

# Central and Eastern European countries: measures to enhance balanced defence industry in Europe and to address barriers to defence cooperation across Europe

Dan Jenkins, Giacomo Persi Paoli, James Black, Alexandros Kokkoris,  
Marta Kepe

The work described in this report was done under the EDA contract. Responsibility for the contents resides in the author or organisation that prepared it.

## RAND Europe

RR-1459-EDA

January 2016

Prepared for the European Defence Agency

EDA contract reference: 15.ESI.SC.254

This document has been formally reviewed, edited, or cleared for public release. It may not be cited, quoted, reproduced or transmitted without the permission of the RAND Corporation. RAND's publications do not necessarily reflect the opinions of its research clients and sponsors. **RAND**® is a registered trademark.



# Executive summary

---

## Project objectives and methodology

The overarching goal of this study is to provide the European Defence Agency (EDA) with the analytical means needed to facilitate the effective participation of Central and Eastern European (CEE) countries in cooperative defence industrial programmes and international supply chains across Europe. This forms part of the EDA's wider support for CEE member states (MS) in their efforts to become more active and visible within the European Defence Technology and Industrial Base (EDTIB).

To achieve this goal, the study focused on five main areas:

- Barriers and obstacles to cooperation
- Capacity building opportunities
- Industrial capabilities
- Defence equipment needs
- Opportunities for cooperation.

To investigate these five areas, RAND Europe's study team designed a comprehensive methodology to gather evidence capturing, to the greatest possible extent the national specificities existing in each of the 11 MS subjects of this study: comprising countries in the Adriatic (Croatia, Slovenia), South-East (Bulgaria, Romania), Baltic (Estonia, Latvia, Lithuania) and Visegrad (Czech Republic, Hungary, Poland, Slovakia) regions.

The methodology included a broad literature review of over 360 sources including material provided by EDA (e.g. CEE internal analysis, country profiles and relevant previous commissioned work) complemented by a series of interviews with academics, relevant national agencies in CEE countries (mostly Ministries of Defence), National Defence Industry Associations (NDIA) and, in some cases, SME operating in the defence sector. The interviews were followed by three country visits, which allowed the project team to gain a detailed understanding of the national complexities.

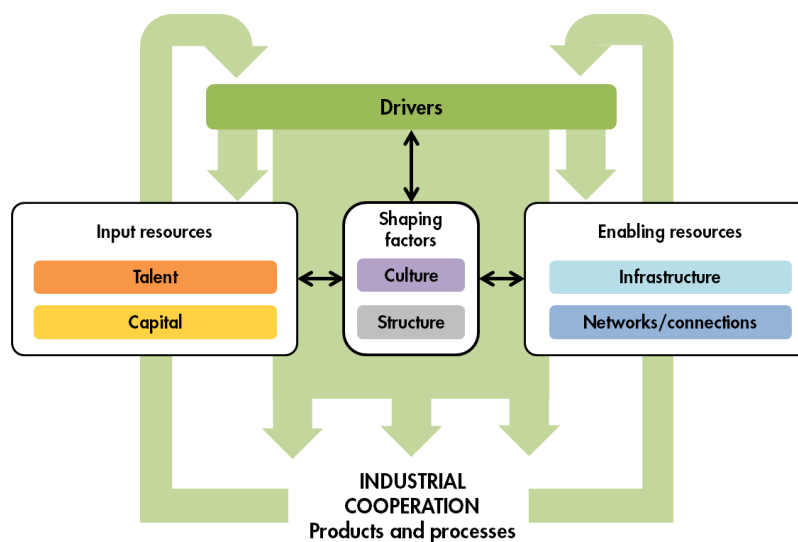
To seek further feedback from CEE EDA MS, the project team also organised a defence stakeholder workshop to present preliminary findings of the analysis and stimulate an open and frank discussion on barriers and opportunities for cooperation. The outcomes of this validation workshop were included in the analysis.

## Summary of main findings

### Barriers and obstacles to cooperation

To structure the analysis of the collected evidence, the study team used a modified version of the RAND Europe proprietary *Defence Innovation Model*. This modified version used seven factors (see Figure Ex 1) to frame the analysis of barriers and obstacles.

Figure Ex 1 RAND analytical framework for understanding the defence industrial cooperation process



Source: RAND Europe analysis. Adapted from Freeman et al. 2015, p. 11.

The table below provides a short definition of each factor and list of the associated barriers identified through the study.

Table Ex 1 Summary of barriers to cooperation by factor

Factor	Definition	Key findings
Drivers	Motivations to engage in cooperation	<ul style="list-style-type: none"> <li>Western primes have a number of perceived concerns regarding the efficiency, transparency and scale of industrial capacity of CEE defence sector (both at the government and industry level). This limits the opportunities for cooperation by hindering CEE industries' ability to enter western primes' supply chain.</li> <li>Within the CEE region, cooperation is often seen as competition to be avoided rather than as opportunity to be pursued. This often leads CEE EDA MS to prefer pursuing linkages with western actors rather than with other regional players.</li> </ul>
Capital	Monetary or financial capital that organisations can access.	<ul style="list-style-type: none"> <li>The generally limited domestic defence spending both in procurement of new equipment and in R&amp;D/R&amp;T limits the opportunities CEE defence industries have to produce and innovate. The shrinking domestic demand, combined with the limited access to alternative funding mechanisms, results in the prioritisation of survivability over cooperation.</li> </ul>

Factor	Definition	Key findings
		<ul style="list-style-type: none"> <li>The lack of long-term budgetary planning also impedes cooperation by generating uncertainty over future commitments (and associated revenues).</li> <li>The high administrative costs associated with the participation in international cooperative programmes or with entering the supply chain of prime contractors discourage participation of CEE industries.</li> </ul>
Talent	Technical skills (e.g. STEM areas) and 'soft skills' (managerial, linguistic, marketing etc.)	<ul style="list-style-type: none"> <li>Both CEE MOD and industries are facing the challenge of having access to sufficient talent to pursue cooperation opportunities.</li> <li>Insufficient 'soft skills' such as project management, foreign languages, marketing and networking, market intelligence and business planning severely impact the ability to create and manage collaborative opportunities.</li> <li>Where technical and managerial talent exists, both CEE MOD and defence industries are facing a strong competition from other, more appealing and remunerating, industries, either domestically or on the foreign market.</li> </ul>
Culture	Organisational behaviour and attitude	<ul style="list-style-type: none"> <li>Cultural barriers exist both at national and international level.</li> <li>At the national level such barriers related to the lack of a culture conducive of cooperation, dialogue and mutual understanding between CEE MOD and national industries.</li> <li>The need for near-immediate financial returns on investment does not support a culture open to cooperation and innovation that requires longer time horizons.</li> <li>At the international level, a diffuse misalignment of different national strategic priorities in the defence sector makes cooperation less likely.</li> </ul>
Structure	Institutional practices and regulations; organisational structure	<ul style="list-style-type: none"> <li>The lack of a defence industrial policy in six CEE countries pre-empts effective engagement between CEE MOD and industry at the national level, and limits opportunities for regional and international cooperation.</li> <li>To enable cooperation it is necessary to improve the coordination between different CEE MOD in the fields of capability and financial planning, and standardisation of requirements. This would allow a more efficient implementation of already existing political initiatives.</li> <li>The EU regulation of the defence market is perceived to put CEE countries in a position of disadvantage compared with western countries, limiting their opportunities to access the wider EU market and participating in cooperative programmes. As a result, CEE industries tend to privilege third markets such as the US or Asia.</li> </ul>
Networks/ Connections	Available facilities (e.g. production plants, research hubs)	<ul style="list-style-type: none"> <li>CEE defence industries often do not have sufficient access to information on market opportunities that would enable them to be a more active player both domestically and regionally/internationally.</li> <li>Inadequate communication often limits the ability of CEE defence industries to establish, or enter, networks with western primes due to the lack of awareness of key actors, processes and procedures.</li> </ul>
Infrastructure	Enablers for information exchange and visibility of business opportunities	<ul style="list-style-type: none"> <li>CEE countries suffer from limited availability of modern manufacturing and R&amp;D facilities, and testing and evaluation sites. This limits their competitiveness on the market and hinders cooperation.</li> </ul>

## Capacity building opportunities

As part of the analysis and synthesis, the study team identified five strategic steps that may support CEE MS in addressing the barriers and obstacle to cooperation and enable greater collaboration across Europe:

- Diversification of capital and funding opportunities,
- Efficiency and improvement initiatives,
- Provision and communication of strategic guidelines for the national defence industry and on defence acquisition programmes,
- Facilitation of the use of the existing knowledge and building an additional knowledge and experience base,
- Facilitation of effective information exchange and cooperation opportunities nationally and internationally.

While CEE MS can already benefit from a wide range of strengths (e.g. skilled workforce, competitive labour rates and technical skills), building on the evidence base we identified areas for further development that the EDA and CEE MS may wish to consider in supporting more effective defence industrial cooperation across Europe; and to drive increased competition through greater participation of CEE industry in prime-contractor led supply chains. Such areas are presented as opportunities for capacity building and are grouped under the relevant strategic step as summarised in Table Ex 2.

**Table Ex 2 Summary of capacity building opportunities to promote cooperation**

Strategic step	Capacity building opportunity
Diversification of capital and funding opportunities	Exploring new methods of financing defence procurements and research at the national level
Efficiency and improvement initiatives	Promote shared use of R&D and testing facilities Encourage vertical integration among companies at both domestic and regional levels Use of independent analysis and oversight of defence resources management
Provision and communication of strategic guidelines	Develop a defence industrial policy supported by a strategic and medium-term capability and armament planning Enhance information sharing between MOD and industry
Facilitation of the use of the existing knowledge	Provide in-house or outsourced 'soft skills' training Facilitate technology diffusion between the civilian and defence industries Conduct improvement programmes to increase skill levels in industry and MOD
Facilitation of effective information exchange and cooperation opportunities	Support national, sub-regional and regional defence clusters

## Defence industrial capabilities

Using an adapted version of the taxonomy used for the EDA’s Defence Industry Directory the study team set out each of the CEE member states’ main industrial capabilities, based on the evidence collected. Table Ex 3 sets out the results of the stocktake of industrial capabilities identified in each of the CEE countries.

Analysis of capability against the group of 11 CEE member states showed that out of the 60 industrial competence areas that exist across the CEE countries no one region or country has a declared capability in all areas, with *Land* and *C4ISTAR* being the dominating sectors.

There is also a degree of duplication of capabilities across each of the 11 member states. While our analysis cannot accurately determine a degree of overcapacity, the study highlights some of the capability areas where duplication of industrial capability exists across three or more countries. The group of Visegrad countries has the greatest degree of duplication of industrial capabilities across its four member states (Czech Republic, Hungary, Poland and Slovakia).

**Table Ex 3 Defence industrial capabilities by CEE MS<sup>1</sup>**

Note: ‘x’ denotes a full life cycle industrial capability against the defence capability area. The ‘x’ highlighted in red denotes an industrial capability to maintain or overhaul but not develop capability.

Industrial Capability	Sector	BG	HR	CZ	EE	HU	LV	LT	PL	RO	SK	SI
<b>Integrated Platforms</b>												
<b>Air Platforms</b>												
Fixed-wing light combat aircraft (e.g. L-159)	Air			x						x		
Fixed-wing jet trainer aircraft	Air			x						x		
Fixed-wing prop trainer and ultra-light aircraft	Air			x				x	x	x		x
Transport/utility/patrol helicopters	Air								x	x		
Unmanned aerial vehicles	Air	x		x	x	x	x	x	x			x
<b>Ground Platforms</b>												
Heavy armoured vehicles (e.g. MBT)	Land		x						x	x		
Light and medium armoured vehicles (e.g. APCs, IFVs)	Land	x	x	x		x			x	x	x	x
Fixed or self-propelled artillery (e.g. 155 mm howitzer)	Land	x		x					x	x	x	x
Unarmoured land vehicles (e.g. transport trucks)	Land			x		x			x	x	x	x
De-mining vehicles and equipment (e.g. DOK-ING)	Land		x		x	x						x
Unmanned ground vehicles	Land		x		x		x					
<b>Naval Platforms</b>												
Small surface combatants (e.g. corvette)	Maritime		x		x		x	x		x		
Fast attack/patrol boats (e.g. RHIBs)	Maritime		x		x		x	x		x		

<sup>1</sup> The table collates information on defence industrial capabilities ‘declared’ by CEE NDIA and MODs, as well as those identified through the RAND study team’s primary research.

## RAND Europe

<b>Industrial Capability</b>	<b>Sector</b>	<b>BG</b>	<b>HR</b>	<b>CZ</b>	<b>EE</b>	<b>HU</b>	<b>LV</b>	<b>LT</b>	<b>PL</b>	<b>RO</b>	<b>SK</b>	<b>SI</b>
Mine counter measures (MCM) vessels	Maritime		x						x	x		
Logistic support and utility vessels (e.g. tankers)	Maritime		x		x		x	x	x	x		
<b>Missiles</b>												
Air-launched munitions (e.g. missiles, bombs)	Air	x				x			x	x		
Surface-to-surface missile systems	Air								x	x	x	
Surface-to-air missile systems (e.g. GROM)	Air		x						x			
<b>Space</b>												
Satellite-related technologies	C4ISTAR			x	x		x		x			
<b>Integrated Systems of Systems</b>												
Command and control systems	C4ISTAR			x	x		x	x	x	x	x	x
Communication systems	C4ISTAR	x	x			x	x		x	x	x	x
Active or passive radar systems	C4ISTAR	x		x				x	x	x	x	
Other surveillance systems	C4ISTAR	x		x	x			x				x
Electronic warfare systems (incl. jammers)	C4ISTAR	x										
Cyber and network security systems	C4ISTAR		x	x	x		x	x	x			
<b>Subsystems and Equipment</b>												
<b>Air Equipment or Subsystems</b>												
Aeronautical propulsion	Air								x	x	x	
Airframe and structure	Air			x					x	x		
Other aviation equipment or parts	Air			x	x		x	x	x	x	x	x
<b>Ground Equipment or Subsystems</b>												
Vehicle structure	Land	x	x	x		x			x	x	x	x
Turrets and weapons systems	Land	x	x	x					x	x	x	x
Other ground sub-systems or components	Land	x	x	x	x	x	x	x	x	x	x	x
<b>Marine Equipment or Subsystems</b>												
Other marine equipment	Maritime		x				x	x	x	x		
<b>Equipped Personnel</b>												
Military clothing and personal equipment	Land		x	x	x	x	x	x	x	x	x	x
Medical and health equipment	Land			x	x	x	x	x			x	
<b>Weapons Systems</b>												
Small arms and light weapons (SALW)	Land	x	x	x		x		x	x	x	x	x
Small arms ammunition	Land	x	x	x			x	x	x	x	x	x
Heavy guns, artillery and turret systems (e.g. remote turrets)	Land	x	x	x					x	x	x	x
Other heavy munitions (e.g. rockets, bombs)	Air	x	x			x			x	x	x	
Mines	Land	x		x								
<b>Protection Components and Equipment</b>												
Protective gear (e.g. ballistic helmets, body armour)	Land		x	x	x	x		x	x	x	x	x
CBRN detection and protection	Land		x	x		x	x	x			x	x
<b>Information Technology and Communication Equipment</b>												
Radio and communication equipment	C4ISTAR	x		x	x			x	x	x	x	x



Industrial Capability	Sector	BG	HR	CZ	EE	HU	LV	LT	PL	RO	SK	SI
Military ICT	C4ISTAR	x	x	x	x	x	x	x	x	x	x	x
Synthetic environments and simulation equipment	C4ISTAR			x	x				x		x	x
<b>Components and Materials</b>												
<b>Components</b>												
Nanotechnology	Other			x			x					
Polymer mechanics & solid state physics	Other		x	x			x					x
Lasers	Other			x				x	x			
Electronic components (incl. defence electronics & sub-systems)	Other	x		x	x	x	x		x	x	x	x
Optics and optoelectronics (e.g. thermal imaging sights)	Other	x		x			x		x	x	x	x
Robotics	Other		x	x	x		x	x	x		x	
Pyrotechnical products including explosives	Other	x		x					x	x		
<b>Services</b>												
<b>Maintenance (Support to Specialist Military Equipment)</b>												
Fixed-wing combat aircraft	Air		x	x					x	x		
Other fixed-wing military aircraft	Air		x	x				x	x	x	x	
Fixed-wing civilian transport aircraft	Air		x	x			x		x	x		
Helicopters	Air	x	x	x		x	x	x	x	x	x	
Land vehicles	Land	x	x	x	x	x	x	x	x	x	x	x
Ship repair and MRO	Maritime	x	x		x		x		x	x		
Communication and IT equipment	C4ISTAR	x	x	x	x	x	x		x	x	x	x
<b>Disposal</b>												
Ammunition recycling and disposal	Land	x		x				x				x
Other demilitarisation, recycling and disposal services	n/a	x		x				x		x		x

### Mapping defence equipment needs

The study also provides an overview of defence equipment needs across CEE MS that were identified through the literature review, information supplied by CEE MOD and Industries and from the EDA. Such equipment needs were mapped using a combination of the data collected through the research (document review and interviews), with data compiled and provided by the EDA (based on national plans and programmes).

The evidence suggests that defence needs vary significantly across the region. This may be due to different national priorities, different defence planning processes or different stages of the current equipment's life cycle.

While from a general perspective any defence equipment need shared by at least two countries could potentially lead to cooperation, given the relatively small size of defence budgets and industrial base, the higher the number of countries sharing the same equipment need the more powerful (in terms of market power) a joint programme would be.

By grouping CEE MS by sub-region, it is possible to identify how aligned the needs/requirements are in each domain/sector. For each domain, Table Ex 4 illustrates the percentage of equipment needs that are shared by at least two countries of the same sub-regional group. In addition, the Land sector has the highest alignment of defence needs across the region, while at the sub-regional level such alignment is greatest in the Visegrad countries.

**Table Ex 4 Alignment of defence equipment needs by sub-region and sector**

	Land	Air	Maritime	C4ISTAR	Protection	Training	Average
<b>Adriatic</b>	60%	14%	0%	50%	0%	0%	21%
<b>Baltic</b>	38%	50%	25%	30%	25%	29%	33%
<b>South-East</b>	40%	0%	0%	11%	40%	0%	15%
<b>Visegrad</b>	71%	54%	0%	58%	38%	89%	52%
<b>Average</b>	52%	30%	6%	37%	26%	29%	

### Opportunities for cooperation

As the first step to identify potential opportunities for cooperation, the study correlated demand for equipment with the related industrial capability (supply) present in the region. The information provided in this study is indicative of potential cooperation opportunities. Promising areas should be further investigated on a case-by-case basis with a view to generating a business case to pursue cooperation.

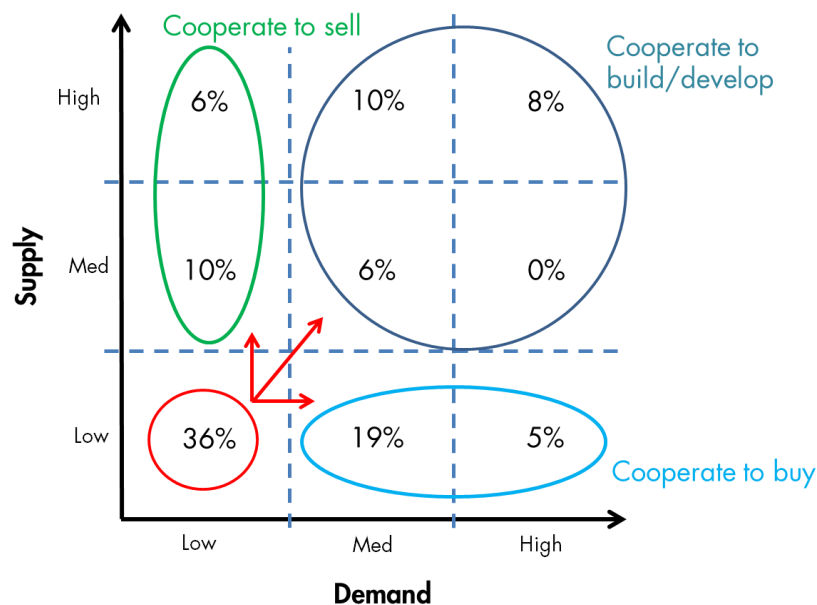
To analyse the different cooperation strategies that CEE MS could pursue, the study team mapped the distribution of the 62 different opportunities across three levels of supply and three levels of demand (Figure EX 2). The percentages shown indicate the proportion of the total number of opportunities that fall within each of the nine quadrants based on our criteria.

Based on the distribution of the 62 opportunities, the study team has identified three possible cooperation strategies (see Figure Ex 2):

- **Cooperate to buy:** pursuing a joint procurement programme to establish a stronger purchasing power on external markets,
- **Cooperate to sell:** establishing an industrial cooperation jointly to pursue opportunities on external markets,
- **Cooperate to build/develop:** establishing a cooperation programme jointly to build (or develop if timelines allow) the required capability.

**Figure Ex 2 Distribution of opportunities for cooperation based on levels of supply/demand and possible cooperation strategies**

**Low:** fewer than 3 CEE MS – **Medium:** between 3 and 5 CEE MS – **High:** more than 5 CEE MS



The majority of current opportunities are concentrated in the ‘low demand/low supply’ quadrant (the red circle). These opportunities are likely to be those most responsive to initiatives aimed at addressing some of the barriers identified through the study. For example, an intervention aimed at the harmonisation of requirements or at the alignment of defence planning may increase the demand for a certain capability, ‘pushing’ some of these opportunities towards the right side of the graph. Similarly, more transparent and harmonised requirements and planning, supported by a more efficient use of available human and financial resources, may induce the strengthening of the industrial base and the development of new capabilities, ‘pushing’ some opportunities towards the top.

## Recommendations

When developing recommendations for the EDA, the study team has sought to focus on areas where the EDA can take action and achieve positive impact. The four recommendations to the EDA focus on a number of different areas of analysis highlighted by the study, mostly in a facilitating and coordinating role, while CEE MS remain an absolute and central part of their effective implementation. As such, these recommendations are as much to the EDA as CEE MS MOD and Industry. In Appendix E, we provide a more detailed breakdown of specific tasks involved in the implementation of each recommendation and the time frames associated therewith.

**Recommendation 1:** The EDA, CEE MS and NDIA/Industry should continue to develop the coordination of industrial capabilities and promotion of cooperative opportunities and strategies across the CEE group of member states

The EDA, CEE MS and NDIA/Industry should continue to use and develop the unique, currently EDA led, MOD & Industry Forum to facilitate a better understanding of wider regional and European industrial capabilities, and closer dialogue between CEE stakeholders. The EDA should facilitate the development of updated terms of reference for this Forum in conjunction with both MOD and NDIA/industry suppliers to provide the basis for the establishment of the Forum as a permanent meeting.

- The updated terms of reference could be used, for example, to establish a rotating (non-EDA) chair for the Forum, outline the ground rules for discussion, and create any working groups or subcommittees desired by CEE MS (e.g. on specific issues such as exports or R&D).
- In addition, the Forum participants could develop issue-specific codes of conduct, for example to address the ethical issues arising from the direct communication between industry and MOD, such as: a lack of transparent decision-making, monopoly suppliers, state support for industry, exclusive arrangements with selected industry, etc. The EDA should help to facilitate this process, with involvement from relevant external actors (e.g. Transparency International or other non-governmental organisations).
- The Forum could be supported through the development and active use of a dashboard and set of metrics to measure the progress of the CEE MS in: developing national and regional implementation plans to overcome both the barriers; implementing additional capacity building activities; and undertaking collaborative projects within the region and wider EU.
- Through the Forum, CEE MS and Industry should also be encouraged to take more of a substantive role (potentially through multi-national CEE cooperation) in activities such as Capability Technology Groups to discuss opportunities for European-wide R&T projects (in particular focusing on the European critical defence technologies) and to forge greater links with other EDA MS and Industry (including prime-contractors); as well as other collaboratively focused bodies such as the Organisation for Joint Armament Cooperation (OCCAR), as well as with western prime-contractors. In addition, the forthcoming EDA SME Special Advisor could also assist in championing opportunities for CEE MS and addressing shared problems such as increasing access to prime-contractor led supply chains.
- As such, the EDA should consider doing more to promote data sharing and knowledge transfer across all MS, for example by improving the ease of use of the Collaborative Database (CODABA). This platform has the potential to deliver greater levels of information sharing needed to develop effective cooperative projects, in particular identifying those opportunities for collaboration across CEE and wider EDTIB, be it to cooperate to sell, procure or to develop. The forum would be an effective instrument to disseminate these opportunities.

**Recommendation 2:** The EDA should provide support and advice to CEE MS on defence industrial policy

The EDA should consider taking a proactive lead in supporting CEE MS to develop a robust and effective defence industrial policy that will enable more efficient and effective engagement in collaborative international projects and increased participation of CEE MS in prime-contractor led supply chains. The EDA should develop an expertise-on-demand mechanism, which will be available, in country, to MS when requested. This mechanism could be based on EDA internal expertise, as well as external expertise, supported by, for example a framework contract. This mechanism will:

- Facilitate and independently advise on the practical requirements of defence industrial policy generation, utilising best practice and a tool kit of policy instruments,
- Provide guidance on defence industrial strategy and policy issues,
- Provide practical support to address legal, commercial or procurement issues as they arise,
- Provide support and training in the important differences between national projects and the establishment of cooperative projects.
- Facilitate access to the wider EDTIB and industrial representatives across Europe, including prime-contractor led supply chains.

The role could also facilitate greater awareness of the ways in which the EC Defence Directive can be used to facilitate cooperation across the EDTIB. This role could exist as a standalone function or equally fall within the remit of another workstream within the EDA, for example, through advice and guidance provided to SME.

**Recommendation 3:** The EDA should facilitate access to specific and tailored training to meet CEE MS needs; in addition CEE MS and NDIA should develop joint national and potentially regional skills strategies that fully exploit EU funding opportunities

The EDA should develop the EDA/European Security and Defence College's European Armaments Cooperation Course to include a number of modules specifically tailored to the needs of CEE countries or other MS, on policy generation, defence procurement, legal and commercial awareness including intellectual property issues and project management.

CEE MS and NDIA should work to develop a common national and potentially regional defence skills programme, with appropriate stakeholder representation and engagement. The EDA could provide an effective forum to facilitate CEE MS in developing and implementing a coordinated defence procurement skills strategy at both national and regional levels, perhaps expanding the remit of the CEE MOD/NDIA Forum. As part of these strategies the EDA, CEE MS and NDIA/Industry should all investigate the exploitation of available EU funding for skills development.

The EDA can lead the debate about how to improve the image of defence as a sector. By preparing bespoke information for the EDTIB and connecting CEE NDIA/Industry with the European Commission, the EDA can promote the need for EC funding for skills initiatives. The EDA could establish an advisory group drawn from university representatives, defence industry and human resource

specialists that could provide technical support to the delivery of key skills and competence for defence across the EDTIB, focusing initially on CEE MS.

**Recommendation 4:** A pilot collaboration project should be undertaken utilising the CEE MOD/NDIA Forum, and assistance from the EDA, to develop and procure equipment where identified synergies exist

CEE MOD and NDIA should undertake to exploit synergies in supply and demand to engage in a collaborative development programme, through the MOD & Industry Forum in conjunction with EDA support. This pilot project would not only provide a necessary military capability, which could also be exported to wider EU customers or third markets, but importantly would also provide an opportunity for CEE MOD and Industry to:

- Take the lead in delivering a collaborative programme, out with support provided by the EDA, a lead CEE nation or nations should be the contracting authority while learning the lessons of previous international collaborative programmes, e.g. JSF, Eurofighter, A400M.
- Develop and refine processes, policies and ways of working to deliver effective capability in a collaborative environment.
- Develop the experience, knowledge and skills to lead and collaborate as a group, including joint decision-making and project management, embedding an environment of cooperation between both MOD and industry.
- Develop through other learning methods in a relatively low risk environment. At our London workshop many participants from both CEE MOD and industry expressed an aversion to training courses and a preference for 'learning by doing'.
- Put into practice effective commercial and contractual structures to allow for effective industrial participation across the collaborating national framework, for example encouraging vertical integration of suppliers, which could provide the basis for further collaboration.
- Share technology, development and manufacturing techniques and innovation to develop cutting-edge capability attractive to export markets.
- Leverage economies of scale in procurement by maximising the number of participant MS.

Given the large number of potential participants (eight CEE MS) with a declared industrial capability in this area there is a good opportunity to reduce technical risks through collaboration and a relatively low financial contribution to the development phases should all eight member states contribute. Financial, project management and other non-industrial support needed to deliver such a project successfully could be provided by the other three CEE MS who have no declared industrial capability in this area. Of course this would be dependent on the systems and overall capability of the equipment, which could involve all CEE MS.

## Opportunities for further research

Building on the findings of this study, there are a number of opportunities for future research, including:

- Identifying detailed common requirements across CEE MODs,
- Investigating the policy measures needed to align planning phases and budgetary cycles across CEE MS, as a means of promoting common procurements,
- Examining barriers to defence industrial cooperation across other small EU MS to differentiate between issues specific to CEE MS and those affecting the European defence sector more widely.





