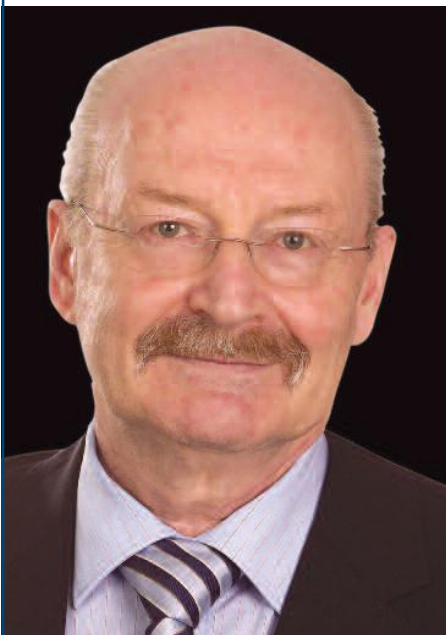


"The only way for Europe to preserve its strategic autonomy is to pull its resources together"

We spoke with *Prof. Klaus Thoma* and *Frédéric Mauro*, co-authors of the 'Future of EU Defence Research' study commissioned by the European Parliament and presented in March 2016, about the link between civil (security-related) and defence research, Europe's current status in global defence R&T as well as the outlook for the EU's strategic autonomy



"I don't see Europe being a leader in any defence technology sector. This is due to a fatal lack of investment for decades and our report clearly demonstrates it"

Prof. Dr. Klaus Thoma

Where do you draw the line between security and defence research?

Mr Mauro: The difference lies in the capabilities you seek to produce. The objective of defence research is to produce 'weapons' i.e. all sorts of devices and tools allowing military effects such as destroying or neutralizing enemies. As we have demonstrated in our report, defence research does not occur in a vacuum. It is the result of a defence planning process, the goal of which is to define what the capabilities needed are, in order to satisfy the level of ambition. Another important point is that defence research is aimed at giving a decisive operational advantage to the forces and thus concentrates on disruptive technologies, which is not always the case in security research.

That said, this distinction has limits. At low technological readiness levels (TRL), let's say from levels 1 to 3, there is no difference between defence research and security research, nor between those two and civilian research. It is all fundamental Science & Technology. Thus investing at those levels is as good for the prosperity of the European industry in general as for defence's sake. At somewhat upper TLRs' (3 to 5), although defence research is mainly 'capability driven', defence planners must scrutinize the solutions that civilian technologies could bring at a better value for money rather than systematically

pursue separate channels. Indeed, there is a new nexus between civilian and defence research which clearly gives the lead to the former and this is an important point to bear in mind.

So, does it still make sense to differentiate between security and defence research, and if so, is it different at national and at European level?

Prof. Thoma: It does when one speaks about technological studies linked to major equipment programmes from submarines to main battle tanks (MBT) and combat aircraft. In addition, a lot of technologies can be used only for defence purposes like missiles, precision-guided munitions, stealth technologies... R&D in the whole area of so-called 'complex weapons systems' hardly overlaps with non-defence R&D. That kind of R&D is essential for us to keep our 'freedom of action'.

This is why we need a robust and capable supply chain of energetic materials (explosives, propellants), research labs and production plants within Europe. In the same way, MBT need sophisticated kinetic energy (KE)-Rods for their guns, produced in specific metallurgical production lines. Unmanned Combat Air Systems (UCAS) need cutting edge stealth technologies.

On the other hand, a wealth of

technologies is 'dual use' and can satisfy more than one goal. Let us think about advanced computing, smart factories, photonics and robotics, 3-D printing and design, cyber, advanced electronics, biomedical, energy & power, materials, autonomy and sensors... All those technological building blocks have been identified for long as 'key enabling technologies' at a European level and they need to be developed at that level.

Indeed, no single European country can stand alone in the technological race. Let us just remember, with regard to defence research that under the 'Third Offset Initiative' the US plans to spend €64 billion on R&D in 2017. China's yearly defence R&D is estimated at more than €20 billion. In comparison, the participating Member States of the EDA spend all together only €7.5 billion per year.

The European country which spends the most on defence R&D, France, only spends a little bit more than €3 billion per year, including on nuclear.

In which technology domains of relevance to defence including commercial innovation do you see Europe globally as either a 'co-leader' or a 'smart-follower', or rather in a 'perilous position'?

Prof. Thoma: I don't see Europe being a leader in any defence technology sector. This is due to a fatal lack of investment for decades and our report clearly demonstrates it.

Europe is sometimes what we could call a 'smart follower', and even occasionally a pioneer with regard to space. This is true for launchers, as well as satellites and some space missions. Ariane, Galileo, Copernicus, Rosetta, exoMars are names that Europeans can be proud of and that would not exist without the Union.

Europe is in a perilous situation in many industrial sectors critical for defence such as robotics, artificial intelligence, swarm weapons, embarked lasers, drones, optronics etc. All of those technologies, which are disruptive today, will be generic in ten years' time. If we do not plant the seeds today, we will not pick the fruit tomorrow. Let's come back to the UCAS: the first flight of the Boeing X-45 occurred in 2002. Its European competitors are ten years late, but at least they are there, thanks to the efforts made in the 1990s and at the beginning of the 2000s. If we carry on reducing defence budgets, in ten

years' time, we will not have ten years' delay. We will simply not be there. 'Strategic autonomy' will be an empty word.

Precisely, how to ensure strategic autonomy and adequate coverage of military capabilities needs in a context in which innovation cycles are driven by industry 4.0 and getting ever faster?

Mr Mauro: First and foremost, the only way for European countries to preserve or to restore their strategic autonomy is to pull their resources together. This can be done most efficiently through the European Union budget. There is no alternative. Lonely roads lead nowhere.

Second point, military capabilities needs do not come out of the blue. They must be derived from the Global Strategy that is poised to be presented by the High Representative by June. The EU must build the missing link between this Global Strategy and a renewed Capability Development Plan in order to answer the question: what is the EU's level of ambition? What does it want to be able to achieve militarily? This supposes that a 'defence sub-strategy' or a 'white book' or a 'white paper' - call it what you want - should be derived from the Global Strategy

Last but not least, how to take into account the increasingly important technological push due to faster innovation cycles? There it is where the European Defence Agency has a crucial role to play. It must be a centre of excellence capable of doing for the Member States something they are not capable to do at home. The EDA must weave the fabric of the new strategic programmes with the yarn of the capability needs and the weft of the technological push. This supposes that the



"The EU must build the missing link between this Global Strategy and a renewed Capability Development Plan in order to answer the question: what is the EU's level of ambition? What does it want to be able to achieve militarily? "

Frédéric Mauro

participating Members abandon the de facto rule under which the EDA has been functioning and also that they accept a substantial increase of its budget. If they are not willing to do so, then the Union should consider other solutions like the creation of an ad hoc Joint Understanding/Joint Technological Initiative or the creation of a Defence Research General Directorate under the authority of a European commissioner. The choice is for the Member States to make. ❏

Prof. Dr. Klaus Thoma is an independent expert who, by means of his outstanding achievements, has played a major role in the German defence and security research over more than 30 years. For 18 years he was the Director of the Fraunhofer Ernst-Mach-Institut in Freiburg and acted as Honorary Professor at the University of the German Armed Forces in Munich and at the Technical University Dresden. Since his retirement in 2015, he works as scientific advisor in the area of defence and security.

Frédéric Mauro is a lawyer at the bars of Paris and Brussels specialised in dealing with complex advocacy relating to defence and the operations, legal matters and costs relating to it. He is a former French civil servant and has a strong understanding of French policy in this area.

Prof. Thoma and Mr Mauro are the co-authors of the 'Future of EU Defence Research' report published at the request of the European Parliament in March 2016.

[www.europarl.europa.eu/RegData/etudes/STUD/2016/535003/EXPO_STU\(2016\)535003_EN.pdf](http://www.europarl.europa.eu/RegData/etudes/STUD/2016/535003/EXPO_STU(2016)535003_EN.pdf)

