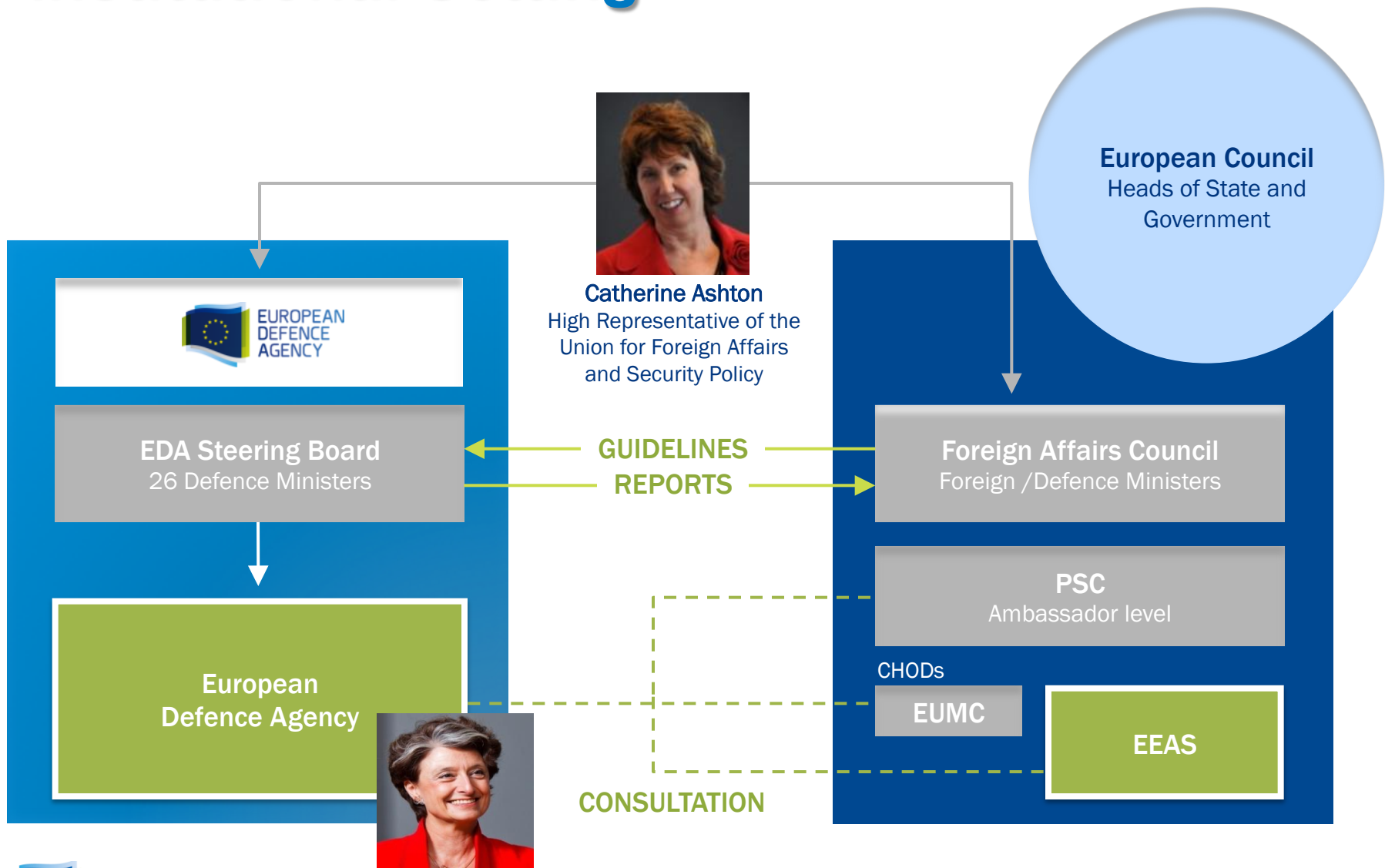




EDA CapTech IAP1 presentation to ESA ESCCON 2013

Institutional Setting



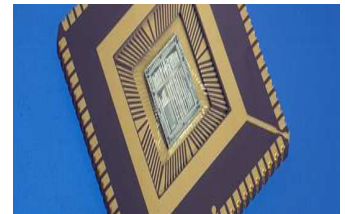
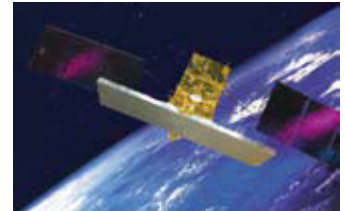
Claude-France Arnould
EDA Chief Executive

EDA Mission:

The European Defence Agency supports the Council and the Member States in their effort to improve the EU's defence capabilities in the field of crisis management and to sustain the CSDP as it stands now and develops in the future

Council Joint Action

- EU Agency located in Brussels
- Under the Council's Authority
- Building Capabilities
- Enhancing Armaments Cooperation
- **Promoting Research & Technology**
- **Strengthening the Defence Industrial & Technological Base (DTIB)**
- Close interaction with the Member States



EDA R&T CAPTECHS

Information, Acquisition & Processing

Guidance, Energy & Materials

Environment, Systems & Modelling



IAP01
Components



GEM01
Materials



ESM01
Naval Systems and Their
Environment



IAP02
RF Sensors Systems &
Signal Processing



GEM02
Energy & Missiles and
Munitions



ESM02
Aerial Systems and
Their Environment



IAP03
Optical Sensor Systems
and Signal Processing



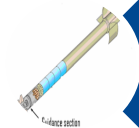
GEM03
Ground Systems and
their environment



ESM03
Systems of Systems, Battlelab,
Simulation and Training



IAP04
CIS & Networks



GEM04
Guidance and control



ESM04
Human Factors & CBR
Protection



ENDS – R&T Priorities



e.g. Electronic & Optronic
Components, Materials; key
enabling technologies etc.

e.g. Sensors, Singnal
Processing & CIS
technologies...

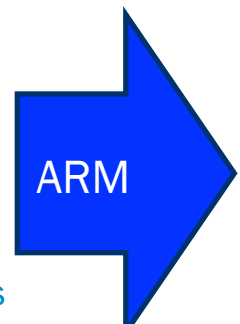
MEANS – R&T Way of Working



CapTech
Network

Strategic
Research
Agendas

WAYS – R&T Road Maps



Industrial & Technological Basis

EDA R&T Programmes - Funding & Contracting Schemes

→ Through individual **ad hoc projects** (**Cat-B** projects)

- Depend on pMS and industry interests
- Project size typically up to a few million €, duration 3 years

→ Through EDA's **operational budget**

- only small budget available, requires support from member states
- selected studies e.g. for technology roadmap and forecasts, technology market research and strategic research strategies with a duration of less than 12 month

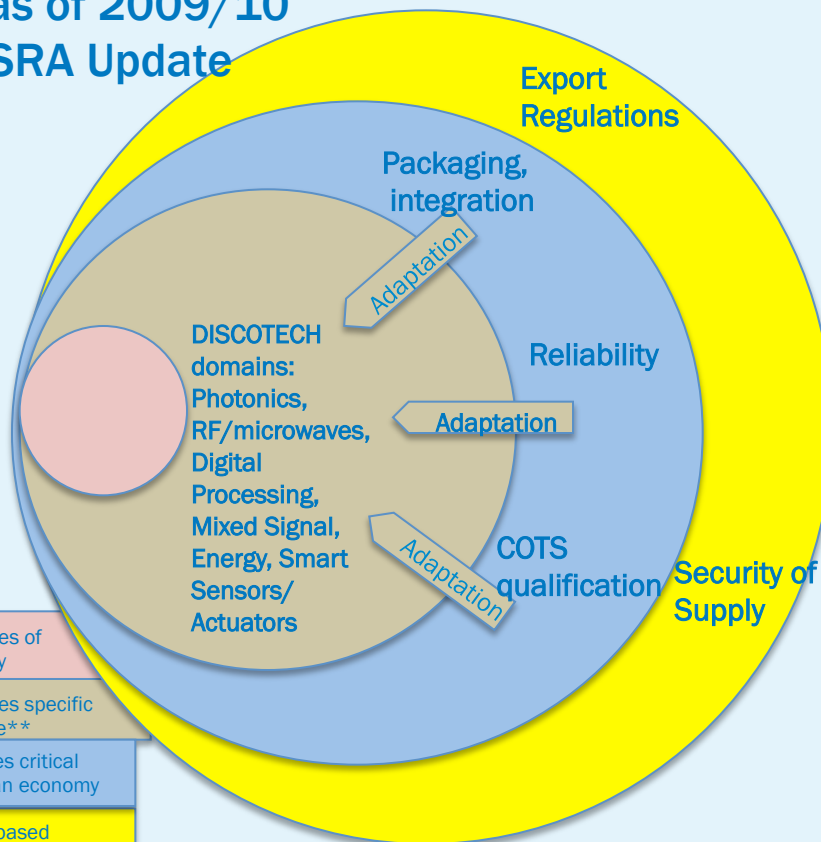
→ Through **Joint Investment** programmes

- JIP Force Protection (finished)
- JIP ICET (Innovative Concept on Emerging Technology) (final phase)
- JIP CBRN (chemical, biological, radiological and nuclear protection) (beginning phase)
- JIP UAS (in preparation)
- JIP ICET II (in preparation)
- coordinated and supported by pMS
- industry/research community bottom up innovative idea approach



IAP01 Components

- **Strategic Research Agenda**
 - EDA taxonomy
 - Based on EDA IAP1 DISCOTECH study as of 2009/10
 - SRA Update



Technologies of Sovereignty

Technologies specific for Defence**

Technologies critical for European economy

Consumer based Technologies, Far East manufacturing, US based COTS

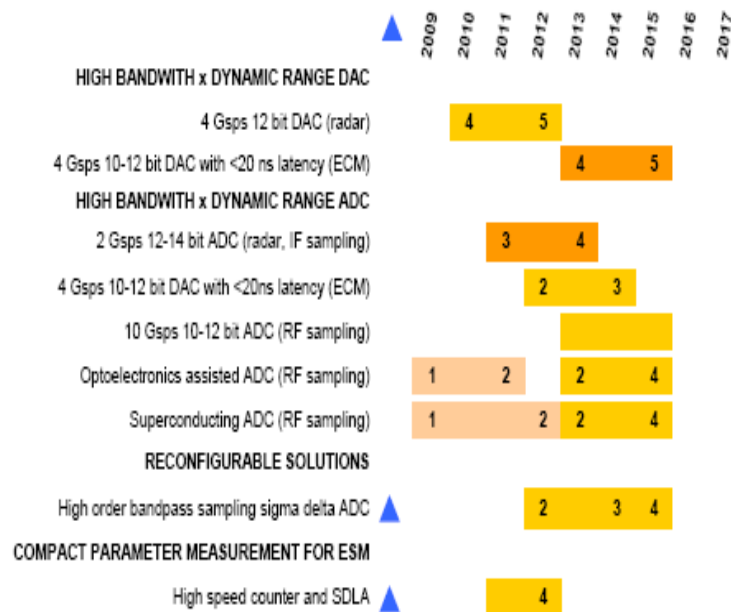


- ## Micro and Nano Electronics/Optronics in
- Optic Photonics; Opto Electronics
 - RF microWaves
 - Digital Processing
 - Power Supply & Energy Management
 - Mixed Signal incl. AD/DA
 - Sensors and Smart Actuators
 - Transversal (OPOE & Electronic Components)

Example:

Mixed Signal Analogue & Digital inclusive Conversion AD / DA,

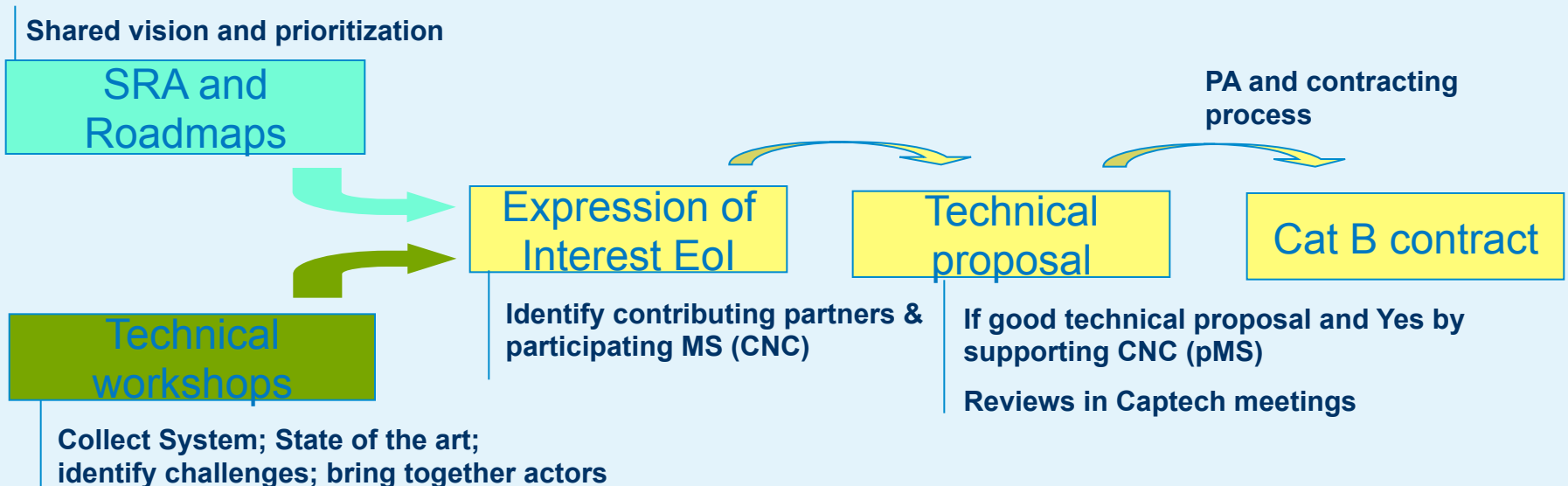
Identifies technologies where Europe, with appropriate support, can achieve world leadership.



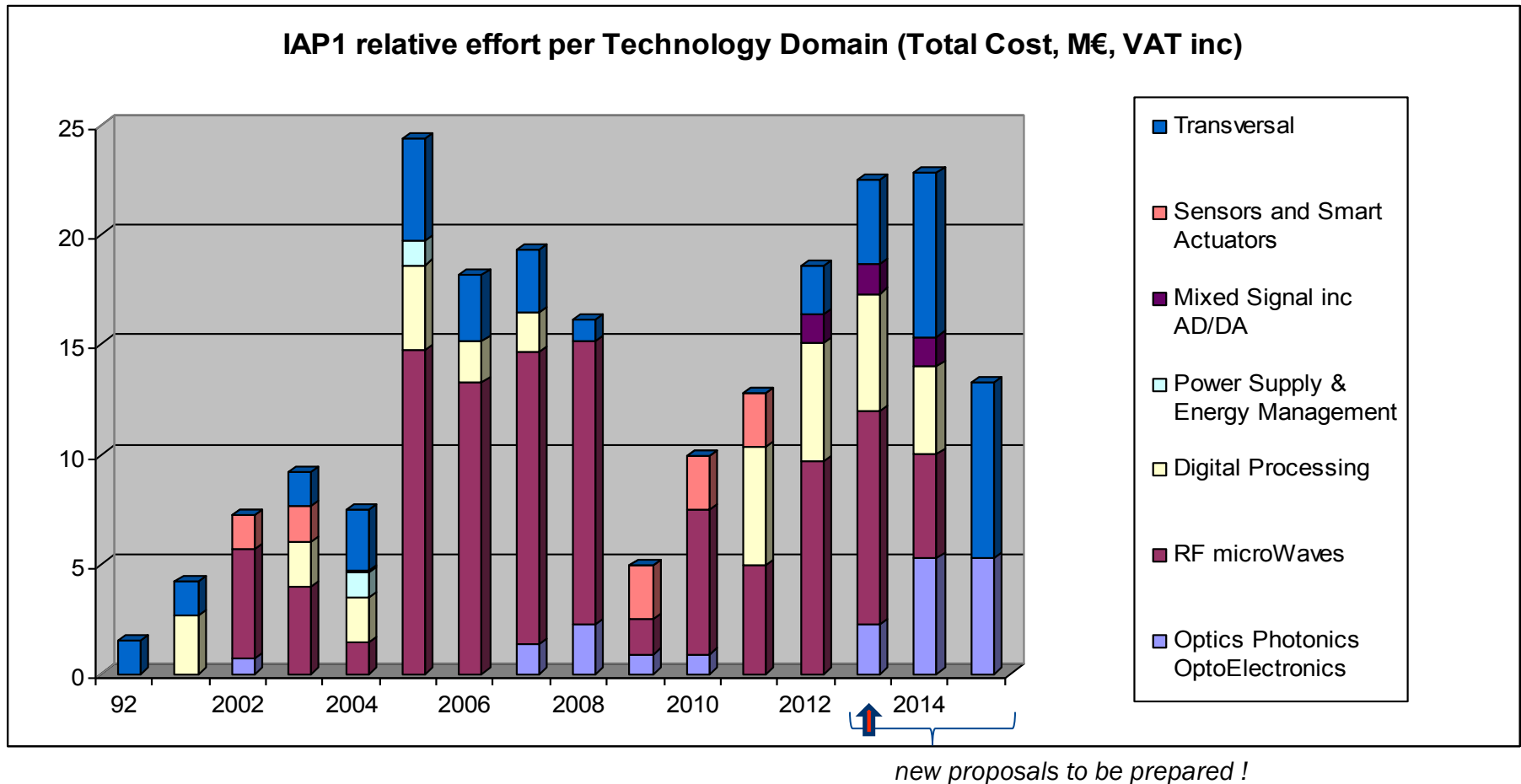


Operating EDA Captech IAP1: way of working

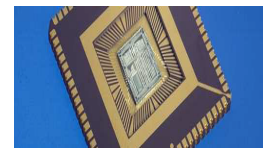
- **Management/Coordination** : 3 meetings per year – 1.5 day
- **One (or more) Workshop(s) per year**
 - **Review of one technical/technological domain** (system needs, state of the art, challenges for military applications and possible Eol)
 - **A long history of Workshops:** Opto/mW (Rome, 2002), Nanotechnologies (Paris, 2002), mW/RF disruptive/ large gap (Göteborg, 2003), Thermal management (Orsay, 2004), Signal Processing (Brussels, 2005, 180 attendees), Components for Homeland Security (Paris, 2006, 150 attendees), Power Supply and Energy Management (Brussels, 2007), Photonics (London October 2007), Discotech (Paris September 2008 110 attendees), Nanotechnology (Brussels, May 2012), PCB SRA (Brussels, (18 Oct. 2012),...
 - **Future Work shops:** PCB SRA (Brussels, May./Oct. 2013, Super Conductivity (May 2013), Energy Sources (Oct 2013), Printed Circuit Board (Oct. 2013), Meta Material (antenna & microwave applications (2014, t.b.d.):



A long history at Captech IAP1 with cooperative activities



Recently Finished Programms

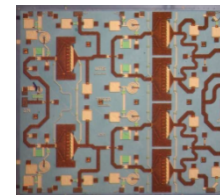


- CapTech IAP 1
- finished Cat. B projects

Project	cMS	Technology	Ends	Invt in M€
ARAMOS ARchitecture for Advanced Modulation in Optoelectronic RF oscillators & RF Systems	FR, IT	Tunable laser components; <i>demonstrate processing functions based on dual frequency laser beams</i>	2011	5,1
CODFISH Critical Optical Devices for Future Integrated Sampling Architectures	UK, IT	Optoelectronic critical components; <i>advancement of high-performance optical components; high speed optical sampling applications (≥ 4 Gsamples/s, over instantaneous bandwidths of typically 18GHz.</i>	2012	2,5
MINERVE Identification and Health Monitoring of Equipment in Real Life	IT, FR, NL	Automatic health monitoring; <i>implement a cost effective solution for real-time, continuous identification and life status monitoring of military equipments and weapon systems.</i>	2012	6,7
SWAP Switched Applications	SE, NL	Enabling technologies for active electronically scanned arrays; <i>local power generation and amplification based on switched technologies. The focus is on cost and performance.</i>	2012	4.4

Running Programms

- ➔ CapTech IAP 1
- ➔ running Cat. B projects



Project	cMS	Technology	Ends	Invest in M€
MANGA Manufacturing GaN	DE, FR, IT, SE, UK	SiC wafer manufacturing & GaN epitaxy	2013/14	16
EDA SoC EDA System on Chip Plattform	FR, IT, DE, NO	System on the Chip - design & applications	2014	22
THIMS Technology for High Speed Mixed Signal Circuits	FR, DE	High Speed Mixed Signal Circuits	2014	4,8
MAGNUS GaN with UMS GH25 process	FR, DE, UK, SE, NL	Application technologies for GaN on SiC, based on UMS GH25 process	2015	12

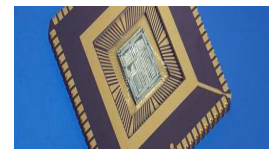
GaN Strategic Objective

To establish an independent European supply chain !



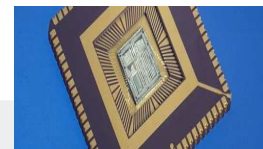
Projects in preparation

- ➔ CapTech IAP 1
- ➔ Cat B projects in preparation for OD, PA and/or contract
- ➔ Final industry proposal



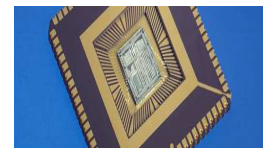
Project	cMS	Technology	Invest M€	Contract expected
PERU PACKAGING 3D FOR HETEROGENEOUS RUGGED	FR, NO	Advanced 3D Packaging for Rough Military Applications	~3,9	2013
TIPPSI THz Imaging Phenomenology Platforms for Stand-off IED detection	DE, SE, NL, PO	THz Imaging Phenomenology Platforms for Stand-off IED detection (TIPPSI)	2,1	2013
PRECISE Prediction on Reliability for Electronics Components: Implementation in Standards in Europe	FR, DE	Prediction of Reliability for Electronics Components: Implementation of Stds Europe	t.b.c.	2013
HIPPOMOS High Performances comPact Optoelectronic Microwave OScillators	FR, IT	High Performances compact Opto- electronic Microwave Oscillators	t.b.c	2013

➔ **various EOIs in preparation**



Project	Industry/ Academia from pMS	Lead	Technology	Ends
METAFORE	ES, DE, FR,	Tafco Metawire less	Forecasts in Metamaterials with Extreme Parameters for Disruptive Antennas, Radomes, and Cloaking in Radar Applications; European technology roadmap	12.2011
METALESA	ES, IT, DE, FR	Tafco Metawire less	Metamaterials & component design for Active Electronically Scanned Arrays; analysis , simulation, design	04.2013
SARape	DE, PL, HU, CY	FHG FHR	Synthetic Aperture Radar for all weather penetrating UAV applications,; 94 GHz SAR Radar, on board processing, data link and signal processing; successfully developed demonstrator	02.2013
NANOCAP	SP, IT, FR, CY	DAS	Novel NANO structured optical C omponents for CBRN detection and high perform A nce o P to-microwave links;	11.2012

Operational Budget studies



Project	Industry Academia from pMS	Lead	Technology	End
EDTID	SE, UK, FR,	FOI	European Defence Technology and Industrial Dependencies ; identification of key enabling and critical technologies and supply chains; case studies for UAS and helicopter systems	2012
PCB	FR, UK, IT, NL SE, DE	MBDA	Printed Circuit Boards for Military Applications; European technology roadmap	2013
“Non EU Dependen cies study” <i>(EDA lead I&M !)</i>	NL, UK, FR, IT	TNO	“Investing in Key Unmanned System Technologies and Capabilities”; <i>Investigation on critical payload electronics & optronics for future UAS respectively RPAS</i> <i>(kick off: Jan. 2013)</i>	2014
SRA CDTComp)	t.b.d.	t.b.d.	Strategic Research Agenda on Critical Defence Technologies for Components <i>(in preparation, II Q 2013!)</i>	2014 t.b.d.



Key Initiatives & Activities Supporting Cross Domain Synergies

➤ ESA - EDA Administrative Arrangement

➤ European Framework Cooperation

“EDA, EC and ESA aim at maximising complementary and synergy of civilian **security**, **space** and **defence** related **R&T** activities



ESA & EDA signed on
20 June 2011, Le Bourget



➤ Critical Space Technology for European non-Dependence

➔ contribution to 2nd Mapping Process; Urgent Action List 2012/13

➔ relevant running EDA Projects referenced

➔ contribution to 3rd Mapping Process: in preparation & to be conducted in 2013

➤ ETnD ASD Dual Use document: major contributions from CapTech IAP1 addressing key enabling (KET) & nano technologies in context to potential H2020

➤ EDA IAP1 and ESA info exchange:

- Wide Band Gap Semiconductor work shop, Sept. 2012

- EDA-ESA SoC work shop, Feb. 2013

- PCB

➤ ETnD: EDA work strand



EDA integrated way of working

