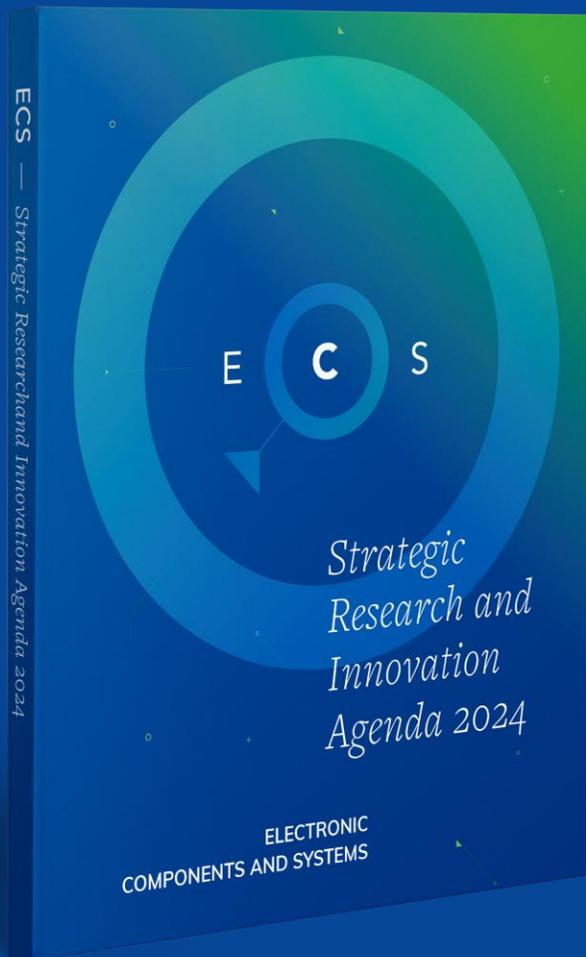


ECS SRIA 2024

2024 ECS Brokerage Event Brussels, 20 February 2024

Patrick Coge, AENEAS, ECS SRIA Chairman

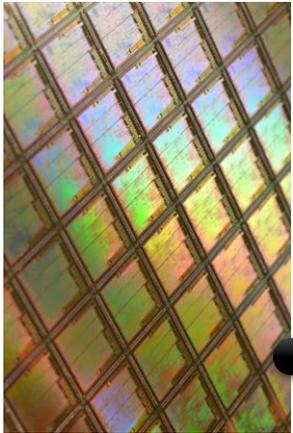


*Strategic Research and
Innovation Agenda 2024*

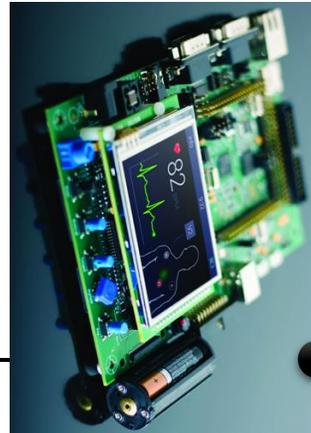


The ECS SRIA - What and Why ?

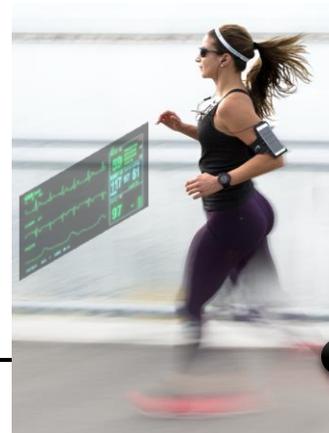
- Collective work of experts across industry, RTO and academia
- Presenting research topics to be investigated over next 15 years
- To foster and accelerate our European digital transformation reflecting European values
- A tool to align and coordinate research policies across Europe
- Covering the whole ECS value chain



**Materials, processes,
semiconductors, micro
& nano electronic
components, ...**



**Smart sensors,
integrated devices, edge
AI, embedded SW, ...**



**Systems and applications,
value creation, societal
goals, ...**



ECS engineering tools

The ECS-SRIA 2024

Basis for the CHIPS JU 2024 Calls for R&I Activities



The ECS SRIA Team 2024



Patrick Coge
AENEAS
Chairman



Paolo Azzoni
Inside IA
Co-chairman



Nicolas Gouze
EPoSS
Co-chairman

Core Team

- Arco Krijgsman - ASML
- Christophe Wyon - CEA
- Jerker Delsing - LTU
- Jürgen Niehaus - Safetrans
- Patrick Pype - NXP
- Sven Rzepka - Fraunhofer
- Wolfgang Dettmann - Infineon

More than 300 European experts

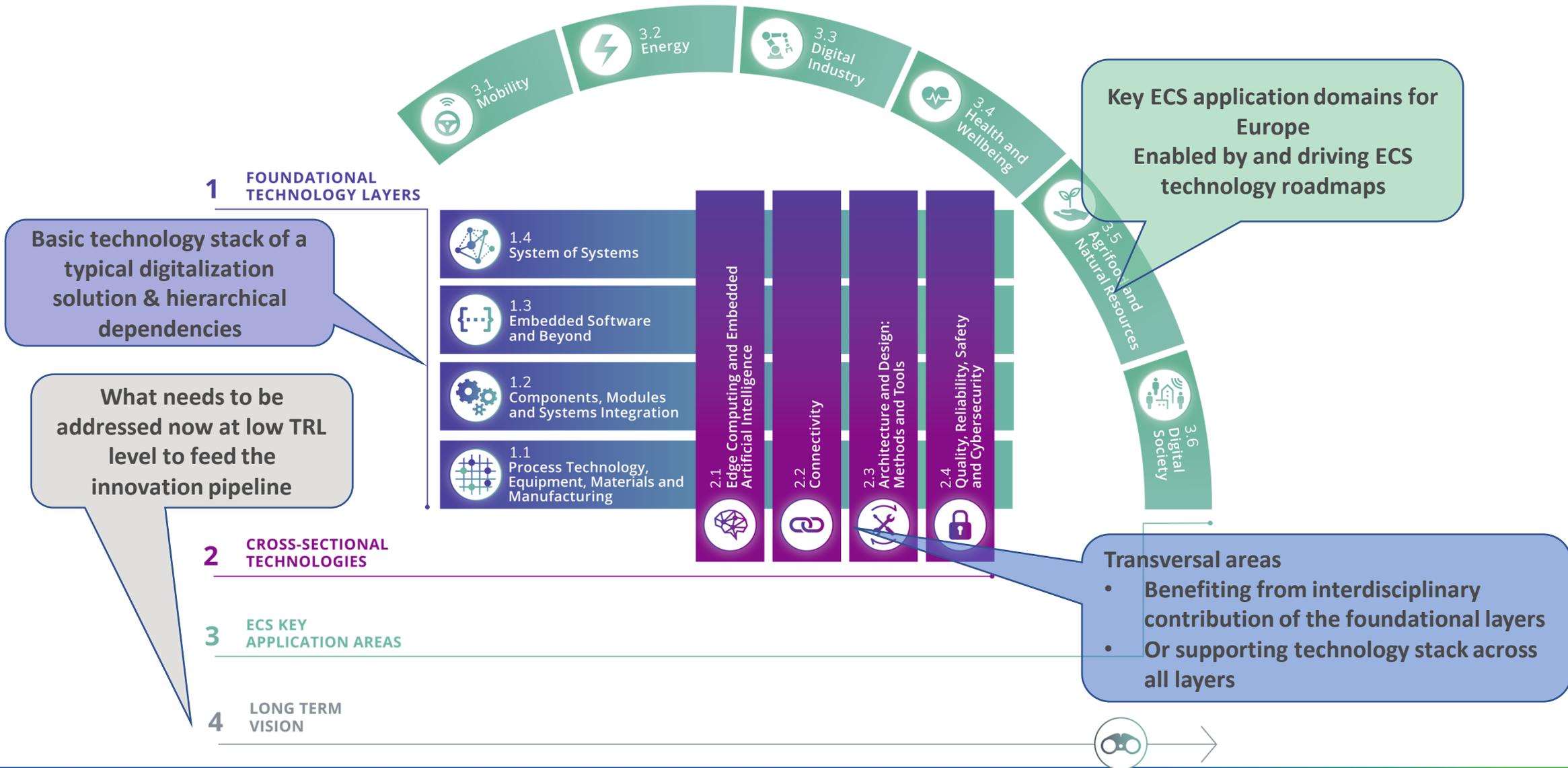
- Interdisciplinary
- Across the whole ECS value chain
- Representing industry, RTO and academia
- Involved in R&I programmes and standardization activities
- Across almost all participating states

SRIA Synergies in R&I Landscape

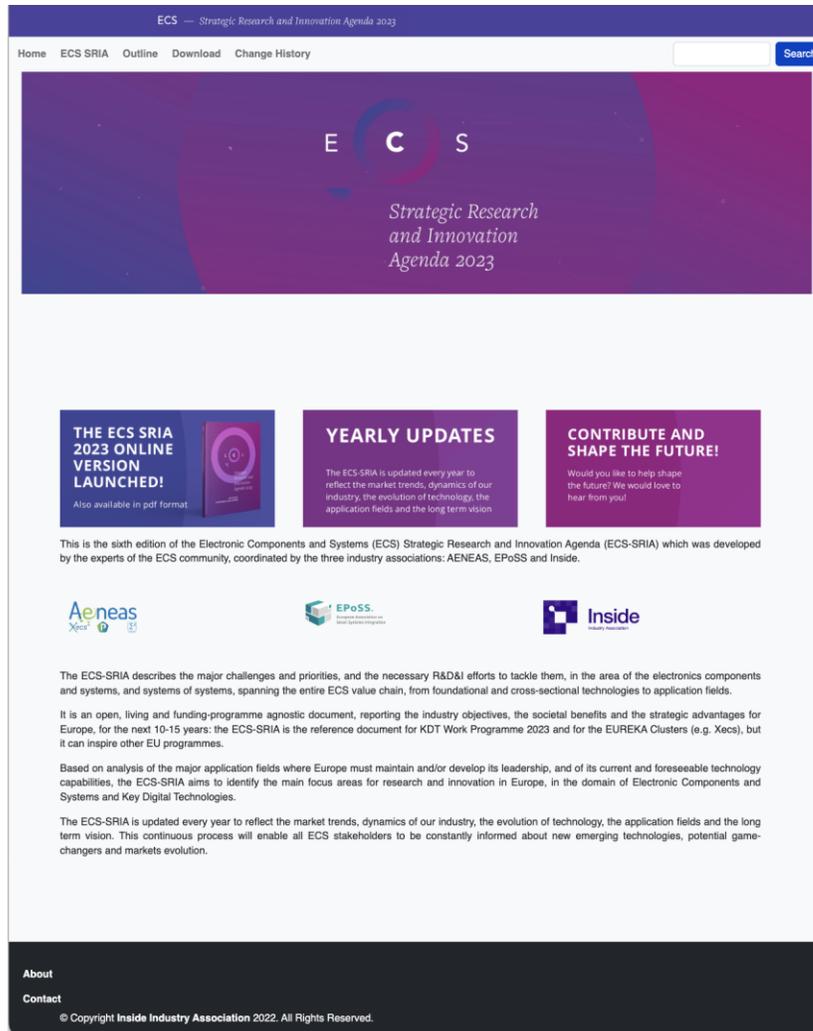


And many others...

ECS-SRIA structure

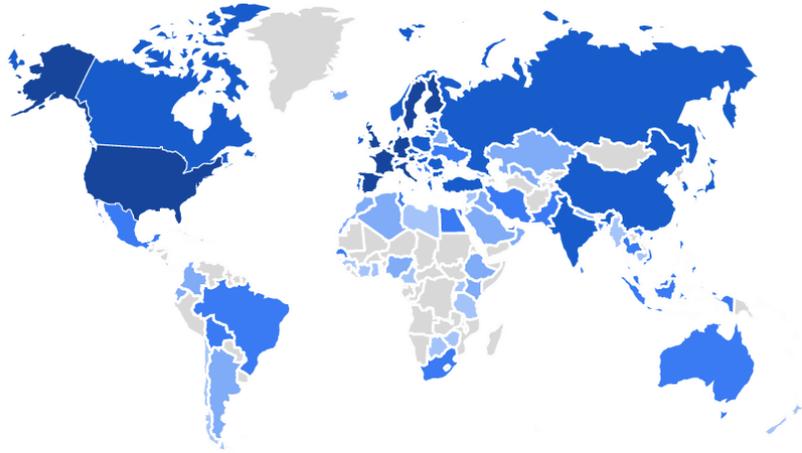


ECS-SRIA Web Site



- ECS-SRIA 2024 available for publication from the 06/02/2024
- Web version only: <https://ecssria.eu/>
- Increased visibility and accessibility
- Simple to browse with hyperlinks
- Attract new talents and experts
- Native indexing and analytics
- More advanced functionalities for:
 - Topics search
 - Selective reading
- W3C standard

Users by Country in the last 12 Months



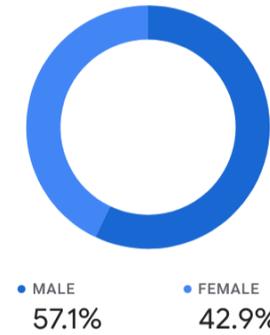
<u>COUNTRY</u>	<u>USERS</u>
Netherlands	1.3K
France	1.2K
Finland	1K
United States	1K
Germany	976
Austria	724
Spain	467

1	Netherlands	1,257	21	Poland	90
2	France	1,157	22	Canada	80
3	Finland	1,005	23	South Korea	66
4	United States	1,004	24	Denmark	63
5	Germany	976	25	Luxembourg	52
6	Austria	724	26	Taiwan	52
7	Spain	467	27	Czechia	45
8	Italy	430	28	Singapore	38
9	Belgium	380	29	Romania	36
10	Sweden	373	30	Israel	35
11	United Kingdom	315	31	Latvia	34
12	Türkiye	270	32	Hungary	32
13	China	148	33	Slovenia	32
14	Portugal	136	34	Estonia	22
15	Greece	126	35	Hong Kong	22
16	Ireland	125	36	Lithuania	22
17	Norway	116	37	Russia	22
18	Switzerland	112	38	United Arab Emirates	20
19	Japan	110	39	Bulgaria	19
20	India	95	40	Ukraine	16

Visited from a total of 110 countries

Accesses and user number (last 12 months)

ECS-SRIA PAGE, PART, CHAPTER	Accesses	Users
About	8111	4514
Introduction and overview	8604	4621
ECS SRIA outline	1610	917
1. Foundational Technology Layers (total for part 1)	8019	2355
1.1 Process Technology, Equipment, Materials And Manufacturing	3426	671
1.2 Components, Modules and Systems Integration	2070	709
1.3 Embedded Software and Beyond	1480	538
1.4 System of Systems	1043	437
2. Cross-Sectional Technologies (total for part 2)	6165	2407
2.1 Edge computing and embedded Artificial Intelligence	2576	986
2.2 Connectivity	1220	354
2.3 Architecture and Design: Method And Tools	1439	710
2.4 Quality, Reliability, Safety And Cybersecurity	930	357
3. ECS Key Application Areas (total for part 3)	6092	2239
3.1 Mobility	1429	487
3.2 Energy	884	333
3.3 Digital Industry	1066	384
3.4 Health & Wellbeing	1139	452
3.5 Agrifood And Natural Resources	842	271
3.6 Digital Society	732	312
4. Long-Term Vision	872	398



The number of accesses and users is equally distributed across the the main parts

Main interests of users according to Google Analytics:

1. Technology (54% of the users)
2. Economy (40% of the users)
3. Business (37% of the users)
4. Politics (33% of the users)

Total number of visits to the entire website: 48120

ECS SRIA 2024 Edition

Short demo

<https://ecssria.eu/>

ECS SRIA 2024 Edition

What's new ?

Link with Pilot Lines and the Design Platform



- Principles
 - SRIA is the industry expression of its R&I plans, and is funding instrument agnostic
 - The SRIA will not address how Pilot Lines and the Design Platform must be run
 - It can however identify research topics of interest for the industry where Pilot Lines and the Design Platforms can help
 - This will feed the research roadmaps of these mechanisms
- Main SRIA updates
 - New chapter 0 (Introduction) section
 - Updated Chapter 2.3 (Architecture and Design – Methods and Tools)

New Chapter 0 Section “Make it happen”



- Rationale for addressing the design platform and pilot lines within the ECS SRIA
- Table linking SRIA chapters and those instruments
 - Pilot lines being considered : The three most likely to be launched in a first batch (as of the time of finalising the SRIA 2024 edition)
 - Additional column for other pilot lines
 - Partial view :

	Design platform	Advanced 2nm and beyond	FD-SOI	Advanced Packaging and Heterogeneous Integration	Other pilot lines
1.1 Process Technology, Equipment, Materials and Manufacturing		Launching ground for new processes, equipment technologies and materials	Low-power consumption, radiation hardness, More than Moore app.	Introduce materials and process innovations as well as advanced manufacturing, test and inspection equipment for future AP/Hi systems.	
1.2 Components, Modules and Systems Integration	Improve design capabilities to become a closed loop (i.e., to include feedbacks from the production process and from the field use, respectively) as well as define the new sets of interfaces for the complex integration solutions at die / module / system levels as needed for implementing heterogeneous and chiplet approaches - in particular for ECS applications that will be exposed to demanding and harsh environments (as these ECS are essential for our European backbone industry -automotive, energy, industry, health, ...- and not sufficiently and securely addressed by the worldwide leading players).	Impact of advanced node inflections like backside power distribution networks, forsheet, CFET and 2D material channels 3D heterogeneous integration in chiplet implementation		Enable enhanced and diversified functionalities (e.g. combined sensing, processing, communication, ...) in small form factor electronic components and systems.	Platforms leading to the scalability of elements enabling connection between the digital and physical worlds (e.g. MEMS, integrated photonics, power electronics, quantum approaches...) in silicon or silicon alternative technologies will provide, together with logical circuitry, additional essential building blocks to be integrated in full fledged electronic systems
1.3 Embedded software and Beyond		Design Technology Co-Optimisation	Design Technology Co-Optimisation		



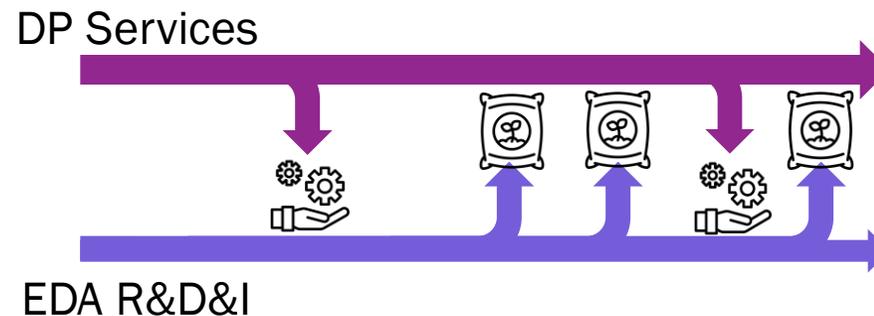
- Specific expectations vs. the design platform

Updated Chapter 2.3

Adds-on regarding Design Platform



- Strategic advantage for the EU
 - DP expected to support technical enhancements and facilitate the development of ecosystems
- For each Major Challenge, addition of two aspects
 - R&I focus areas which could be supported by the design platform
 - Research feeding design platform evolution



Artificial Intelligence



- ECS as an enabler of AI
 - Meeting performance needs
 - New concepts and architectures mitigating AI-related energy consumption
 - Moving towards AI at the edge
 - In-memory computing
- AI as an enabler of ECS
 - AI-based methods for ECS architecture exploration and optimization
 - AI-based guidance in the V&V process
 - Automatic generation of test cases
- AI support to manage AI-induced complexity
- Trustable, responsible AI-based ECS

Quantum Technologies



- Joint workshops organized in 2023 between ECS SRIA chapter leaders and QuIC Working Group leaders
 - QuIC: European Quantum Industry Consortium
- Developments in several chapters on
 - Quantum sensing
 - Quantum computing
 - Quantum cryptography
 - Enabling ECS technologies

Sustainability



- Can be found under many SRIA Chapters
 - Specific additions this year in chapters 1.2 and Long Term Vision
- Eco-Design of ECS to promote circularity
 - Set up repair process
- Sustainable manufacturing of ECS
 - Zero waste
 - Natural resource consumption reduction & reuse (power, water)
 - Reduce CO₂ and Green House Gas emissions
 - Handling the PFAS challenge
 - Critical raw materials use
- Sustainable products and business models
 - Repair index
 - Product categories
 - Repair as business

... and many other updates

- Tighter integration with RISC-V and Open Source HW
- Lidar, radar and camera integration
- Photonics integration
- Hardware virtualisation for efficient software engineering
- New frequency bands for 6G
- EDA research topics
- SoC for mobility
- Software-defined vehicle
- Revisiting the European health ecosystem
- Agriculture decarbonisation

The 2024 SRIA is completed... Long live the 2025 edition !



Patrick Coge
AENEAS
Chairman



Paolo Azzoni
Inside IA
Co-chairman



Matthias Küntzel
EPoSS
Co-chairman

- Kick-off meeting 21/02/2024 (with chapter leaders)
- Aiming at conciseness... while still meeting the needs of the technical community
- Target delivery date – October 2024
 - For adoption by GB in November meeting
- Dedicated group focused on a new “synopsis” document



Final words

- The ECS SRIA covers the R&I needs identified by the ECS industry
- It plays a major role in aligning R&I priorities within the ECS community with funding instruments
- It is a coordination and knowledge exchange instrument with other communities
- Moving to the Chips Act increases its relevance
- You can (and should) be part of it !

THANK YOU !



*Strategic Research and
Innovation Agenda 2024*

