even access to raw materials. This should lead to strengthening the EU's resilience in critical sectors as well as the EU's ability to counter hybrid threats. Furthermore, we should elaborate on the use of EU instruments such as the Mutual Assistance Clause (article 42.7 TEU) where discussions are already ongoing.

#### Strengthening our capabilities through cooperation


If we want to enhance our ability to act and protect ourselves better, we need the right capabilities. Defence cooperation has been high on the agenda for many years and the European Defence Agency (EDA) plays a significant role in this regard. Yet, the EU still lacks critical military capabilities. The Compass should therefore guide

the existing EU capability planning and development instruments by setting clear goals and objectives that help overcome these critical gaps. The responsibility of the Member States to make defence cooperation the norm and fill critical gaps together should in this regard be further promoted.

#### Working pro-actively with our partners

In a world of disorder, the EU needs partners. To cope with the evolving security context the Compass should help to promote a more strategic approach to partnerships. It should identify concrete ways in which the EU's cooperation in peace, security and defence with partner countries and partner organisations, notably with the UN, NATO and OSCE, as well as the African Union and ASEAN, can be reinforced. This should contribute to the overall aim of the EU to promote multilateralism, including in the area of security and defence.

#### In conclusion...

I know that I am putting forward a very ambitious approach to the Strategic Compass, but we live in challenging times and we need to find common answers to the questions that I raised. Together with the Member States and with the support of EDA and the Commission, we will address these challenges in the months to come with a focus on concrete solutions. 



Charles Fries was appointed as the European External Action Service's (EEAS) Deputy Secretary General for CSDP and crisis response in February 2020. He previously served as the Ambassador of France to Turkey and Morocco.

# Advancing Circular Economy in Defence

As concern for climate change grows, so do efforts to mitigate it, with the EU having led the way. At the forefront of its initiatives is the European Commission's Green Deal, unveiled in December 2019. A central part of it is the "Circular Economy Action Plan", which aims to boost the recycling of resources, lower waste levels and, crucially, to reduce Europe's dependence on imported strategic materials and components.

**This has direct implications for the European defence industry which needs to turn greener to reduce its environmental impact while strengthening Europe's strategic autonomy. The European Defence Agency (EDA) will be working closely with the Commission via a new "Incubation Forum" to generate cooperative project ideas for Member**

**States, to help steer them toward a more circular defence.**

By some estimates, a well-implemented circular economy in general could reduce Europe's consumption of new materials by more than 30% within 15 years and by a whopping 53% by 2050. However, to get there, Member States' energy-and-resource

intensive defence forces will need to join the effort as well, by looking at the overall 'circular' possibilities, from additive (or 3D) manufacturing techniques to reforms of their procurement rules.

Within EDA, the notion of a circular basis of consumption and production that loops in European Defence well pre-dates the Green →



Deal's launch. As early as 2016, the Agency commissioned a study from Cambridge University to examine if and where national Armed Forces had greened their activities and procedures, and how these could be applied more widely across EDA's then 27 Member States' militaries.

"That study, completed in November 2017, definitely demonstrated the circular economy's interesting potential and many advantages for defence," says Pierre Di Toro, EDA's Policy Officer for Industry engagement & EU policies as well as access to EU funding. "Not only did it point to those Member States who are addressing the issue, but also to the need for a more structured and collaborative approach across their Armed Forces."

### **EDA-Commission cooperation**

Preparations for such an approach are in the pipeline. In February, based on an EDA Steering Board mandate, the Agency officially began consulting with the Commission's Directorate-General for Environment (DG ENV) about the potential of circularity in defence within the new EU

Green Deal. The concrete goal? To explore whether the share of the EU LIFE Programme under DG ENV management could provide EDA with funding to help transition Europe's militaries to a more circular footing.

EDA has already been cooperating with the European Commission (namely DG Energy and the Executive Agency for Small and Medium-sized Enterprises) on topics related to the European Green Deal to promote energy efficiency methods across national militaries, for example. That led to the creation in October 2015 of the "Consultation Forum for Sustainable Energy in the Defence and Security Sector" (CF SEDSS), a European Commission funded initiative managed by EDA which is still thriving.

As for the circular approach to European Defence, "the first milestone was to embed this idea at the highest political level of the European Commission by putting it to the Commissioners themselves. Essentially, we asked the following question: could you entrust EDA directly with EU LIFE budget, because as an intergovernmental EU Agency, EDA should not be treated as

any other player (e.g. industry or private research groups) to compete for funding," observed Di Toro. Last June, the European Commissioners approved the required amendment to the EU LIFE Programme, thereby entrusting EDA with the budget.

As a result of this, the Commission's DG ENV and EDA plan to sign the final grant agreement by early 2021, in order to launch a new forum to help apply the Green Deal's Circular Economy approach to the European defence sector. Mainly funded by the DG ENV's long-standing LIFE programme (under its environmental actions) and managed by EDA, it will be called the "Incubation Forum for Circular Economy in European Defence" (LIFE IF CEED). A two-year effort, it will have an initial budget of at least €900,000, with DG ENV contributing 55% and the balance coming from the Defence Directorate of Luxembourg's Ministry of Foreign Affairs.

### **Incubating projects**

The new initiative will organise conferences and workshops bringing together experts from defence ministries, industry, national research centres and universities to

exchange innovative ideas and share lessons learnt on the best practices and ways to apply the circular economy concept to the defence sector.

"The main aim would be to incubate cooperation projects with as many Member States as possible – things with a concrete impact," Di Toro said, adding that EDA's constituent defence ministries may at anytime define the specific topics for the future forum's work. "If we can come up with clearly defined projects, with groups of Member States willing to develop them, EDA will search funding at European level to implement and make them happen".

There are several potential circular economy-related aspects for Europe's militaries to tackle. These include additive manufacturing, energy and environmental improvements, smart materials, green procurement rules, the recycling of materials and supplies often thrown away after use, and revisions to national laws that could open the door to a more circular economy in defence.

Ministries of Defence's procurement rules are also an incredibly challenging part of the whole circularity equation, according to Di Toro. "To what extent is circularity already there? Well, to the best of our knowledge: not enough yet," he said. "The scope for improvements is simply vast, from mandating the eco-design of commercial-off-the-shelf technologies to the recycling of batteries to more use of electronic communications for reducing paper consumption. Indeed, digitalisation, which is nothing new, becomes a key principle for the circular economy."

Industry-wide participation will be important. "We want all defence-related and dual-use sectors that sell to the military, to become involved in this Incubation Forum to provide DG ENV and other Commission's DGs with relevant feedback so that future EU policies on circular economy are defence-friendly regarding the EU's rules on procurement," he said.


### Tackling regulatory barriers

One early IF CEED priority could be to analyse the regulatory barriers that unintentionally obstruct Member States' Armed Forces

from implementing circular best practices. Here one could think of practices that lack attention to environmental and recycling aspects, such as outdated storage and disposal techniques for ammunition.

The reduction or re-use of operational waste is a key circular economy goal, as would be requirements that commercially produced goods and supplies which militaries purchase have longer life-cycles built into them. Europe's armies obviously seek that for their weapons and platforms, but there are many other areas of military activities that could be reoriented toward circular efficiency and recycling, such as clothing or other personnel gear. For instance, the Dutch army has moved determinedly in this direction in recent years (see box below).

Finally, ensuring that all militaries reference as much as possible the EU's REACH (Registration, Evaluation, Authorisation and Restriction of Chemicals) directive would be another important objective.

Due to the ongoing COVID-19 pandemic, it is difficult to predict when the Agency's new circular economy forum will be able to hold its first physical meetings. "Here we clearly have an issue", explains Di Toro. "For the time being, the pandemic means only virtual meetings can be organised, which is not the best for building together new collaborative projects based on the necessary high levels of trust and confidentiality that are inherent to the defence sector. We'll have to keep our fingers crossed for the new year, hoping that actual meetings will steadily take place again," he said. 



## Dutch circular ingenuity

While there are almost endless possibilities for circular efficiencies for Member States' militaries, some are more obvious than others. One surprising source is soldiers' clothing and personnel items, as shown by the Dutch Defence Ministry.

Traditionally, any used workwear and gear would be incinerated to prevent misuse, which meant everything had to be entirely replaced. It was also expensive, costing the MoD €500 000 per year to destroy materials that still had re-use value in them. In 2017, the government's central procurement entity for clothing and personnel equipment, known as KPU, began applying circular principles to its purchases of uniforms, helmets, specialised gear, and other personnel equipment for the 60,000 personnel across the country's navy, army, air force, and military police. The goal was to extract re-useable materials, extend all the items' service life, and thus reduce waste.

KPU's textile recovery effort now generates additional annual revenues of €750,000 for the Ministry, while saving 14,500 tonnes of CO<sub>2</sub> each year – a sterling example of smart procurement via closed-loop recycling.

Interview with European Commission (DG ENV)  
Director-General Florika Fink-Hooijer

# "Circular economy is a clear business case for defence"



## What role does Circular Economy play in the European Green Deal?

The Commission's Circular Economy Action Plan is one of the flagship initiatives of the European Green Deal. Through this Action Plan we want to lead Europe towards a more resource efficient, clean and climate neutral economy. The circular economy is a new economic model for the EU. It proposes a change in the way we produce and consume to become more resilient, more innovative and more resource efficient – and partly more autonomous.

It is also a great opportunity for companies who will be more competitive by being more circular. On the one hand, because a more circular economy will help Europe to decouple economic growth from resource consumption. On the other, because the circular economy offers a key contribution to achieve a climate neutral Europe. The 2019 Ellen MacArthur Foundation/Material Economics Report tells us that greenhouse gas emissions are not falling quickly enough to achieve climate targets and switching to renewable energy can only cut them by 55% of what is needed to reach the 1.5 degrees target. The remaining 45% of emissions must come from how we make and use products, and how we produce food.

## Why is it important to have the defence sector also included in the EU's Circular Economy?

The European defence industry generates a total turnover of €100 billion per year and 1.4 million highly skilled people are

directly or indirectly employed in the sector in Europe. Like any sector, there are still untapped opportunities to ensure a reduced environmental impact. The circular economy presents a clear business case for the defence sector to be more sustainable while keeping up the competitiveness of the defence industry.

To integrate circular economy models into the defence sector successfully means that the models must not only address resource consumption but also the priorities of the armed forces: namely capability, performance, security of material supply, efficiency and research and technology. Innovation and new business models brought by increased resource efficiency, development of new materials, promotion of secondary raw materials and more sustainable public procurement will in turn not only preserve the environment but also ensure security of supplies, create new jobs, reduce costs for SMEs and larger companies and make the most of public spending.

## Can you already anticipate what impact the EU's Circular Economy policy might have on defence capabilities, procurement and industry?

The benefits for defence capabilities, procurement and industry lie in promoting the circular economy through the use of Green Public Procurement criteria, for instance, to foster circularity in uniforms and clothing, or supporting remanufacturing, reparability or reverse logistics. Moreover, a large part of the defence sector is composed of SMEs – which

would particularly benefit from net-savings. Setting up collaborations with the private sector can also establish a productive discussion and exchange of knowledge around the requirements, opportunities, limitations and barriers to the introduction of the circular economy in defence.

For example, in the Netherlands, the Dutch Ministry of Defence, uses circular principles to reduce waste and extend the service life of uniforms, helmets, and other personnel equipment for the navy, army, air force and military police. In Portugal, some pilot programmes have been set to integrate recovery and reuse of materials into the future maintenance of jets without affecting military efficiency and operational capacities. These and other actions throughout the product lifecycle and the value chain can reduce the environmental externalities of Defence, while ensuring efficient collaboration and cooperation within the community, which is a good way to support inclusive change. I understand that these efforts do not start from scratch, as the European Defence Agency (EDA) has already started exploring the topic with reports and individual projects aiming at improving the knowledge base, and also to measure impacts.

## How can the Commission help the defence sector move towards Circular Economy? Is there EU funding available for this purpose?


The circular economy is one of the building blocks of the European Green Deal, Europe's strategy for sustainable growth. Funds are available to support all stages of



development of an innovation contributing to the circular economy. For the research phase in the development of new technologies through Horizon Europe, looking for example at research on electronic application for smart equipment. For the related testing through LIFE, which covers at the same time circular economy, natural resources, climate mitigation and adaptation.

For the implementation through the structural funds, at regional and local level for specific military sites or at national and transnational level for a large-scale application. It is important to keep an eye also on the adoption and implementation of the European Defence Fund. The potential long-term gains in technological advancement, capability,

performance, security of supply and efficiency in the defence sector are undeniable.

An EDA project dedicated to circular economy could be a good opportunity to reap the benefits of a more circular economy in the defence industry. We are working together to make this happen. 

## Three questions to...

# Luxembourg's Defence Minister François Bausch

**Luxembourg is a driving force behind the effort to integrate circular economy into defence, in particular through the new Incubation Forum for Circular Economy in European Defence. Why this particular interest and what are your objectives?**

Our quest for sustainable development needs to include a closer look at the life cycle of the various objects and products that we use in our life. We may actually have to question our linear "buy → use → make waste" economic paradigm in favour of a circular approach, in which we design buildings, vehicles, machines and other objects and products in a way, that they can be better maintained, repaired and reused at the end of each 'value cycle', without becoming 'waste' and, if possible, without having to be altered structurally.

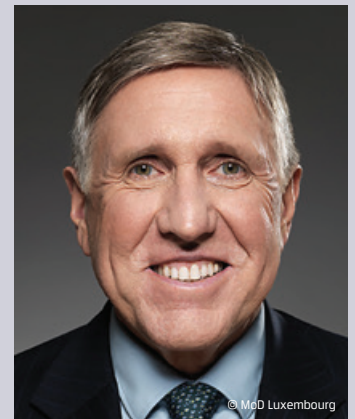
The implementation of this new concept of circularity involves a design that needs to anticipate and include the various maintenance, repair and reuse possibilities of objects and products as well as of their respective components and materials. These possibilities of maintenance, repair and reuse need moreover to be communicated and shared between producers and potential users. Hence, information and data sharing becomes key.

And which sector would be better suited than defence to start testing and rolling out this new concept in which anticipation and forward planning are inherent to the system? Moreover, the community of defence producers and users is often highly specialised and limited to the same sector and there is already an established culture of monitoring and sharing information.

All these arguments have motivated us to support EDA in establishing an Incubation Forum for Circular Economy in European Defence.

**Do you see a potential and willingness for increased European cooperation in this domain?**

As European defence cooperation is growing and some Member States have decided to jointly design and procure new capabilities, the potential is huge.



If implemented at an early stage of the research and technology phase, the mainstreaming of circularity principles into our defence supply chains can benefit European industry and economy significantly. Benefits may include: less pressure on the environment, more resource efficiency and a higher security of supply of raw materials, increased competitiveness, a boost for innovation and economic growth, additional jobs and support for the EU to maintain its leadership in setting international industrial standards.

We are aware of several interesting initiatives in various Member States. But, to our knowledge, none of these has reached a status of widespread implementation so far.

**Do you already have topics or project ideas in mind, which could be brought to the Forum, in view of being shared and implemented with other participating Member States?**

In our view, while taking on board all the experience gained in various pilot initiatives across Member States, it would be important to focus on enabling the operationalisation of circular material, component and product flows in European defence and to address potential barriers, which are often of regulatory, technical, organisational and financial nature, and may impede the implementation of circular economy principles.

Among the enablers, in particular, I see advantages that digitalisation could bring, e.g. helping to increase transparency and data sharing between producers and users of materials, components and products, in particular about how to use, maintain, repair, reuse and, if needed, remanufacture and recycle them after each value cycle.

In Luxembourg, a public-private partnership initiative has developed a "Product Circularity Data Sheet" which is precisely trying to bridge this data-sharing gap and which is currently tested in various industries.

# Natural Partners

The European Defence Agency (EDA) and the Madrid-based EU Satellite Centre (SatCen) have much in common: both are EU agencies with cooperation deeply rooted in their DNA, both serve the EU's Common Foreign and Security Policy (CFSP) and more specifically the Common Security and Defence Policy (CSDP), and both have EU Member States as their primary group of customers. Hence, it is only natural that from the very beginning of their existence, the two organisations have continuously sought – and found – ways and means to cooperate and develop joint initiatives and projects whose added-value is beyond dispute.

**The cooperation between the two agencies started informally and on a working level until July 2016 when a cooperation agreement was signed in the form of an Exchange of Letters between the EDA Chief Executive and the SatCen Director. This agreement laid the groundwork for the harmonisation and synchronisation of the respective annual work programmes through a jointly agreed EDA – SatCen cooperation roadmap. The roadmap is a good illustration of the dynamic and structured cooperation between the two entities which outlines joint activities for the years ahead and can be updated on an annual basis. Any activity included in the roadmap can be launched at any time on a case by case basis.**

"EDA and SatCen are really like-minded EU intergovernmental agencies – combining

the Satellite Centre's operational experience with EDA's proficiency in project management is the perfect complement to strengthen EU defence! They both strive to remain at the cutting edge of technological developments and to continue to stimulate these developments in the field of defence and space", said SatCen Director Ambassador Sorin Dumitru Ducaru.

"Space-based capabilities have become an absolutely critical part of all Member States' defence capabilities and an indispensable tool for any civil/military mission and operation. It is therefore only logical that EDA, as the hub for defence cooperation in Europe, has teamed up with SatCen, the European provider par excellence of space-based assets and services, to help Member States improve their defence capabilities in this crucial domain", stated Jiří Šedivý, EDA's Chief Executive.



## Tangible results

The EDA-SatCen cooperation focuses on delivering tangible results in defence domains where Member States' Armed Forces (and thus Europe as a whole) suffer from a lack of capabilities. While the track record of successfully mastered joint projects and activities is long, the following examples only refer to still ongoing activities which continue to be scrutinised for potential further collaborations:

- The GISMO (Geospatial Information to Support decision-Making in Operations) initiative and the associated GeoHub (Geospatial Information Hub) tool are perfect examples of the good and



## IN SHORT: EU SatCen mission & main activities



© EU SatCen

beneficial cooperation of the two agencies. Starting off as a pilot case in the ISR domain, GISMO has now reached a Full Operational GEOINT Capacity. It includes operational and maintenance functions for a fully-fledged operational capability allowing the safe and reliable sharing of geospatial information (GI) within military headquarters (HQ). Already available in several EU Missions and Operation Headquarters, the extension of the current phase 4 of GISMO will enable its deployment to the EU Operational Headquarters in Larissa (Greece) and Rota (Spain), as well as to the national geospatial centres of EU Member States. →

- The Satellite Centre, headquartered in Torrejón de Ardoz (Madrid area), is an operational agency supporting the EU in the field of Common Foreign, Security, and Defence Policy, primarily by analysing data from space-based assets
- The Centre, currently numbering some 145 staff (composed of agency experts and secondments from Member States), has served its customers for over 28 years: it was founded in 1992 as a Western European Union body and incorporated as an agency into the European Union on 1 January 2002
- SatCen provides fast, reliable, and professional geospatial analysis services to its customers as a solid foundation for EU strategic autonomy in CFSP/CSDP decision making, as well as actionable intelligence for EU missions and operations. As entrusted entity for the

Copernicus Service in Support to EU External Action (SEA), the Centre collaborates closely with the Copernicus Programme

- It also provides other space & security related services as mandated by the Member States: SatCen collaborates in the EU SSA/SST project (Space Situational Awareness / Space Surveillance and Tracking), and participates in various Research and Innovation initiatives



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## SPOTLIGHT: EDA-EU SATCEN COOPERATION

- **REACT** (Radar imagEry Applications supporting aCTionable intelligence) is a joint activity that started in 2016 and is entering its 3rd phase (REACT III) this year. It focuses on improving the exploitation of radar imagery and addresses the associated complexity of acquisition, evaluation and analysis of Synthetic Aperture Radar (SAR) satellite imagery. Associated with Industry, contracted by EDA, the SatCen supports the development of the operational prototype tools and related services. REACT is remotely accessible and available to all EU Member States, SatCen and the European Border and Coast Guard Agency (Frontex).
- **MARSUR** (Maritime Surveillance) is a collaborative project launched by EDA

with currently 20 contributing members. It aims to improve the participating countries' common 'recognised maritime picture' by connecting the various national maritime surveillance systems and facilitating an exchange of operational maritime information and services such as ship positions, tracks, identification data, chat or images. MARSUR networking has been used as support to CSDP Operation SOPHIA. For this purpose, EDA has sponsored the training of MARSUR operators and technicians and a capability demonstration at the EUNAVFORMED OHQ for the Operation SOPHIA in May 2017. It is currently planning to launch, in 2021, its next phase, MARSUR III, to which SatCen foresees continuing its participation.

- **Future SBEO** (Future Space Based Earth Observation systems beyond 2030+), launched in 2017, is a wider initiative as it involves not only EDA and SatCen, but also EU Member States, the European External Action Service (EEAS) including its Space Task Force, and the EU Military Staff (EUMS). It defines the security and defence related technical requirements in terms of spatial and temporal resolution to support military operational phases for EU missions and operations. It introduces and quantifies three proposed solutions (Earth Observation constellations, ground segment and shared satellite imagery) of a multilateral capability development programme for interested Member States. It also includes the opportunity to submit those solutions to the European Defence Fund for potential co-funding.

- **GEONAW** started in 2020 and has the objective to integrate threats posed to Positioning, Navigation and Timing (PNT) functions in a geospatial environment to support Navigation Warfare scenarios, mission planning and operations. The first phase of the project, currently underway, is assessing the technical feasibility of adding PNT threats assessment layers/functions to the existent GeoHub tool. A follow-on phase is planned to start early 2021, aiming to develop a first prototype of an operational tool based on the outcomes of the feasibility analysis and on the collected user requirements.

Other areas for further close cooperation that are under investigation, such as:

- Next generation of (GOV)SATCOM
- Military Space Situational Awareness Network
- Artificial Intelligence applied to the Imagery Intelligence (IMINT) cycle at SBEO ground segment level
- Cyber Defence, CIS
- Research and Technology (RPAS, High Altitude Platform Systems, etc.), CapTech Space Simulation

Member States very much welcome this cooperation that combines EDA's expertise in the fields of governance, harmonisation of technical requirements and project management with SatCen's longstanding operational expertise in providing space-based products and services. 



SatCen Director Ambassador Sorin Ducaru

## IN SHORT: EDA – SatCen cooperation milestones

- The cooperation between EDA and SatCen started shortly after EDA's establishment in 2004 and continuously intensified over the past decade. Both agencies are based on Council decisions and perform complementary activities in the field of CFSP/CSDP
- Since 2016, the agencies collaborate within the framework of an Exchange of Letters between the two directors. On this basis, the annually updated EDA-SatCen roadmap reflects this structured cooperation, outlining joint activities for the year ahead with special focus on the EU space policy and the Union's security strategy
- Key areas for joint projects are geospatial analysis and imagery exploitation, Open Source Intelligence (OSINT) tools and techniques, future space-based earth observation systems, CIS & cyber defence, big data exploitation for space and security, space situational awareness, and maritime surveillance

"We need to collaborate to create our own joint capabilities"



Europe's security, and that of its Member States, will rely more and more on its ability to be up to speed with the most innovative and disruptive cyber technologies to counter growing threats from cyberspace. Lagging behind in this domain compared to the US or China, Europe must urgently overcome its national fragmentation, make a quantum leap in cyber defence cooperation and create the right conditions for research and industry to compete, says **Oliver Väärtnõu**, the CEO of Cybernetica AS, an Estonian cyber company, in the following exclusive interview.

**Some experts predict the next war will happen in cyberspace. With the technological insight you have, is this a real threat?**

I guess it all depends on the definition of war, but a cyber conflict is definitely a threat one has to seriously consider and that has already materialised in various countries, e.g. in Ukraine, Estonia etc. As countries become more and more digital and reliant on technologies, it becomes a lucrative attack vector to our adversaries. For example - why consider the use of kinetic force to attack a powerplant if you can instead organise a cyberattack against it that achieves the same impact when it stalls or interferes with the turbines? Or alternatively, take down a banking, payment system in a country, where the share of cash payments is less than 20%? Or take over control of self-driving

cars and direct them against their users, or pedestrians with possible lethal effects? One can definitely create a lot of havoc and uncertainty only by using cyber as the domain of operation. Moreover, bear in mind that preparing physical attacks often requires much more resources and is so to speak 'louder' than achieving the same goals via the digital environment.

**How well - or badly - are Europe's Armed Forces prepared for such a scenario?**

I think one has to make a clear distinction between, on the one hand, how well the military is prepared to protect itself against cyberattacks; and, on the other hand, how well the military is equipped to protect society against such attacks. Currently the main focus is dedicated to

building up capabilities to protect itself and also, to some extent, to create offensive capabilities. The wider protection of society, however, is not actually under the control of the Armed Forces. In peacetime, civil law enforcement organisations are and should be in charge of the cyber domain, but they need to work closely with the military and share all necessary information with them, as they will have to act in a real conflict situation. In this context, a key aspect is to assess whether an incident is so severe that it is worth declaring a state of war against another country or if it is just a hacking incident that doesn't need escalation. Furthermore, one has also to bear in mind that in the digital space, it is much harder to attribute an attack to an adversary than in conventional warfare. →

### **How competitive is Europe's cyber security & defence industry, compared to other players in the world?**

By looking at the big picture, one can say that Europe so to speak 'discovered' cybersecurity as a domain only when the previous European Commission, headed by Mr. Juncker, took office. Since then it has been one of the priorities of the Commission and also an important topic within the Member States. Of course, cyber incidents during elections, e.g. in Germany and France, have also increased its political importance. Nevertheless, it is fair to say that Europe does not have as strong a cybersecurity industry or companies than the US or Israel or even China. Looking at the investment levels and ecosystems developed via industrial policies, we have a long way to go to compete. Though, the signs today are promising – the EU is directing more funding, initiating discussions, and creating an EU Cybersecurity Competence Centre network to develop expertise in the field. We have good scientific and research potential in Europe, but it does not predominantly express itself in companies but is rather concentrated in research institutes and government institutions.

### **What are the main stumbling blocks for improving cyber defence and security in Europe? What is missing, what needs to change?**

What the EU lacks most, compared to its biggest competitors, namely China and USA, is unity. Today we are in a situation where 27 Member States look at cybersecurity as



something that is critical to their national capability and, therefore, they are keeping their markets closed and their contracts local. Although we boast that we have one of the largest internal markets in the world, it is not really the case for the cyber domain. We hope that the initiatives taken by the Commission, like the European Certification Scheme, will provide means to overcome these issues, but time will tell. Also, we must consider how the European industrial complex works and what is the right balance between public and private sectors? In terms of investments, the situation has improved significantly over the years both from a research investment perspective, as well as regarding access to venture capital. However, comparing ourselves to the US and China, it is clear that we still need more emphasis on funding cybersecurity. For example, Europe does not have a dedicated venture capital industry for cybersecurity companies, like the US does. Another issue that I would like to raise and

that requires our attention, is cross-border and national information sharing. If we want to create knowledge in this domain, we need to build trusted relationships and analyse how acquired data can be utilised by all parties in order to create a joint competitive advantage.

### **How will AI or other new technologies further change cyber defence in the future – both on the defender side and the side of the cyber threat actors, and what does this mean for Europe's security?**

Artificial intelligence (AI) will definitely automate a lot of manual processes, whether scanning the networks, finding vulnerabilities, patching, etc. in the cyber domain. Mind that this capability can be applied both in the defensive and offensive mode. It is most certain that Europe needs to further invest in developing AI capabilities, but, most importantly, it must create environments for AI algorithm training. The



**"We have good scientific and research potential in Europe"**

**What, in your view, is the best way forward for European cyber defence cooperation?**

Europe is a unique constellation. We cannot copy our way from anybody else but have to create it through collaboration, trial and error. If we want to be sustainable, we need to collaborate on the creation of our own joint capabilities - whether it is in the domain of a new fighter aircraft, the building of new naval capabilities or in the pursuance of cyber supremacy. We need to plan resources and operate together even when, at times, trust between Member States might not be the highest. The PESCO and EDIDP initiatives are an excellent start for this joint capability building. In the future, we need to enhance this cooperation, see that the projects will not only be part of a small club of companies and that mishaps will not impede our progress. One thing is for sure - when dealing with innovation and creating new structures, mistakes will be made. One needs to learn from these, not walk away from the endeavours. **K**

bigger the datasets are on which we train our (cyber) AI capabilities, the better these capabilities become. We hear a lot about the supremacy of China in the AI context - note that these kind of centralised governance structures with a smaller focus on privacy enable the creation of enormous datasets for algorithm development and training. Europe has to find its own way on competing in this domain with possibly other supporting technologies, like privacy-enhancing solutions, to provide a serious alternative.

**You are part of the consortium developing the European Cyber Situational Awareness Platform through a project co-funded through the EDIDP. How important is this collaborative project for Europe's cyber defence capabilities and European industries?**

We are honoured and proud to be part of the European Cyber Situational Awareness Platform development. We believe that

one part of the problem in cyberspace is the issue of situational awareness. Namely, how do militaries, governments, and businesses understand their cyber situational posture - what are the assets they own, vulnerabilities and threats they are facing, and what are the risks if something fails or is hacked? Thus, the EDIDP project is of strategic interest to us, both from the content point of view, but also because it provides a unique opportunity to work with different European Ministries of Defence and their cyber units, as well as top national defence companies, like INDRA, Airbus, Leonardo etc. We hope that by the end of this project, countries that we have worked for, will have a cyber situational awareness capability similar to what they have for physical situational awareness today. This, in turn, enables better protection of European troops when deployed on a mission, giving us a competitive edge in conflict situations.

## CYBERNETICA

Cybernetica is an R&D intensive ICT company based in Tallinn that develops mission-critical software systems and products, maritime surveillance and radio communications solutions to over 35 countries across the world.

# And the winners are...



*"Too close to call"* was the jury's verdict after assessing the many excellent proposals received from contenders from across Europe for EDA's Defence Innovation Prize 2020. Hence, the announcement of two winners for this year's contest which rewards the most innovative ideas, technologies and solutions for the countering of swarms of Unmanned Aerial Vehicles (UAVs), in particular to protect land facilities and platforms.



## SWADAR

The first of the two winning projects is called SWADAR (SWarm ADVanced Detection And TRacking) and was proposed by the **Centro Italiano Ricerche Aerospaziali (CIRA)** based in Capua, Italy.

We asked **Domenico Pascarella**, Senior Researcher and Head of CIRA's System and Infrastructure Security Laboratory, to explain and summarise his team's project:

"SWADAR proposes a technological solution for drone-swarm tracking to provide military commanders with an operational picture of swarm attacks. It uses a defensive team of drones, which tracks the hostile swarm from different perspectives. Defensive drones are equipped with proximal sensors to achieve the required resolution and sensitivity. A coordination mechanism and an ad-hoc network ensure the cooperation of the defensive team to maintain optimal performance for tracking. A fusion of the drones' views is also performed to provide the operator with the common operational picture and to assess swarming metrics, which are key indicators to establish the most effective counter-actions and to possibly automate the decision-making of mitigations. Moreover, the tracking solution is extended with the automated recognition of the swarm-attack scenario and with the learning of new swarming behaviours. This guarantees the adaptability of the system in the face of evolving attacks. In the end, the human-interpretability of recognition results is allowed by a module based on eXplainable Artificial Intelligence.

SWADAR aims at supplementing air defence systems by introducing a line of protection against intrusions of drone swarms within critical

infrastructures, both in the military and the civil fields. The same concept may be applied also for the protection of mobile platforms (e.g., convoys of military vehicles). Moreover, SWADAR integrates and customises state-of-the-art technologies, provided by European stakeholders to secure the overall supply chain. For example, drone kits and sensors are produced by European providers. Also, the simulation equipment for the learning of swarming behaviours may represent a core asset for other defence activities.

Currently, a five-year roadmap is envisaged for the implementation of the SWADAR prototype according to an incremental lifecycle, which will release three versions with increasing capabilities. Follow-on activities are expected for the prototype engineering, too. These include the management of safety and cyber-security aspects, looking also at the possible insertion in civil environments (e.g., integration in national airspace)".



CIRA (Italian Aerospace Research Centre) is a company mainly in public ownership created in 1984. The Centre was founded with the aim of performing and promoting research and technological development in the fields of space and aeronautics and enabling Italian enterprises to compete on the international markets. CIRA has the biggest research facilities in the field of aerospace in Italy, with cutting-edge testing facilities and state-of-the-art laboratories.

## Full-Duplex Radio Technology for Enhanced Defence Capabilities Against Drone Swarms

The second winning project is called 'Full-Duplex Radio Technology for Enhanced Defence Capabilities Against Drone Swarms' and was presented by **Rantelon**, an Estonian small to medium-sized company, in cooperation with **Tampere University**, Finland.

**Karel Pärilin**, an engineer at Rantelon, explains and summarises their winning project idea as follows:

"Amongst the principal methods for countering drones and drone swarms is to target the radio frequency (RF) broadcasts from drones and their ground control stations. That generally means detecting those RF broadcasts and subsequently interfering with the reception thereof. Ideally those tasks would take place simultaneously so as to retain situational awareness at all times and deliver the largest neutralisation impact through interference. However, carrying out electronic warfare (EW) operations, such as RF-based detection and neutralisation, in the same frequency band simultaneously is impossible with conventional radio technology. That is because EW equipment that intentionally interferes with any other wireless communication, is also at the same time blinded by that interference. In fact, that same limitation is also present in most other wireless applications that rely on transmitting and receiving information, e.g., civilian wireless local area and cellular networks.

Classically, this limitation is hidden from the end users by employing spectrum division methods that split the transmission and reception into either time slots or different frequency channels. Yet, by introducing full-duplex (FD) radio technology, which is able to cancel the interference that any radio inherently creates upon itself, this limitation can be removed. And FD radio technology is already proven on an academic level. For civilian applications, this simply means that

FD radios will be able to provide a similar level of functionality with half of the spectrum resources that current radios use. That is a significant advantage considering that the RF spectrum is largely congested. For European defence applications, FD radios pave the way for combining different EW tasks simultaneously on the exact same frequency bands, perhaps resulting in truly multifunctional and cognitive radios. Counter-drone applications are just one of the examples of how such combinations allow us to deal better with threats in the RF spectrum – by at the same time enhancing situational awareness and neutralisation efficiency through simultaneous detection and neutralisation, amongst other combinations".



Rantelon is an Estonian company specialised in developing and producing radio frequency (RF) electronics, including low level components and integrated systems, for a range of applications. The company provides solutions from civilian cellular and public safety networks to various signals intelligence and effector capabilities for the defence sector.



Tampere University – the winning project is joint work with assistant professor Taneli Riihonen's team in the Unit of Electrical Engineering. They are currently pursuing research on full-duplex counter-drone and radio shield technologies with support from the Finnish Scientific Advisory Board for Defence and the Academy of Finland.

# Quo vadis EU defence? A look beyond 2030



Will the next decade be decisive for the EU's defence and its ability to take its destiny into its own hands? Will Member States finally abide by their promise made in 1999 at the Cologne Summit, and build a true "capacity for autonomous action, backed up by credible military forces, the means to decide to use them, and a readiness to do so" or will they carry on kicking the can down the road and paying lip service? In trying to answer these questions, one should examine how the EU's defence could develop and what it should look like beyond 2030, says **Frédéric Mauro** in the following Opinion Editorial for *European Defence Matters*.

**What the EU's defence *could* look like is a question that belongs to the realm of strategic prospective and would require a much more sophisticated analysis than permitted within a thousand words. Nevertheless, inspired by the European Strategy and Policy Analysis System's report<sup>1</sup> we can broadly distinguish three categories of drivers.**

The first is constituted by mega-trends which are developments already underway and nearly impossible to change over the

coming decade. We can easily identify two conflicting trends of the sort. One is the willingness of national European leaders to retain as much as they can of their alleged 'sovereignty' and to call the shots for all defence aspects, be that operational (forces), industrial (capacities) or political (decisions). This is the reason why the CSDP is strictly intergovernmental, with little say for the European Parliament nor for the European Commission and almost always requiring unanimity. On the other hand, there is the obvious need for Member States to

build a capability process able to produce an 'operational capacity'. That was the original intent behind PESCO, the Permanent Structured Cooperation, three words that hide the one and only that sums them all up and that really matters: 'integration'.

#### **Sovereignty versus integration**

Until now the national sovereignty approach has always prevailed over the integrationist one. But that could change taking into account catalysts. Those are specific trends with higher degrees of uncertainty, that

**"EU defence will only take off if Member States set up a political body capable of issuing orders to an efficient chain of command and making national forces act as one, with others whenever possible, and autonomously if necessary"**

move faster than mega-trends and thus accelerate or decelerate these trends. We can identify three series of catalysts. The first one is the level of threats. The Union is facing a lot of direct threats coming from both nation states, such as Russia or Turkey, and terrorist organisations. Moreover, it is also facing insidious threats such as disunion, disinformation, or election meddling by actors who see the Union as a foe. How and when those threats will materialise, and on which battlefield, is still unknown. However, the greater the threat is, the more plausible integration becomes. The same works for the second catalyst: the protection granted to Member States by third countries through NATO. Anything that undermines the Atlantic Alliance or weakens NATO strengthens the attractiveness of integration. If NATO were to disappear, integration would impose itself. The third catalyst is made up of the Member States political mindsets. Is it realistic to get all the EU leaders (or at least a majority of them) on the same page, ready to integrate their national defence apparatus into one coherent 'full spectrum force package', what implies specialisation, shared capabilities, and modification of the decision-making procedures? It looks like alignment of planets. That hardly happens in politics. At least without any real game changer.

#### Game changers

These game changers are decisions that shape the future and yet have the lowest degree of certainty. What could be the next 'black swans' after 9/11, the Arab spring, IS, and Covid-19? Nobody knows. However, a war between Turkey and Greece or one between the US and China would deeply affect the way European Member States consider the necessity of being able to defend themselves, by themselves, and for themselves.

Of course, all three categories of drivers – mega-trends, catalysts, and game changers – are interlinked. They will play a positive or negative role in the development of a European defence, but the ultimate face of it in 2030 will also depend on the decisions that must be taken now. As stated in ESPAS's report: "foresight is much more about shaping the future than predicting it".

That leads to our second question: what should the EU defence look like in ten years?

For the last thirty years, in the wake of the Maastricht treaty and abiding by the Monnet's playbook, the question of the European Union's defence has been answered 'bottom-up', 'step by step', building all sorts of industrial cooperation and setting up as many 'tools' as possible, such as the Eurocorps or the Battle groups. This of course was done with a lot of 'pragmatism' which was tantamount to having 'no plan' other than the vague idea of 'doing something'. Unfortunately, that strategy will never beget a genuine capacity for autonomous action. Because even in its most audacious blueprint – PESCO – and its most advanced realisation, the Lancaster House agreement between France and the UK, the fundamental question of the political decision-making process has been deliberately swept under the carpet.

#### Decision-making

Putting generals or defence industrialists together is definitely not the right starting point for the EU's defence. It has been done for twenty years, producing the results we know. EU defence will only take off if Member States set up a political body capable of issuing orders to an efficient chain of command and making national forces act as one, with others whenever possible,

and autonomously if necessary. Much has been said about strategic autonomy. But decision-making is just as important. The number of participants is not relevant. You need only two to disagree. And, even if it may take some time, you can find a deal at 27. In this regard the concept of an avant-garde is misleading. It is more a question of a common perception – some would say 'strategic culture' – and efficient decision-making procedure. Both elements are necessary.

This change of policy would require audacious leaders, big political steps such as the creation of a European Security Council taking decisions by qualified majority, and eventually the assent of the European nations involved. Today that might seem impossible. But so was the fall of the Berlin wall. After all, "with regards the future, it is not about predicting it, but to render it possible" (Saint-Exupéry). ❏

<sup>1</sup> ESPAS – European Strategy and Policy Analysis System – Global trends 2030 – Challenges and choices for Europe – April 2019



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