



FUTURE CAPABILITIES

Emerging Trends and Key Priorities



EMERGING TRENDS AND KEY PRIORITIES



Increased insecurity on Europe's borders combined with continued constraint on military budgets at home has refocused the debate about defence capabilities in Europe. As capability development is a long-term process, one vital question is "how will Europe retain and develop the capabilities needed to react to the threats that may arise in the coming decades?"

Since 2008, the European Defence Agency (EDA) has been producing a Capability Development Plan (CDP) to answer this question. It looks at future security scenarios and makes recommendations about the capabilities European militaries will need to react to different possible developments.

The CDP is a comprehensive planning method providing a picture of European military capabilities over time. It can be used by Member States' defence planners when identifying priorities and opportunities for cooperation. The European Defence Agency is coordinating this work done in close conjunction with Member States and other stakeholders such as the EU Military Committee. The CDP benefits from several inputs such as the Headline Goal Process, studies on long-term trends, lessons from operations and information on current plans and programs.

This brochure outlines the main features of the latest revision of the CDP, reflecting on current trends and proposing a list of priority actions (pg. 11)

Changing nature of threats

The global security situation has changed significantly since the first CDP was released in 2008. The strategic situation in the European Union (EU) and the wider world has evolved considerably, while the economic crisis has also had profound knock-on effects for European militaries. The changes of the last few years highlight the difficulty in accurately predicting what will happen even over a short period of time. The revised CDP recognises this and attempts to take into account the full range of possibilities that might occur by 2030, from a generally peaceful world to an aggressive environment that includes inter-state conflict.

To date, the capability requirements linked to the Common Security and Defence Policy (CSDP) have focused primarily on crisis management and deployable forces. This is still the case, with sixteen CSDP Missions and Operations ongoing across three continents. However, insecurity around Europe has begun to shift this focus: the question of territorial defence is back on the agenda.

The issue of territorial defence versus deployable forces is not black and white. Certainly, there are different focuses: in general, territorial defence favours heavier and less mobile weapons, while deployable forces call for lighter, agile, and more autonomous forces. These differences should, however, not be overstated: in modern warfare substantial mobility, agility, and autonomy is also required for territorial defence, in particular if one state is supporting another in a regional or alliance context. Consequently capabilities such as air or sea transport, air-to-air refuelling, and deployable logistics and medical resources remain essential for both territorial defence and deployable forces. One key recognition is that the financial situation in Member States will not permit the development of separate forces for territorial defence and crisis management operations.

The aim of the revised CDP is to support this by drawing a picture of European capabilities over time, which can be used by Member States' defence planning when identifying priorities and opportunities for cooperation. The mission of EDA is to support Member States' defence efforts wherever their focus lies, be it for national, EU, NATO, or UN missions, which are, after all, conducted by the same pool of forces. EDA works to address both short-term operational requirements as well as providing contingencies for possible future developments.

What will Europe's defence capabilities be used for in 2030?

The development of capabilities is a long term venture. Capabilities must be appropriate for a range of situations, some of which may not have been envisaged when the capability was first planned. Capabilities that may have been conceived during peace time, for relatively low-intensity use, may end up needing to be used in full-scale warfare. What is clear is that forces need to have the capacity to react to a wide range of possible scenarios.

The threats from adversaries are also likely to change considerably in the coming decades. Adversaries will seek to combine technology advanced and irregular methods of warfare, spanning all possible domains: land, sea, air, space, and cyber. The threat of attacks using chemical, biological, radiological, and nuclear materials also have to be taken into account. Attacks using economic, legal, diplomatic measures, or attempts to influence and subvert media and political systems will continue. Altogether the combination of a reduced quantity of European forces, an increasingly multi-faceted adversary, and the complex nature of future environments mean that capabilities will need to provide greater *flexibility, agility, and adaptability*.



New technologies and changing environments

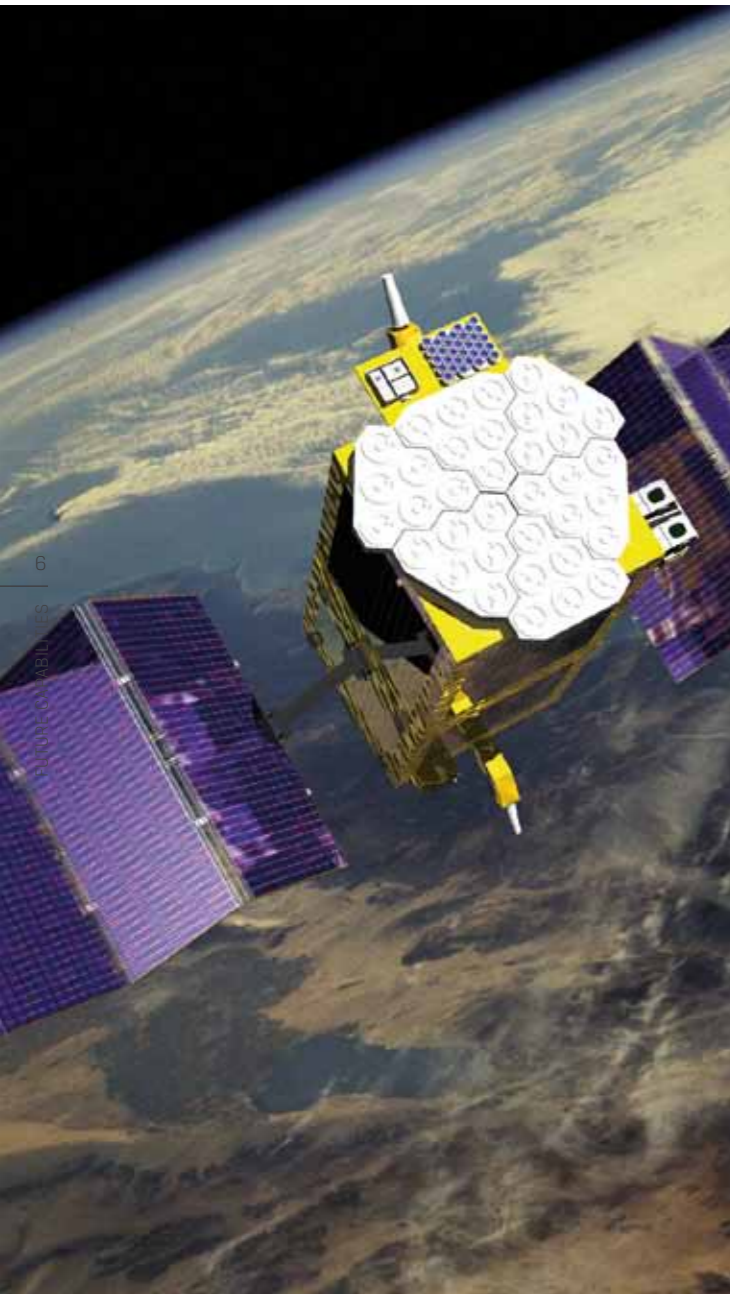
Various long-term trends are being driven by the development of new technologies. Unmanned capabilities will increasingly be used to complement the work of armed forces. Combat support to forces will be improved by technological advances, for example strikes beyond visual range, direct energy weapons, or laser technology, as well as new warfare tactics incorporating these. Non-lethal effects and scalability of effects (where the user can alter the explosive yield depending on the nature of the intended target) in future weapons systems are also likely to increase in importance.

Effective command

In the domain of *Command*, there is a need for redundancy and back-up for Command, Control, Communications, Computers, and Intelligence (C4I) systems as well as new approaches to tackle the increasing threat from cyber warfare, both for materiel and personnel.

To reap the full benefit of the EU's potential in crisis management, interoperability with civilian actors is a requirement for any command and control system. Coordination of activities with civilian actors should be further developed at all levels.

Managing media operations and consistency of message in various channels will be essential to win the "battle of the narrative". For this it has become critical to take into account the impact of social media.



Information management and situational awareness

Within *Inform*, information management and situational awareness will be increasingly important due to the large amounts of data which must be handled and correctly disseminated to the relevant people.

Redundancy, cryptography, as well as optimised use of air and space based communication systems will be key elements in future operations, which will also include cyber threats. Faced with growing uncertainty about adversaries and their capabilities, intelligence tasks and related capabilities will have even higher importance to ensure the best use of available weapons.

The use of remotely piloted air, maritime, and land systems will become standard, mainly due to their ability to complement situational awareness, albeit with a significant element of "man in-the-loop". Additional capabilities will be called for with regard to human intelligence and open source intelligence.

Engaging the adversary

In the range of *Engage*, the conduct of joint operations will be particularly important, especially in high intensity conflicts. Planning, training, and interoperability are key, as are targeting, battle damage assessment, and achieving scalable effects. The decision-making process needs to be quick and reliable. The importance of avoiding collateral damage will drive demand for precision weapons, including energy weapons.

The ability to engage the adversary globally will sustain the need for expeditionary warfare that leaves only a limited footprint in the area of operations. Special Forces have an important and increasing role in these increasingly complex battle space which do not have defined frontlines.

Protecting European forces

Protecting European forces from losses will continue to be given highest priority. Threats from weapons of mass destruction as well as chemical, biological, radiological and nuclear (CBRN) attacks will continuously and increasingly have to be addressed, in particular detection and early warning capabilities. Air and missile defence will face new challenges due to adversaries increasingly advanced systems.

Europe's technological advantage may be reduced in the mid-term depending on investment and progress made by Europe and by potential adversaries. The implications of these developments will not be limited to the military domain. Developing capabilities in the protect area requires strong civil-military cooperation because technical evolution, in areas such as cyber, sensors, material and energy, is driven by the civilian commercial sector as much as it is by militaries.

Deploying around the world

To *Deploy* European forces to areas of operation anywhere on the globe sets requirements for strategic projection of forces. Transport capabilities, both seaborne and airborne, are required continuously. Ensuring lines of communication and international waters for European trade and interests is a vital task to fulfill in this domain. Additionally, control of theatre access will come under increasing pressure from adversaries, thus agile and maneuverable forces supported by adapted and integrated surveillance systems are required. Alongside these efforts, deployable medical capabilities have been recognised as an area in which additional efforts are needed.



Sustaining our forces

In order to sustain Europe's forces for longer periods of time, increased coordination of logistic capabilities are needed. This area often acts as a bottle neck for Member States' participation in operations, in particular when it comes to those taking place in remote areas with limited host nation support. This was the case in recent operations in Democratic Republic of the Congo, Chad, Mali, and in the Horn of Africa.

Coordination at EU level would be beneficial, especially for small and mid-size Member States. Autonomous forces with reduced need for supply of energy will also be an important part of the solution. A general trend is the movement towards collaborative solutions to capability development, be it bilateral, regional or at EU level. With a growing number of operations being carried out in a multinational environment it is essential to ensure interoperability between different European forces. Modularity of capabilities will be an important tool to achieve this, which also will help attain higher degree of *affordability* of capabilities.

Cyber defence

Developments in cyber warfare mean that it needs to be taken into account in the development of virtually all forms of capability. This includes risk assessment as well as exploration of new possibilities for European forces. By its nature, the cyber domain is not limited to national borders or physical presence, a fact that calls for a European perspective and collaborative activities.



Flexible land forces

Although European and Western countries are generally less inclined to commit land forces outside of their territory, "boots on the grounds" will continue to be essential for controlling an area of operations and achieving the desired end result.

Land forces will need to be deployable and able to deal with a wide array of environments, situations, and threats. Non-state actors will continue to use hybrid warfare, including targeting of civilians. These actors might make use of the latest civilian technologies and any available weapons system.

The operational context for using land capabilities can range from low-end humanitarian or stabilisation operations through to high-intensity inter-state conflict. In order to deploy under these varying conditions, forces will need to have a large degree of flexibility and have the ability to adapt to an evolving situation on the ground during an operation.

When conducting operations in a complex multi-national and multi-cultural environment, the importance of the human factor cannot be overstated. Individual soldiers will need to display high-level analytical and communication skills to deal

with increasingly complex situations on the ground. This necessitates increased pre-deployment training.

It seems likely that in the future potential adversaries will have the means to threaten the access to the area of operations and intra theatre movement. To address this, capabilities for protection and manoeuvre, including helicopters, will be of increasing importance. Adversaries will be both conventional and unconventional, setting high standards with regard to situational awareness and related capabilities from senior command to individual soldiers' level.

Increasingly, drones will play an integral role for land forces as will measures within the cyber defence domain. Fire power in a joint context will be improved by better situational awareness, in particular with regard to precision engagement, which will help to minimise collateral damage.

Protection of forces and soldier equipment will continue to be an essential part of land forces' development. Political support for operations is sensitive to casualties and all efforts must be made to keep these at a minimum.

European land forces will face future requirements from two main drivers: the need for deployable forces for crisis management operations and the requirements for security at home via territorial defence. Modular solutions from the very beginning of a project will become the rule in order to allow future land forces to cope with different and evolving mission types. It is of great importance that the land forces are developed in a way that enables them to execute a wide variety of tasks both in the context of territorial defence and expeditionary warfare.



Controlling the seas: maritime forces

There is an increased need for European naval presence worldwide to protect sea lines of communication and vital trade flows. The experiences of European maritime operations, in particular the anti-piracy operation off the coast of Africa (Operation Atalanta), have highlighted this. Being able to operate far from home, for long periods in open sea has shown the importance of **endurance** at sea and having available European forces. Ships need to be ocean-going and manning systems need to be adapted for extended operations. Readiness and maintenance periods need to be coordinated to ensure **availability** at a European level. This is particularly important for key assets such as aircraft carriers, submarines, amphibious ships, and maritime patrol aircraft.

Maritime operations conducted so far have underlined the need for interaction between military and civilian actors in order to explore the full potential of a comprehensive approach. This sets the requirements for exchange of information and related communication systems. **Interoperability** between navies and between military and civilian actors such as coast guards, police authorities, and other civilian authorities ashore, will be increasingly important.

The role of navies in providing combat support to land forces will continue to be of great importance for the EU to conduct crisis management operations. Improved situational awareness, better communication, and remotely piloted devices will enhance efficiency of this combat support.

With the emergence of new naval powers, the capability of sea denial remains essential in power projection. The role of the submarines is of key importance in this respect. Europe still has a technological edge in underwater capabilities which is important to safeguard.

One thing that is clear about European navies is that its fleets are ageing. Around 80% of the resources for sea control, frigates and corvettes, are older than 15 years. Taking into account that the expected lifespan of these resources is around 25 years, there is a formidable task to renew these fleets. In this context the issue of **affordability** must be addressed. One avenue to pursue is to establish a balanced combination of high-end resources, current destroyers and frigates, and low-end resources, patrol vessels, coast guard ships etc. European navies will still need the high end resources to ensure vital interests and contribute to **deterrence**, but in many cases less expensive capabilities can provide cost effective but efficient capability solutions.





CDP PRIORITY ACTIONS

Based on the identified trends, information gathered from Member States and the European Union Military Staff (EUMS), capability shortfall assessments, and pooling and sharing opportunities, a set of priority actions were selected by Member States. These can be undertaken either inside or outside the EDA framework. This list of priorities is intended to be detailed enough to direct the work needed to make progress on capability development. In comparison with the priorities identified in 2011 there is a renewed focus on high-end warfare, including a larger maritime dimension.

Marshaling the skies: air forces

Air power remains a prerequisite in any multinational operation. Denial of adversaries' use of the airspace is key to ensure land forces' movement and action, and thus the success of the operation. Control of the air cannot be taken for granted in spite of experiences in Libya, Afghanistan, and the Balkans where coalition air power confronted poorly organised and ill-equipped adversaries.

The proliferation of advanced air defence systems is a fact, including surface-to-air missiles. One result of this is that non-state actors "are" also beginning to have access to these capabilities. The continued superiority of European fighter aircraft will lead to a growing use of advanced ground based integrated air defence systems by adversaries. The character of air interdiction will remain but will integrate RPAS/UCAVs and cruise missiles, enabling long endurance air operations in more demanding environment. European capabilities to suppress enemy air defence is regularly recognised as a shortfall that is only compensated for through US involvement. This will remain a challenging area to address both through kinetic strike and electronic warfare methods.

Challenges for air power

The need for air power to contribute to surface operations will require concentration of fire, greater all-weather capacity, precision, range and rapidity with regard to the sensor-to-shooter cycle. Helicopters will continue to play a key role in this regard. Air power is becoming more dependent on intelligence, surveillance, target acquisition, and reconnaissance (ISTAR)

capabilities and related management of information. In this regard there will be an increased use of drones as well as manned and space based assets, which together will help provide better situational awareness. Additionally, improvement of air strike precision and proportional kinetic air strikes will reduce collateral damage.

Air-to-air refuelling (AAR) will continue to be challenging at the European level. Today's limited and fragmented European capabilities will call for investment in new capabilities as well as substantial collaborative efforts, such as the pooling and sharing of existing capabilities. The delivery of the Airbus A400M and multi role tanker transport (MRTT) aircraft in the coming years will improve European air power projection in this regard.

Strategic air transport will continue to be key for the deployment of forces, especially when working under a tight time frame. The delivery of the A400M will have a positive effect in this respect as well.

In order to achieve credible operational efficiency, air capabilities require consistent capability packages, which are financially demanding for individual Member States. A balance of high end capabilities and less advanced capabilities is to be anticipated in some countries. Nevertheless, ensuring European air capabilities retain the highest technological edge is a prerequisite for interoperability with advanced partners such as the U.S.A. Achieving this will require a coordinated and collaborative European effort.

Gaining information superiority



- Counter Cyber Threats (Cyber Defence)
- Provide SATCOM Capabilities
- Enhance Battlespace Information and Communication Services
- Remotely Piloted Aircraft providing Surveillance (RPAS)

Enabling Expeditionary Operations



- Inter-Theatre Air Capabilities
- Intra-Theatre Combat Capabilities
- Enhance Logistic Support for Deployed Forces
- Provide Medical Support to Operations

Protection of Forces in Theatre



- Enhance C- IED and CBRNe Capabilities in Operations
- Provide Air and Missile Defence for deployable forces

Securing Sea lines of Communication



- Maritime Patrolling and Escorting
- Naval Surveillance systems

Crosscutting Drivers

- Energy and Environmental Protection
- SESAR

- Modeling, Simulation and Experimentation
- Space based information service



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