

# EDA CapTech Radio Frequency Sensors Technologies SRA



The European Defence Agency (EDA) RF Sensors Technologies recently updated its Strategic Research Agenda (SRA) to align it with the Overarching Strategic Research Agenda (OSRA) methodology developed by the Agency. The technology gaps identified within the area of RF sensors technologies have been summarized in nine Technology Building Blocks (TBBs). Roadmaps with project ideas have been defined for each TBB, which will be used to guide research and technology activities in the CapTech during the coming years.

## Mission and objectives

The mission of the CapTech RF Sensors Technologies (Radar) deals with **Radar and Electronic Warfare (EW) systems** applying **RF, magnetic and electronic technologies**. It includes the related subjects of signal processing, propagation and signature control and reduction. The objective of the CapTech is to generate collaborative RF Sensors projects from a system level perspective by facilitating meetings and dialogues of governmental representatives with research and industry experts. It also supports participating Member States (pMS) in preparing wider programs and common initiatives.

The CapTech activities are guided by a shared vision of available and emerging technologies developed by CapTech experts from government and non-government organisations, industry and academia. This vision is developed from state of the art analyses, identification of technology gaps and how these relate to current and future military needs.

The work of CapTech Radar is generally in the range of starting Technology Readiness Levels (TRL) i.e. 2 to 4. However, the ambition for the TRL could go up to TRL 6/7 in specific cases. These two readiness level windows are necessary in order to close short term (5 – 10 years) and longer term (more than 10 years) technology gaps. A further CapTech objective is to create added value to European defence R&T by

providing a forum and a meeting point for specialists from all over Europe for the generation of R&T collaborative projects in the Radio Frequency Sensors domain.

## SRA update process

Based on future military needs expressed through the **Generic Military Task List (GMTL)** and the **EDA Capability Development Plan (CDP)**, as well as a state of the art (SoA) analysis of the area of materials and structures, a set of high priority **Technology Gaps (TGs)** were identified. RF and Sensors are generic definitions and relate to many diverse applications which are essential for all branches of Member States' Armed Forces. The TGs have been identified and clustered by **three main CDP priorities**: Information Superiority, Air Superiority and Cross-domain capabilities contributing to achieve EU's Level of Ambition. The cross-domain includes emerging and innovative technologies relevant for more than one branch of the Armed Forces. Also, a second set has been identified for which the CapTech Radar should play a major role: Space-based Information and Communication services, Ground Combat Capabilities, Naval Manoeuvrability and Underwater Control contributing to resilience at sea.

The updated SRA has implemented the new OSRA methodology for the first time. As part of this, nine **Technology Building Blocks (TBBs)** have been established for the CapTech, clustering technologies and linking the TBBs to the TGs with a constant focus on military capability needs. The TBBs have been also divided into several sub-topics, each referring to different aspects of the TBB, including the rationale, military relevance, expected effects, relevant technologies, ambition level, timeframe, synergies and dependencies between TBBs and CapTechs, and the scope. A list of literature references and relevant activities in the EU, NATO and DARPA was also added.

The TBBs have been declined in several potential project ideas (projectisation), taking into account the outcomes of two workshops involving Industries, Academia / RTOs and CNCs. The project ideas have been categorized by their timeframe (short-, mid- and long-term), plus a draft funding, and their link with CDP and GMTL priorities.

Also, the rationale in this edition of the SRA is to support synergies between different CapTechs where several technology fields overlap in order to highlight interdisciplinarity among several defense areas.

### State of the Art analysis

A State of the Art (SoA) analysis was performed from the former 11 Technical Building Block (TBB) definitions (SRA v1.5 – 2016), considering both civilian and military applications, technology trends and innovations, and following CDP recommendations. This process has led to a large collection of information, structured according to updated and new TBB scopes as defined hereafter:

### Technology Building Blocks (TBBs)

The following Technology Building Blocks have been defined for CapTech Radar:

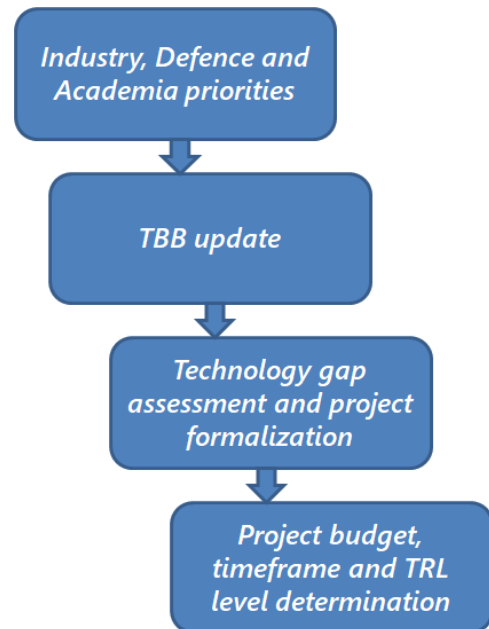
- TBB01: Detection, tracking and identification of challenging targets
- TBB02: Advanced Front/Back End
- TBB03: Electronic Warfare
- TBB04: Multi-platform RF Systems
- TBB05: Cognitive Radars
- TBB06: Scalable Multi-function RF Systems (SMRF)
- TBB07: Specific Radar Application
- TBB08: Disruptive Concepts
- TBB09: Common EU Benchmarks for Validation, Verification and Standardization Disruptive Concepts

### Way forward through “Projectisation”

RF sensors are essential for all branches of the Armed Forces, and similar technologies may be applied in many different platforms. To evaluate and prioritise technologies with such a wide range of diverse applications, the SRA Project Team developed the projectisation methodology to identify, sort and prioritise the TBBs, both at domain level and for the whole CapTech.

The main idea behind this procedure was to directly ask principal stakeholders (Industry, RTOs and

Academia) what were, in their opinion, the technologies in which to invest most in the nearest term and which were the potential ground-breaking concepts for the long term to be worth researched on in order to contribute to European defence superiority, through two workshops. On this basis, the SRA team could provide an updated TBBs map with ideas and concepts of relevant projects, prioritized by their timeframe and initial budget. Also, the prioritization was defined in a sense that the most relevant technological gaps were to be closed in the shortest possible timeframe reaching, where possible, industrially relevant TRL. More conceptual but potentially disrupting aspects have been reserved for the long term, often from the lowest possible TRL level. For each proposed project a starting and ending TRL was proposed. The figure shows the process.



### Way ahead

Version 2.0 of the updated CapTech Radar SRA has been reviewed by the members of the CapTech Radar and reflects the state of the project proposals and project ideas as of July 2019. It is the intention to update the SRA of the CapTech Radar on an annual basis to reflect changes in project proposals and incorporate new project ideas in the TBB roadmaps.

*Latest update: 12 July 2019*