ECS-SRA

Introduction and overview

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The ECS SRA : It is not “yet another SRA”!

But a common ECS SRA from ECSEL JU Private Members AENEAS , ARTEMIS-IA and EPoSS

- Speak in one voice on the ECS complete Value Chain
- Improve the MASRIA and MASP elaboration processes

With the ultimate goal of generating the right set of RD&I projects

The motivation : ECS SRA to optimise the MASP preparation process

MASP elaboration process – Up to 2016

AENEAS Strategic Agenda

ARTEMIS-IA Strategic Research Agenda

Strategic Research Agenda Of EPoSS

Three Industry Associations MASRIA

Annual financial perspectives (from PAs)

ECSEL MASP

Approved by ECSEL Governing Board

Step 1

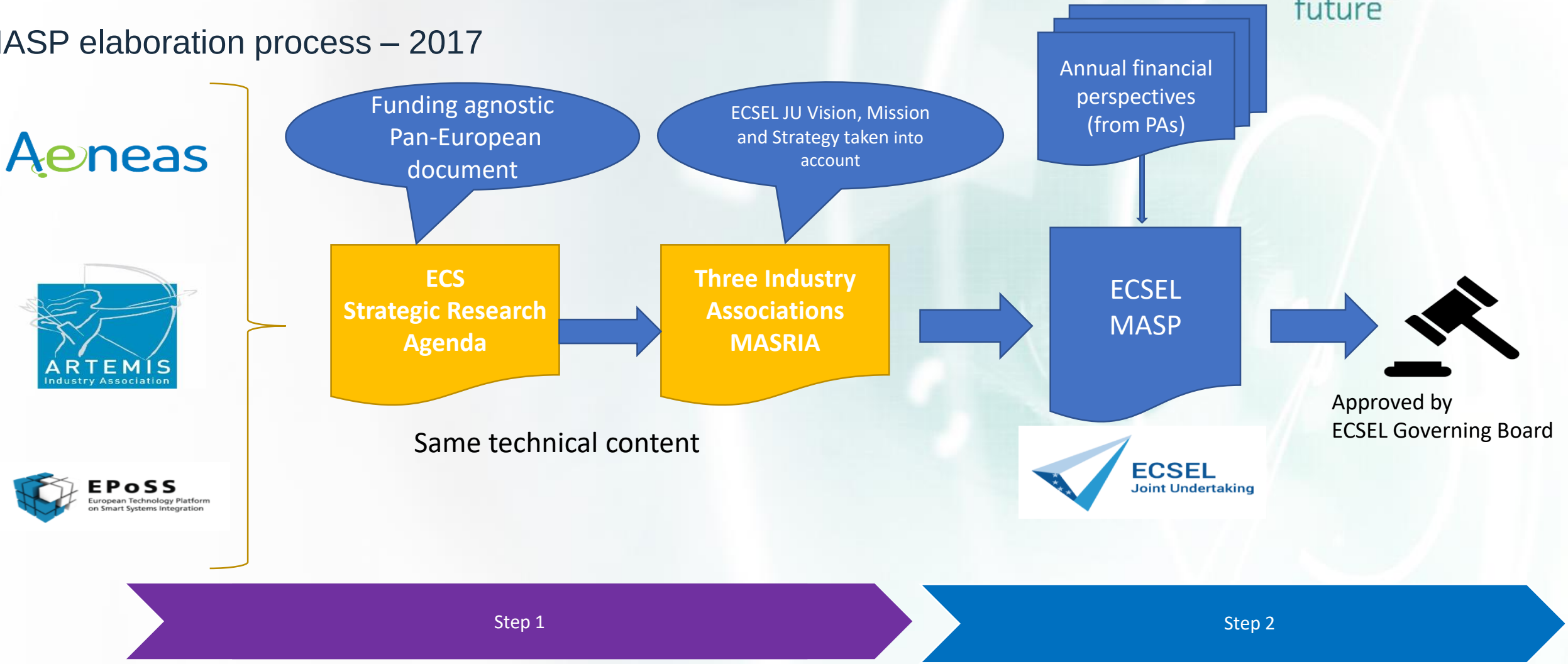
Step 2

Step 3

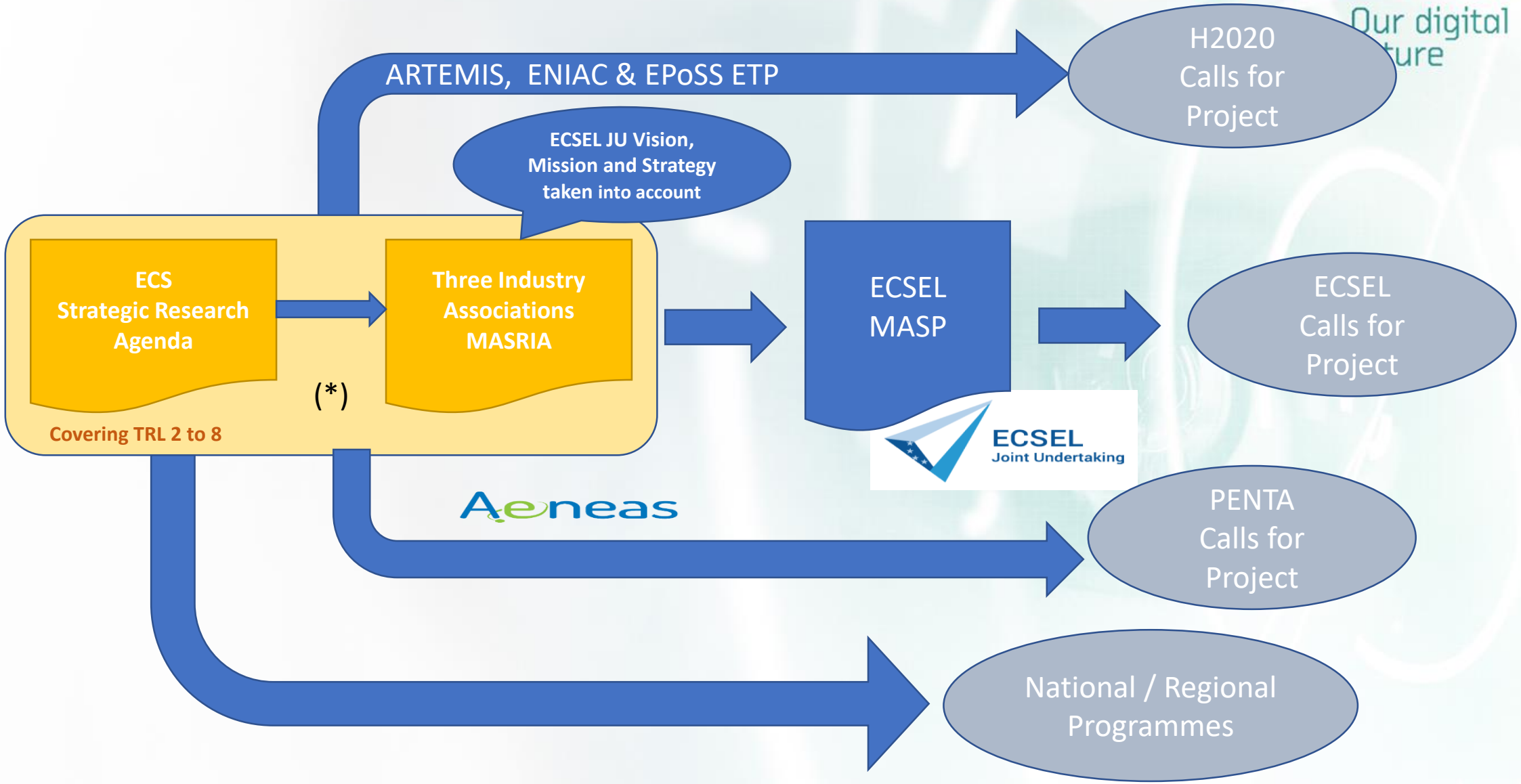
The motivation : ECS SRA to optimise the MASP preparation process

ECS 2017 Our digital future

MASP elaboration process – 2017



The motivation : ECS SRA to play a pivotal role



ECS SRA drafting guiding principles

ECS SRA rationale : Better integration of the FULL ECS Value-chain

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The ECS Value Chain stands for everything “smart”
and impacts all aspects of life and all industrial sectors

Smart products enable many applications to improve citizens quality of life and supports the creation of a smart competitive industry for increasingly digital economy.

Nano-electronics, smart systems integration, embedded intelligence and cyber-physical systems
Play dominant role in creating
innovative, smart, connected yet safe and secure products,
They are Essential building blocks for
Internet of Things and Systems of Systems

Designing and manufacturing
semiconductor chips, sensors and actuators, and integrating software and specialised interfaces that bring products to life.

ECS have a strong case in Europe digital

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Europe digital transformation is a great opportunity, as well as a pressing need, to undertake ambitious R&D&I to bring to the market products and services for the benefit of citizens, businesses and society.

Our key differentiators for the success:

- The European companies are world market leaders in the application specific semiconductor technologies 'More-than-Moore technologies' (e.g. RF, MEMS, and Power semiconductors), as well as very low power CMOS-technologies (e.g. FD-SOI)
- The traditional European strength in Cyber Physical Systems, and the on-going revolution of the Ubiquitous Computing is an opportunity to position European actors as world class leaders;
- The design of highly complex, efficient and reliable software solutions operating from micro-controllers up to complex products such as aircrafts, satellites, cars and trains to cite a few;
- highly miniaturized and tailored packaging and assembly technologies to integrate the heterogeneous components of the ECS into a low space, energy efficient package;
- a world class equipment industry which not only serves the local S/C industry but also the manufacturer of high volume standard products like microprocessors and/or memories which mainly are produced outside Europe but which performance and reliability are the base for the success of the SW within any ECS.
- A world class industry sectors in aeronautics and space, automotive, health and energy.


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The game changers and major drivers for Europe digital transformation

With the ultimate purpose of generating the right set of R&D&I projects in each area, whether an application or a capability, the SRA is built on an analysis combining factors external and internal to the European ECS industry.

The major game changers disrupting the environment within which the R&D&I strategy developed in the SRA include technical and non-technical trends, among which:

- The falling cost of all semiconductor components,
- The ubiquitous connectivity and mobility,
- Heterogeneous integration
- The advent of artificial intelligence, Data deluge, High Performance Computing,
- The new political, societal, environmental, and legal expectations
- The feel safe and secure factor
- New business model paradigms (Everything as a Service, networked enterprise,
- Vertical integration, consumers becoming prosumers,….).
- New transaction mechanisms for improved trust and security: Blockchain

The game changers and major drivers for Europe digital transformation

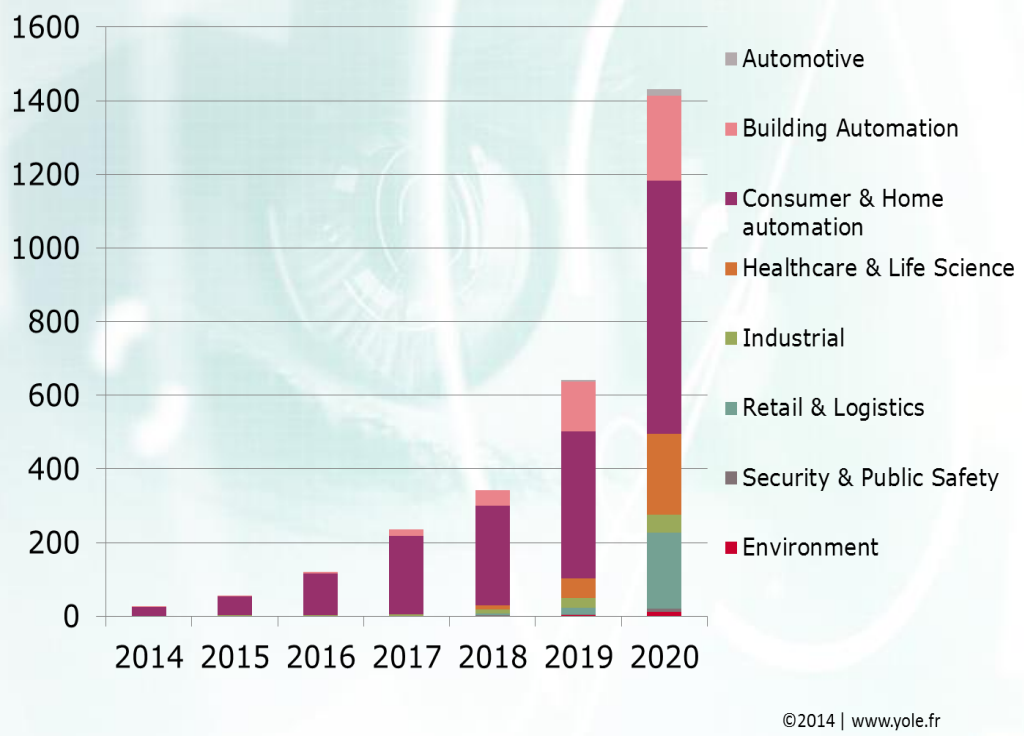
The example of: Application specific semiconductor technologies

Application specific semiconductor technologies have been, over the past years, taking an ever-increasing role in our day-to-day life.

A clear demonstration of this is the impact and the advances in sensor and actuator technologies, and the embedded software, current ADAS systems, passive and active safety solutions , minimized chargers, electric power trains in cars, the smartness of smart phones, ……. Etc …

This would not be even thinkable before.

Forecast MEMS-Worldmarket for IoT (m$)



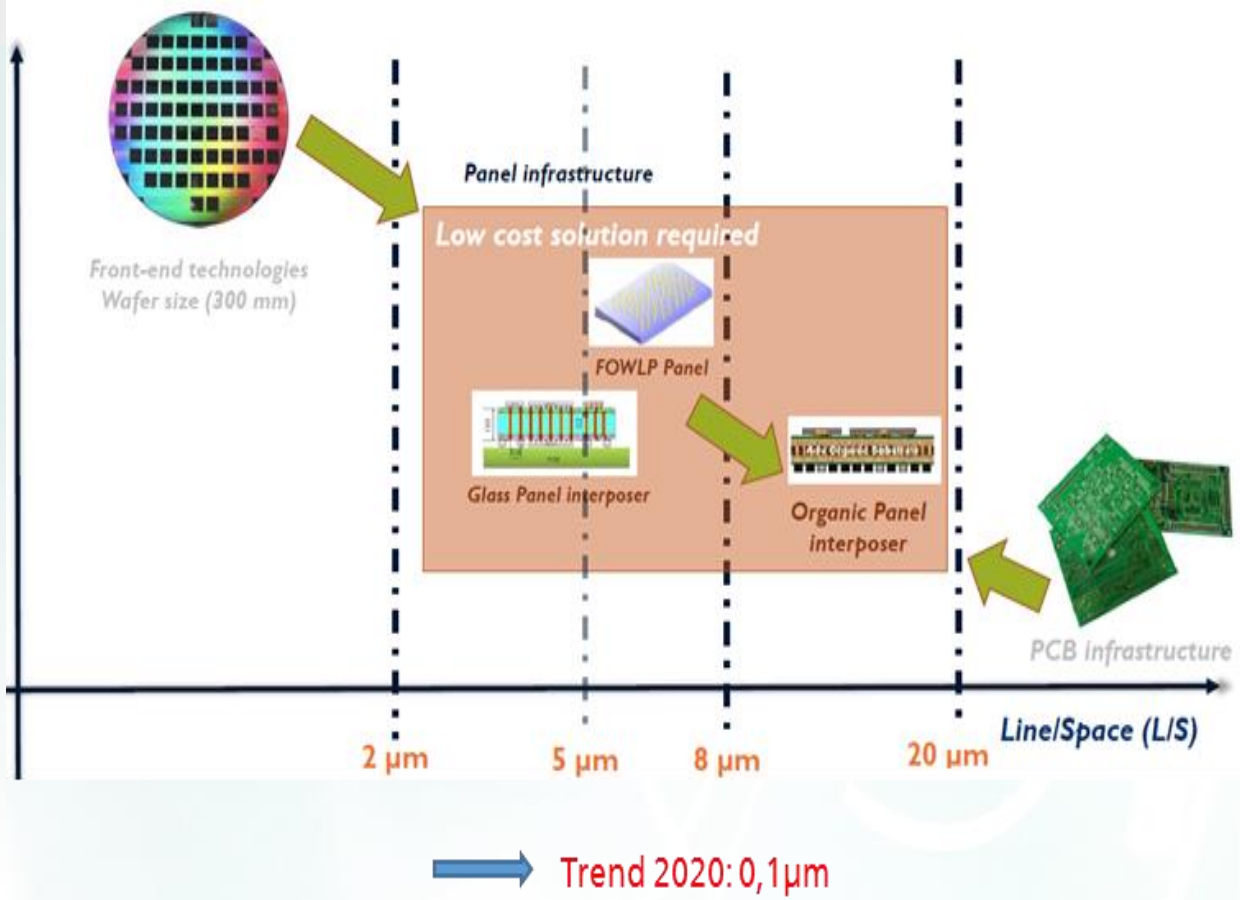
The impact of the IoT expected development on the MEMS market.

The game changers and major drivers for Europe digital transformation

The example of: Heterogeneous Integration / Comprehensive Smart miniaturised Systems

Heterogeneous integration and packaging/assembly technologies have become a key issue for the performance/reliability and cost of an ECS

Smart ECS for Europe's critical applications requires complementing logic and memories with additional features and non-scalable with Moore's Law needed to handle functions like sensing, actuating, communication, data protection and power management.



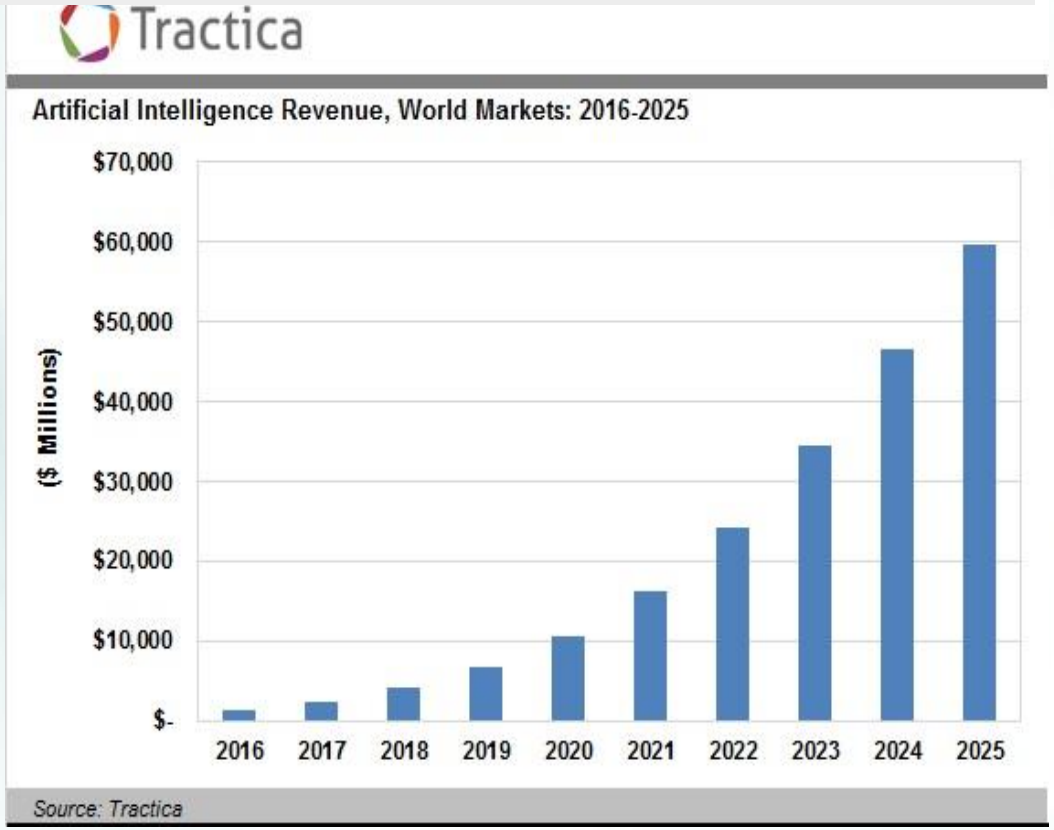
The game changers and major drivers for Europe digital transformation

The example of: The advent of artificial intelligence, Data deluge, High Performance Computing

AI will provide Smart systems with a range of novel functionalities and become a driving force behind almost all product innovations in almost every application field in the digital world, and drive research and innovation priorities.

What's in for us :

Cognitive computing , intensive embedded intelligence capabilities, cyber-physical systems with new ways to interface with the real world and humans, virtual reality, augmented reality, brain-computer Interfaces, deep learning, humans/machines interact



Revenues generated by the direct and indirect application of AI software will grow from $1.4 billion in 2016 to $59.8 billion by 2025

ECS SRA Vision, Ambition

ECS SRA Vision, Ambition

Our **Vision and Ambition** are for Europe to take a leadership role in the digital transformation by developing its capability to:

- provide the needed European digital innovation and technologies.
- generate growth, create value, jobs and prosperity, and safeguard Europe's competitiveness and sovereignty.

To achieve this Vision and Ambition, the European ECS industry, supported by Public Authorities at European, national and regional levels, must:

- Address the major technological challenges identified in the SRA.
- Pool research efforts on a number of shared priorities to avoid fragmentation and reach critical mass; setting greater synergies across the complete ECS value chain and its eco-system for a high Return on Investment.
- Foster innovative business models, coupled with adequate funding schemes for a faster go-to-market.

Proper execution of the above will reinforce EU based ECS industry, allowing it to remain among the forefront players in this domain.

ECS SRA Strategy and strategy implementation

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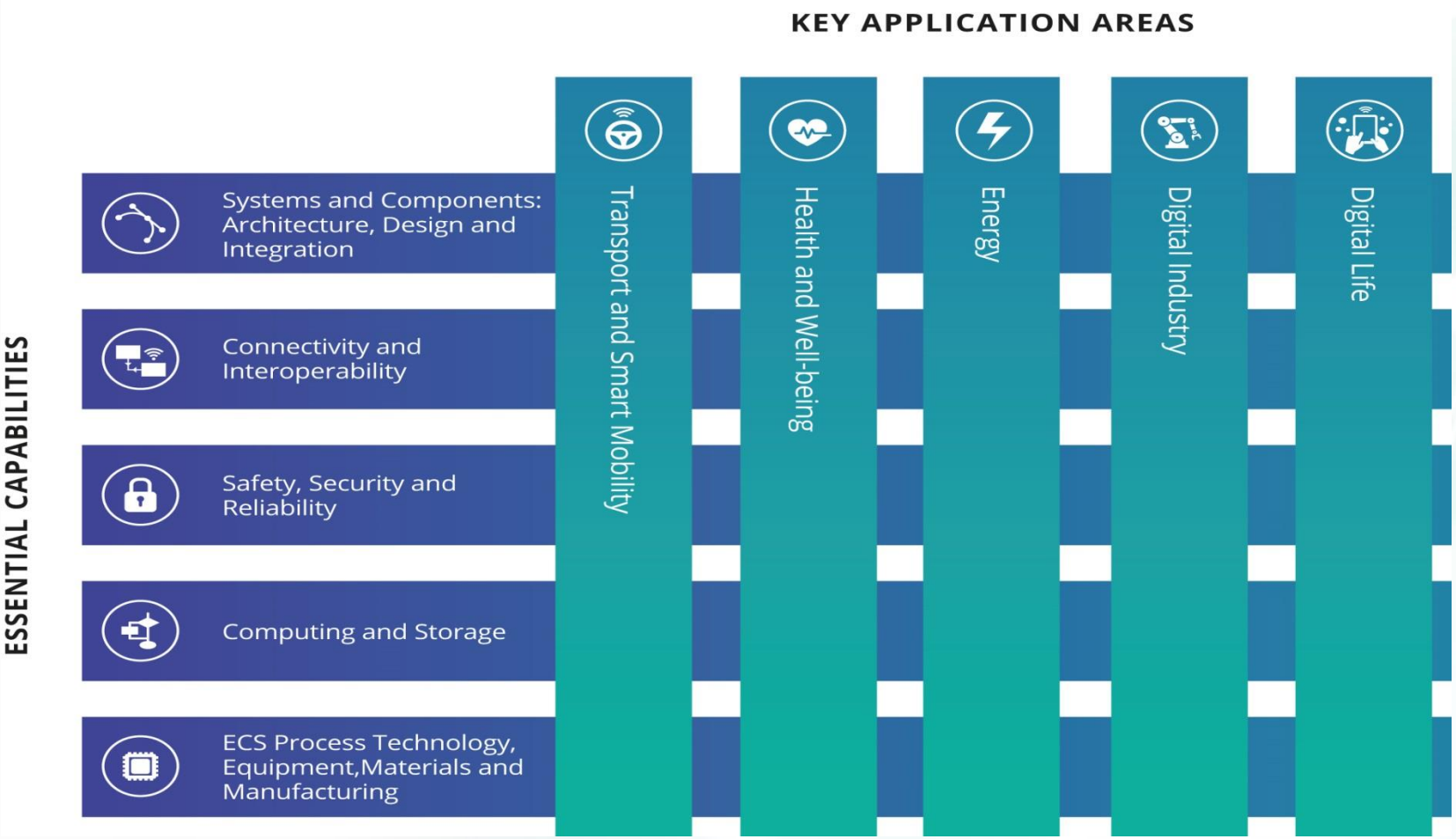
ECS SRA Strategy and strategy implementation

Top down guidance focus on 5 key applications areas & 5 essential capabilities.

- Selected market sectors represent altogether over 50% of Europe's GDP.
- Synergetic cross-domain essential capabilities



ECS SRA Strategy and strategy implementation

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Two Threads
Strategy Implementation

A Strong
EU based ECS Industry

Addressing next generation digital technologies and breakthroughs
Mission Oriented

An Efficient Europe

Pooling ECS research efforts on a number of priorities to remove barriers between application sectors

R&D&I programmes
and
Lighthouses

+

And a longer term vision

ECS SRA Strategy Implementation

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Strategy implementation:Thread One

Address next generation digital technologies and potential breakthroughs to build a strong EU based ECS, positioning Europe on the forefront in the digital Economy

Achieve excellence on priority areas taking into account the European societal needs, quality of life, safety and security, ethics, and sustainability

Build on European existing technological strengths: for both sovereignty and market strong positions in areas such as low power consumption, high performance computing, high power, sensors, smart systems integration, safety and security

Develop technologies up to high TRL: (e.g. Pilot Lines) for innovation market up-take

Think big and act fast: speed is of essence to achieve economy of scale, innovate and act efficiently on the global market

ECS SRA Strategy Implementation

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Strategy implementation Thread Two

Pool research efforts on priorities that remove barriers between application sectors

Build better and more efficient European technological solutions for greater combined strength in the context of global competition

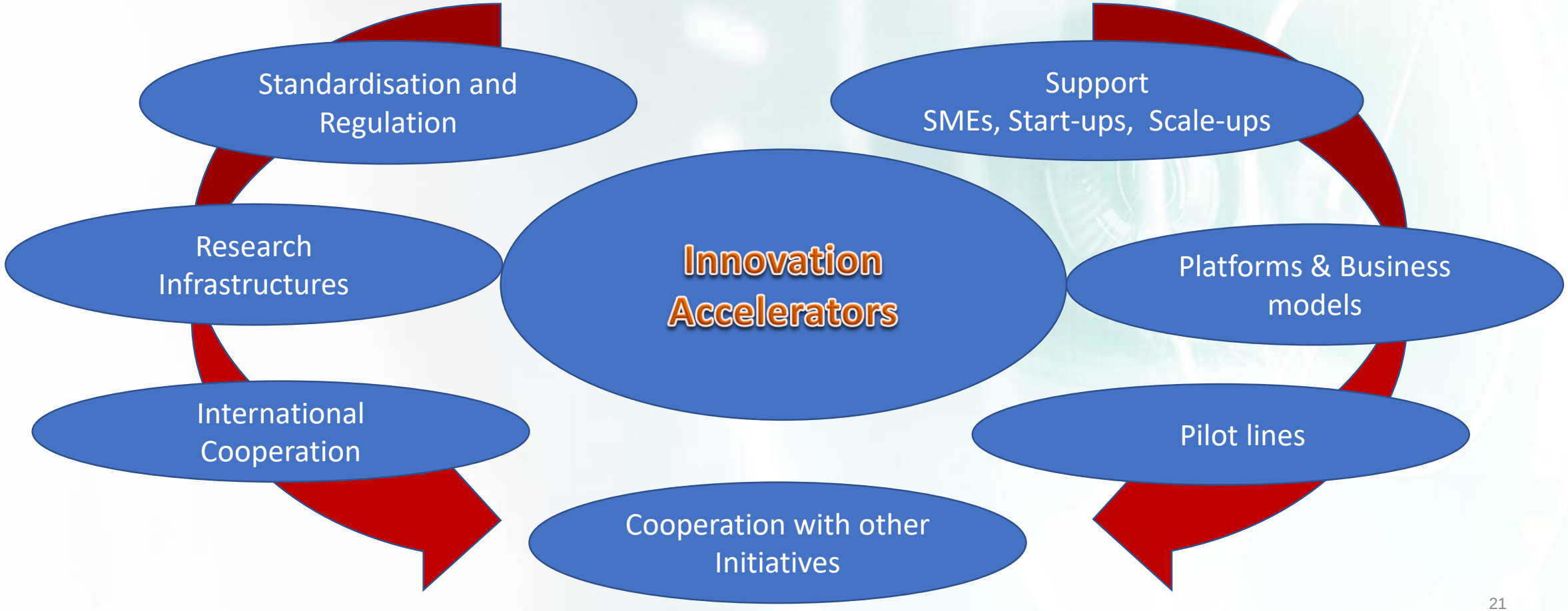
Foster proposals where there is real value creation

Encourage projects addressing the whole value chain & leveraging vertical integration

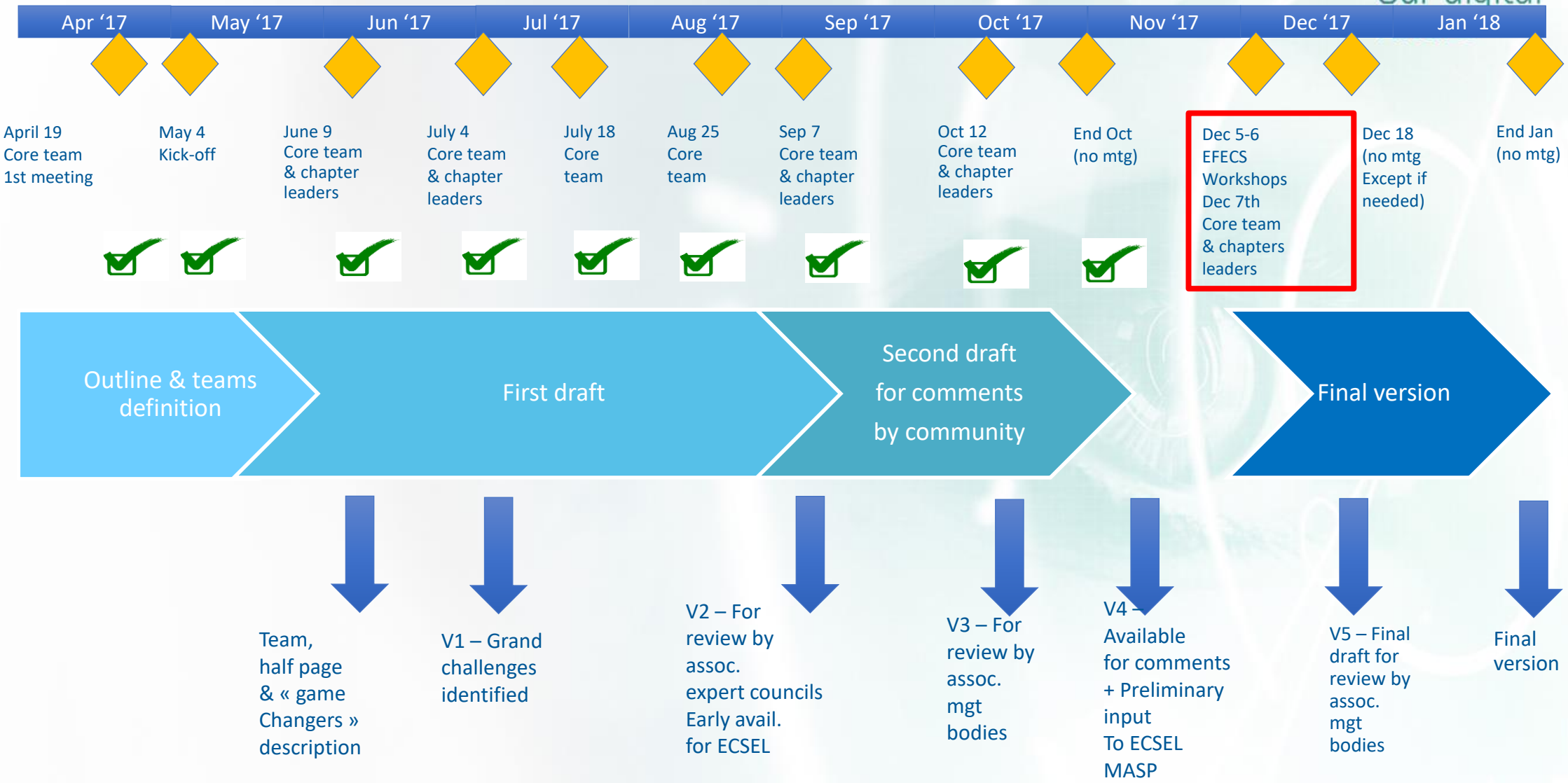
Platform approach adoption as an “innovation accelerator” for a faster “go-to-market”.

The Innovation accelerators to make it happen

"However successful they may be, research projects do not resolve societal challenges and create economic value and bring results to market for Europe without a proper environment that foster innovation"



ECS SRA elaboration process



The People behind

Core team and chapters owners

Chair: Laila Gide (Thales)

Core team: Patrick Cogez (Leader, AENEAS), Renzo Dal Molin (Cairdac), Marc Duranton (CEA), Mart Graef (TU Delft), Paul Merkus (Philips), Sven Rzepka (Fraunhofer), Arnaud Samama (Thales)

Chapters co-Leaders

Chapt 1: Transport and Smart Mobility: Michael Paulweber (AVL) ; Patrick Pype (NXP)

Chapt 2 : Health and Well-Being: Ronald Begeer (Philips Healthcare) ; Renzo Dal Molin (Cairdac)

Chapt 3: **Energy**: Wolfgang Dettmann (Infineon); Pertti Raatikainen (VTT); Antonio Imbruglia (STM)

Chapt 4: Digital Industry: Knut Hufeld (Infineon) ; Mika Karaila (Valmet) ; Olli Ventä (VTT)

Chapt 5: Digital Life: Paul Merkus (Philips) ; Mario Diaz-Nava (STM)

Chapt 6: Systems and Components: Architecture, Design and Integration: Jürgen Niehaus (SafeTrans) ; Ralf Popp (EdaCentrum) ; Reinhard Neul (Robert Bosch)

Chapt 7: Connectivity and Interoperability: Frédéric Gianesello (STM) ; Jerker Delsing (Lulea U.T)

Chapt 8: Safety, Security and Reliability: François Tuot (Gemalto) ; Daniel Watzenig (Virtual Vehicle)

Chapt 9: Computing & Storage: Marc Duranton (CEA) ; Huy-Nam Nguyen (ATOS)

Chapt 10: Electronic Components &Systems Process Technology, Equipment, Materials and Manufacturing: Jo de Boeck (IMEC) ; Arco Krijgsman (ASML)

Over 250 experts across the 10 chapter teams

Thank you for your attention