EUROPEAN DEFENCE AGENCY

Fact sheet

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# Second Joint Investment Programme on Innovative Concepts and Emerging Technologies (ICET 2)

**The second Joint Investment Programme on Innovative Concepts and Emerging Technologies (ICET 2) aims at fostering the development of new, innovative technologies that have great potential for future military development.**

## EDA's approach to European R&T

Pooling & Sharing is not only about quick wins. It will require long-term commitment if Europe is to retain, develop and maximise its capabilities. The capabilities of tomorrow will require investment today. Investment in defence Research & Technology is a key enabler.

Despite the current severe financial constraints, EDA encourages Member States to cooperate, notably in the field of R&T, where return on investment is widely recognized.

The overall reduction in investment in defence R&T could have serious implications, including for the technological and industrial base in Europe. This, in turn, could affect Europe's ability to develop future capabilities. EDA is therefore investigating proposals to stimulate collaborative R&T efforts, notably in the field of technology demonstrators.

Defence R&T, particularly in cutting-edge technologies, has broader implications for innovation, growth, industrial competitiveness and jobs across Europe. Synergies and best use of existing resources at European level need to be developed.

EDA has explored with the European Commission technology-bridging with the security research of FP7 to make best use of resources. This should be extended to and intensified in other civil research and innovation activities in the coming Horizon 2020.

## ICET background

Following up on the 1st EDA R&T Joint Investment Programme (JIP) on Force Protection, European governments agreed, in 2008, to establish a second Joint Investment Programme (JIP) for research into emerging technologies which might have a disruptive effect on the battlefield. Eleven European countries contribute to the initiative, which was funded by a common budget of €15.58 million.

The first JIP on Innovative Concepts and Emerging Technologies (ICET) looked into technologies such as nano-materials and structures, remote detection and health monitoring.

The contracts launched under the Joint Investment Programme on Innovative Concepts and Emerging Technologies are now about to be all completed. They can be considered very successful, since the participating nations have benefited from a good mix of innovation, competition, and on top of that, an excellent return on investment.

The contributing Member States have acknowledged that the JIP-ICET projects (which address 3 technology clusters: "Improved Autonomy", "New Solutions for Materials and Structures", and "Data Capture and Exploitation") have been implemented successfully.

Consortia of defence companies and SMEs, research centres and academia have provided innovative solutions and new ideas that are leading to several follow-on Category B projects. EDA accordingly proposes the establishment of a second programme of the same type, in order benefit from its forerunner and address new technical areas.

## The 2nd Joint Investment Project on Innovative Concepts and Emerging Technologies

Four years after ICET start, The European Defence Agency launched a new cooperative research programme, aimed at fostering the development of new, innovative technologies that have great potential for military capability development. As Joint Investment Programme, the work is expected to lead to technological breakthroughs that will contribute to the achievement of future military capability requirements and improve the competitiveness of European defence industry. EDA JIPs are open to all Member States and countries with an administrative arrangement with EDA.

The technical content of the planned projects cover three areas, namely Environment and human factors, Materials, and Signal processing and Simulation. All technology goals within these wider areas have high potential to lead to further, more focused developments, as in the first programme.

Following the Steering Board decision to launch the programme in June 2012, a programme arrangement detailing administrative issues has been drafted and signed by 8 nations in January 2013. The Participating nations are: Austria, Germany, France, Italy, Luxembourg, the Netherlands, Poland and Sweden.

The budget for the ICET 2 programme is 5.2 M€.

One call for proposals will be issued in March and will run until the summer. Defence companies and SMEs, research centres and academia from the abovementioned Nations are invited to express their interest in the JIP ICET2 to their respective MoDs, which will elaborate a list of potential contractors.

## ICET 2 topics

The technical scope of the proposed R&T programme is defined through eight R&T Goals which have been identified, sorted out and defined through a series of workshops in which pMS experts actively participated.

**1: AI driven systems for Data & Information Fusion**

The new developments of the Data and information fusion, based on recent advances in Artificial Intelligence (AI) should be used in different military context: early alert process (sensors/sources from land, sea, air and space data), decision support centres for on-time or planning executions (threats evaluations, sensor management, action/response means assignment), target localization, monitoring and classification, intelligence centres and communication systems. For non-military applications, e.g. financial sector requirements, new techniques have been developed that must be assessed for value to military applications.

**2: New Human & Systems concepts for cooperative working**

In human and social sciences, under the heading of information design, psycho-physiology, neuro-ergonomics, informatics, socio-ergonomics… knowledge is developed that could be used or merged with existing trends for the emergence of new approaches to interactions between humans and systems, and for increased human and system efficiency in military domain. We expect to most gains in the area of information systems and networked organisations.

**3: Energy Storage Technologies**

Energy Storage Technologies have strong impact on size, weight and power of the military system: vehicle silent watch applications, soldier portable power applications, more or all electric ship, submarine AIP (Air Independent Propulsion), UUV autonomy, UAV power sources, APU (Auxiliary Power Unit), directed energy weapons power sources. The most promising known new technique is the hydrogen storage technology (particularly for fuel cells).

**4: Criminology – bioterrorism threat applications – Forensic microbiology**

As Defence and Security tasks overlap more and more, traditional forensic expertise becomes defence relevant and the defence technology base must contribute to forensic needs. Significant technological development is required including an increased capacity to produce, manage and interpret large amounts of genetic information from traces of environmental genetic material; information management systems and software adapted to forensic microbiology; high quality low cost whole genome sequencing of large collections of dangerous pathogens; improving the bio-security and bio-safety of strain collections of the most dangerous pathogens.

**5: Energy harvesting for soldier systems & sensor networks**

The use of energy harvesting technologies in military environments will require technologies and integration processes different from those used in civil applications. In particular operating requirements including temperature range, reliability, ruggedization and shelf lifetime are different. Therefore a dedicated activity aimed at fulfilling military needs is motivated.

**6: Active Controls for Flow and Mixture of Gases**

Integration of active controls for flow and mixture of gases in the aircrafts, missiles and UCAV for stealth applications: drag and signature reduction, lift increase, manoeuvrability performance improvements for military aircraft engines, noise reduction

**7: Space Environment**

The knowledge of the outer space and the impact of radiation there on materials and systems is a key point for the understanding of atmospheric processes, in relation with both:

- the survey and monitoring of the atmosphere and
- the likely error sources that will impinge on data transmission and even on the data themselves (errors in interpretation and modelling, unreliable systems, partial or complete failure). This knowledge is of utmost importance for the development of monitoring and protection protocols to prevent perturbations, even "black-out", in sensitive data acquisition and transmission and for military satellites safety.

**8: Verification and validation of mixed analogue/digital distributed systems**

Military applications are often characterized by wireless links connections and by many sensors associated of many interfaces. These systems cannot be validated formally by current techniques. For the validation of mixed analogue/digital distributed systems, and even for relevant verification, new techniques must be developed. This study will indicate the most promising direction.