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Future Land Systems

Executive Summary

A strong and competitive European Defence Technological and Industrial Base (EDTIB) is one of the key resources to preserve and develop European Military Capabilities from now and in the upcoming 30 years. Land operations are, and will always be, a major part of all military activities.

This is the executive summary of “Roadmap and Implementation Plan for the Key Industrial Capabilities on Future Land Systems (FLS)”.

It is obvious that a number of actions must be taken care of, if the European Defence Technological and Industrial Base should be able to provide requested capabilities from mid to long term. However, the main part of proposed measures must be initiated immediately.

These measures includes provision of technologies intended for the Land Domain, better balanced funding, better synchronisation of programs, improved competencies building and identified important program areas for demonstrators.

Necessary activities are jointly owned by Governments, European Land Forces, Material Administrations, Academia and relevant Industry, although coordination is expected to be performed at top European level.

The European Land Defence Industry Sector broad view

The overall turnover of the European land Defence Industry is 17 billion Euros and it employs about 128,000 people. The Land Defence sector produces a whole range of products needed by European armies, thanks to a range of high level controlled technologies and know-how. Land sector industrial activity is mainly supported by the domestic market enabling 6 billion Euros of exports outside the European Union

Meeting a changing future Land Environment

The land environment is multifaceted and demanding due to the hybrid nature of the threats and the mosaic of concurrent military activities that might have to be conducted

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in all levels of conflicts. It is obvious that air and naval military activities also will be a part of joint operations even in the future, thereby continue to create complex interfaces between functions and units. Therefore, specific attention must be made regarding adaptability and agility, collaboration and cooperation, interoperability and standardisation, concepts and doctrine, Supply Chain Management, designing for export and sustaining existing capabilities.

A transformed European and Global Defence Market

The main part of the EDTIB has been built up before and during the Cold War. Existing capabilities are therefore primarily designed to meet national requirements. However, the defence transformation that started after the Cold War era has created more diversified capability needs and thereby causing major impact on the EDTIB. Current financial crises have also led to defence budget cuts and the on-going international operations have made European nations to be more short-sighted than before.

Europe has a long history of successful capability developments in the defence area and is producing state-of-the-art solutions in several areas. The EDTIB has acceptable skills and capacity to provide EU with required military capabilities in near term and midterm.

In order to ensure the future military needs EDTIB will likely require an increased level of competence. There are several areas which have to be carefully handled due to current budget constraints and identified future requirements.

Together the European member states represent the largest economy in the world and would be able to efficiently use its existing resources if necessary cooperation and coordination can be achieved. This will require European mitigation plans, harmonisation of requirements, common standards and sharing of governmental resources.

The traditional defence industry is facing competition both inside and outside EU, especially from US and from economies in East Asia. Some of these non-European competitors are considered to have well developed capabilities and skills. In addition they can compete with lower price by taking advantage of lower cost levels for manufacturing. Their solutions could be less advanced but still fulfil national requirements that are designed to allow tenders from all potential suppliers.

New economies are also considered to be new markets for European defence producers which assumes ultimately benefit the European Union and create reduced life cycle costs for defence equipment. This will likely require adjustment of European solutions to other types of capability needs or less advanced requirements.

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Technology as a driver for future capability

Land Systems consist of numerous of different technologies. These technologies unite military capabilities with the industrial base.

The development of technologies will cause changes in tomorrow’s scenario and create new military capability needs. New technologies can be of advantage but might also create future threats from opponents and non-European competitors. Moreover, experiences from today’s operations have clearly shown that currently used equipment often have to be modified to meet the existing threat situation due to technologies that have tactical inadequacies or have become obsolete.

Therefore, new processes for identification and prioritisation of promising new technologies must be implemented in addition to shorter turnaround time of cycles for putting promising research results into practice and in combination with new and commonly accepted qualification and certification procedures.

The FLS report has categorized more than 300 technologies according to their maturity level and the possibility of implementation. Different groups of technologies with transversal impact on several capabilities and existing legacy have been selected and prioritised.

Although specific civil technological developments could be used for military advantages, a number of technology areas have pure military applications and are essential for European Land Forces to become successful on the future battlefield.

The investment in future defence technologies should consider a long term perspective, though some activities must start immediately to achieve effects on midterm and long term. When investing in research and technologies, the complete sequence from basic research up to development has to be analysed and spending must be concentrated to maturity levels where greatest effects could be achieved.

To maintain critical capabilities

National customers are shifting towards more reuse of existing systems and, when investing in new systems, preferably buy of the shelf in smaller quantities. This means that there are fewer new development programs and limited funding for innovations, demonstrators, and other activities to bring technologies to operational solutions. Europe risks not being in the forefront of development and loose operational advantages against future adversaries.

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The most critical industry to preserve and develop is considered to be the suppliers of pure military systems with no level of dual use (e.g. weapons and ammunition industry). It is also of key importance to sustain and develop the supply chain in areas with dependency issues which could risk the security of supply. Increased flexibility to deliver over time or directly on demand must be developed. This must be maintained for the long term.

It is essential to sustain the highly skilled European workforce to enable the nations to develop effective measures against tomorrow’s threats. Continuously running programs is a prerequisite to maintain competence levels and the ability to manufacture and deliver military capabilities when needed.

The increasing age problem in the land defence sector and the lack of substantial education for employees, working with pure defence related technology, must be mitigated. Extended cooperation between industries and universities in the area of research and education would be an opportunity in addition to increased investments. This should primarily be done by utilising existing infrastructure.

To prioritise shrinking budgets and coordinate Programs

Available funding is today concentrated on short term issues rather than long term strategies. The level of spending on operational costs compared to spending on capability development is currently unbalanced. Spending on urgent operational needs create gaps in future budgets and large inventories of equipment with unique requirement profiles.

Insufficient funding in prioritized areas will result in long endured programmes. As a consequence program risks as well as total life cycle costs will naturally increase. In addition the final solution may not be able to meet military demands when actually delivered. New methods to decrease costs and to shorten turnaround time must be implemented.

Traditionally and from a national perspective, security of supply has been maintained by starting national programs. This has resulted in several duplications within the European military land domain. Taking into account decreased budgets, long lead times and increased costs it is recommended to strengthen the European coordination within a number of land domains. The report describes some of the areas where this would be beneficial.

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The risk of dependencies and impact of Pooling and Sharing

The study has identified different areas there dependencies could occur. Traditionally this issue has been connected to raw materials, component supply and export rules. Over mid and long term the most critical areas might change from time to time. Dependencies will also appear as a result of intra-European industry restructuring or as a result of sub suppliers leaving the business.

Pooling and Sharing of capabilities might reduce costs on short term but the long term effects on security of supply must be monitored to mitigate the risk of losing critical capabilities to deliver on demand. The long term consequences of Pooling and Sharing from an industry perspective need further analysis.

The proposed route forward

The Future Land System Study report defines a prioritised roadmap for the upcoming 30 years. The roadmap includes measures to provide necessary technologies, balanced and prioritised funding, synchronisation of programs at European level and improved competence assurance. The report describes needed level of effort connected to a time line.

Seven important program areas for Future Land systems are identified. This includes unmanned systems, soldier systems, missiles, munitions and EU battle group issues.

Eleven recommendations are identified, which requires immediate actions. These actions have to be implemented in parallel, and in some areas, repeatedly updated on mid and long term to maintain the status. Identified transversal technologies will need to be adapted to relevant sectors within the Future Land System.

Finally thirteen proposals for studies and projects are suggested. The proposals cover areas related to the recommendations and identified programs.

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The Future Land Systems study’s eleven recommendations

- 1) To coordinate and harmonise European Defence Technology export and import regulations.
- 2) To strengthen the EDA role as the coordinator for the Land System Sector.
- 3) To implement interoperability standards (including methods for simulation training and encryption, protocols, open architectures, etc).
- 4) To invest in proposed future defence technologies.
- 5) To perform studies and projects in the areas of new methods for funding, methods for harmonisation, qualification procedures, rationalisation of test & evaluation centres, cross recognition of certification, outsourcing of maintenance and logistics and new business models.
- 6) To establish new education opportunities for the defence industry workforce.
- 7) To study the effects of Pooling and Sharing on the industrial supply chain.
- 8) To perform studies and projects in the area of new Power Sources for land assets.
- 9) To perform studies and projects to improve War Gaming and Combat Simulations methods.
- 10) To perform studies and projects regarding Protection materials.
- 11) To perform studies and projects in the area of Electronics (including FPGA).