Current and future funding opportunities in semiconductors

Slovenia Business & Research Association

25 November 2022

Arian Zwegers

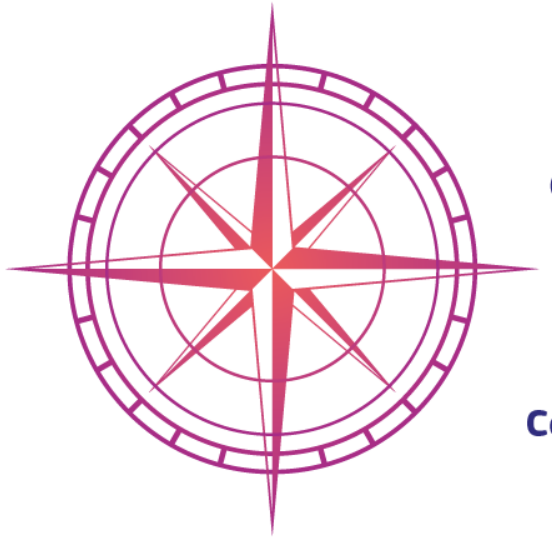
Overall Vision: 2030 Digital Decade

Skills

ICT Specialists: 20 million + Gender convergence
Basic Digital Skills: min 80% of population

Public Services

Key Public Services: 100% online
e-Health: 100% availability medical records
Digital Identity: 80% citizens using digital ID



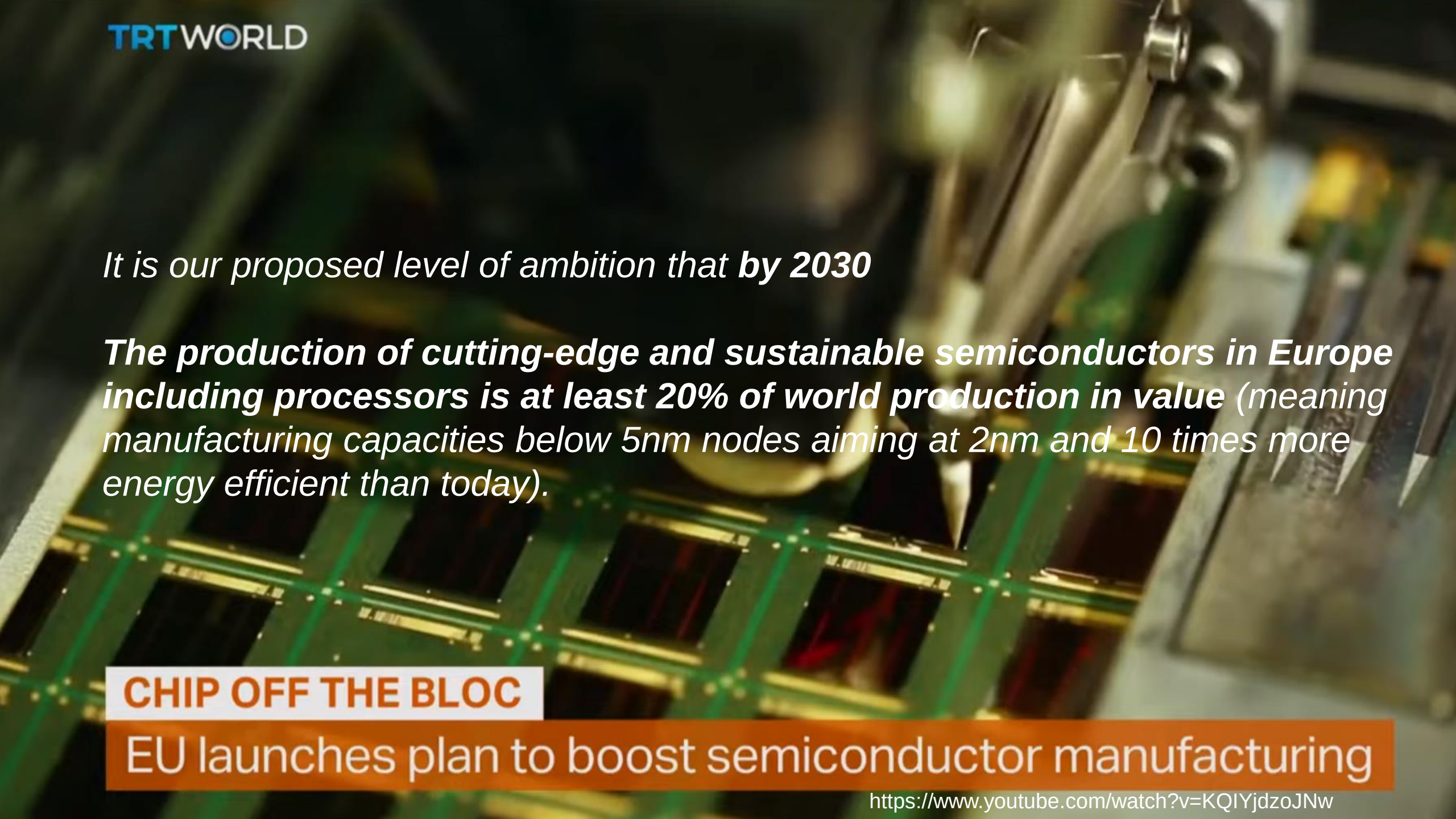
Infrastructures

Connectivity: Gigabit for everyone, 5G everywhere
Cutting edge Semiconductors: double EU share in global production
Data – Edge & Cloud: 10,000 climate neutral highly secure edge nodes
Computing: first computer with quantum acceleration

Business

Tech up-take: 75% of EU companies using Cloud/AI/Big Data
Innovators: grow scale ups & finance to double EU Unicorns
Late adopters: more than 90% of European SMEs reach at least a basic level of digital intensity

European Commission



https://www.youtube.com/watch?v=KQIYjdzoJNw

Horizon Europe

Total 95.5 B€, in current prices

HORIZON EUROPE

8.0 Bn

SPECIFIC PROGRAMME: EUROPEAN DEFENCE FUND

Exclusive focus on defence research & development

- Research actions
- Development actions

86.1 Bn

SPECIFIC PROGRAMME IMPLEMENTING HORIZON EUROPE & EIT*

Exclusive focus on civil applications

Pillar I
EXCELLENT SCIENCE

- European Research Council
- Marie Skłodowska-Curie
- Research Infrastructures

Pillar II
GLOBAL CHALLENGES & EUROPEAN INDUSTRIAL COMPETITIVENESS

Clusters

- Health
- Culture, Creativity & Inclusive Society
- Civil Security for Society
- Digital, Industry & Space
- Climate, Energy & Mobility
- Food, Bioeconomy, Natural Resources, Agriculture & Environment

Joint Research Centre

Pillar III
INNOVATIVE EUROPE

- European Innovation Council
- European Innovation Ecosystems
- European Institute of Innovation & Technology

WIDENING PARTICIPATION AND STRENGTHENING THE EUROPEAN RESEARCH AREA

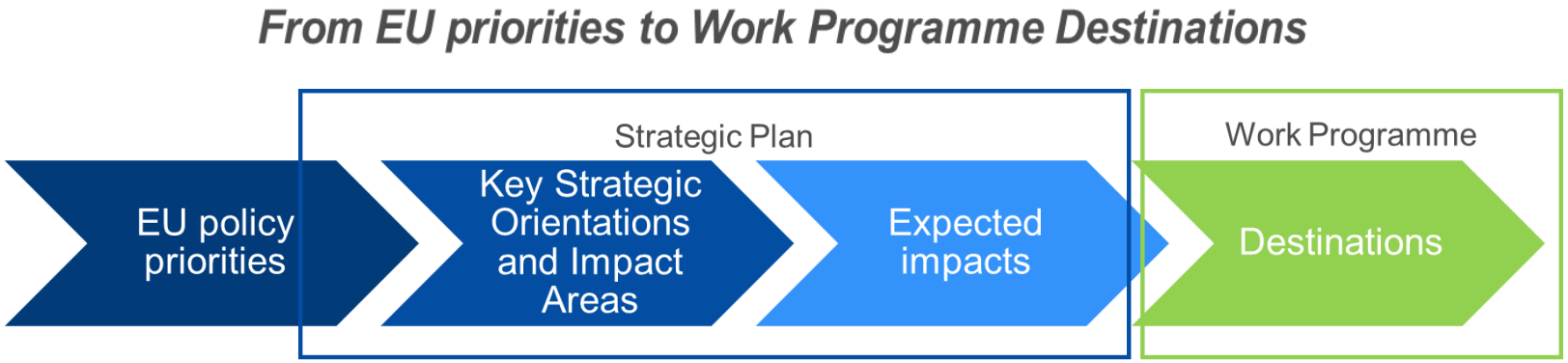
- Widening participation & spreading excellence
- Reforming & Enhancing the European R&I system

EURATOM

1.4 Bn

- Fusion
- Fission
- Joint Research Centre

Cluster 4 – Strategic Priorities



Cluster 4 directly supports three of the four Key Strategic Orientations of the Strategic Plan 2021-2024:

- Promoting an open strategic autonomy by leading the development of key digital, and enabling and emerging technologies, sectors and value chains (A)
- Making Europe the first digitally enabled, circular, climate-neutral and sustainable economy (C)
- Creating a more resilient, inclusive and democratic European society (D)

https://ec.europa.eu/info/sites/default/files/research_and_innovation/funding/documents/ec_rtd_horizon-europe-strategic-plan-2021-24.pdf

KEY STRATEGIC ORIENTATION	EXPECTED IMPACT	DESTINATION
Making Europe the first digitally enabled, circular, climate-neutral and sustainable economy (C)	**Global leadership in clean and climate-neutral industrial value chains, circular economy and climate-neutral digital systems and infrastructures (networks, data centres)**, through innovative production and manufacturing processes and their digitisation, new business models, sustainable-by-design advanced materials and technologies enabling the switch to decarbonisation in all major emitting industrial sectors, including green digital technologies.	TWIN-TRANSITION
Promoting an open strategic autonomy by leading the development of key digital, and enabling and emerging technologies, sectors and value chains (A)	**Industrial leadership and increased autonomy in key strategic value chains with security of supply in raw materials,** achieved through breakthrough technologies in areas of industrial alliances, dynamic industrial innovation ecosystems and advanced solutions for substitution, resource and energy efficiency, effective reuse and recycling and clean primary production of raw materials, including critical raw materials and leadership in circular economy.	RESILIENCE
	Globally attractive, secure and dynamic data-agile economy by developing and enabling the uptake of the next-generation computing and data technologies and infrastructures (including space infrastructure and data), enabling the European single market for data with the corresponding data spaces and a trustworthy artificial intelligence ecosystem.	DATA
	Open strategic autonomy in digital technologies and in future emerging enabling technologies by strengthening European capacities in key parts of digital and future supply chains, allowing agile responses to urgent needs, and by investing in early discovery and industrial uptake of new technologies.	DIGITAL-EMERGING
	Open strategic autonomy in developing, deploying and using global space-based infrastructures, services, applications and data, including by reinforcing the EU's independent capacity to access space, securing the autonomy of supply for critical technologies and equipment and fostering the EU's space sector competitiveness.	SPACE
Creating a more resilient, inclusive and democratic European society (D)	**A human-centred and ethical development of digital and industrial technologies**, through a two-way engagement in the development of technologies, empowering end-users and workers, and supporting social innovation.	HUMAN

Cluster 4 – Destinations

Short name	Full name	Topics include:
TWIN-TRANSITION	1. Climate neutral, circular and digitised production	Green, flexible, digital Manufacturing; Construction; Renewable resources, waste
RESILIENCE	2. A digitised, resource-efficient and resilient industry	Materials (raw, green, sustainable); Multi-functional materials, green electronic materials
DATA	3. World leading data and computing technologies	Data, platforms, Cloud to Edge computing, Internet infrastructures
DIGITAL-EMERGING	4. Digital and emerging technologies for competitiveness and fit for the green deal	Electronics, Photonics, low-power processors, AI, 6G, Robotics, Quantum, Graphene
SPACE	5. Strategic autonomy in developing, deploying and using global space-based infrastructures, services, applications and data	Space, Satellite, Observation systems, space services
HUMAN	6. A human-centred and ethical development of digital and industrial technologies	Trustworthy AI, Ethics, Next Generation Internet, digital interaction, digital learning

Cluster 4 – budget distribution

WP2023-24, roughly EUR 2.7 billion programmable budget

Total budget of 15.348 B€ over 2021-2027 (including NGEU)

DESTINATION	BUDGET 2023-2024
Destination 1 ‘Climate neutral, circular and digitised production’	**634.3 M€**
Destination 2 ‘Increased autonomy in key strategic value chains for resilient industry’	**559.2 M€**
Destination 3 ‘World leading data and computing technologies’	**161.0 M€**
Destination 4 ‘Digital and emerging technologies for competitiveness and fit for the green deal’	**461.5 M€**
Destination 5 ‘Open Strategic autonomy in developing, deploying and using global space-based infrastructures, services, applications and data’	**183.8 M€**
Destination 6 ‘A Human-centred and ethical development of digital and industrial technologies’	**317.5 M€**
Other Actions (mostly Space Actions)	**367.1 M€**
Total WP 2023-24	**2709.3 M€**
Key Digital Technologies / Chips JU	**813.0 M€**
EuroHPC JU	**251.2 M€**
Smart Networks and Services JU	**262.2 M€**

European Commission

Cluster 4
Destination 4, WP2023-24

DIGITAL-EMERGING

Sections

- AI, Data and Robotics
- European Leadership in Emerging and Enabling Technologies
- European Innovation Leadership in Photonics
- Graphene and 2D materials: Europe in the lead
- Flagship on Quantum Technologies: a Paradigm Shift
- Open Source for Cloud/Edge and Software Engineering

European Commission

Cluster 4
Destination 4, WP2023-24

DIGITAL-EMERGING

Digital and emerging technologies for competitiveness and fit for the green deal 2023-2024

SECTIONS	NUMBER OF TOPICS 2023	2024	ESTIMATED BUDGET (M€) 2023	2024
AI, Data and Robotics	2	2	60	90
European Leadership in Emerging and Enabling Technologies	2		57	
European Innovation Leadership in Photonics	4	2	60	33
Graphene and 2D materials: Europe in the lead	2	2	18	36
Flagship on Quantum Technologies: a Paradigm Shift	4	2*	42	30
Open Source for Cloud/Edge and Software Engineering		3		35.5
TOTAL WP 2023-2024	14	11	237	224.5

* Excl 25 M€ SGA

https://ec.europa.eu/transparency/comitology-register/core/api/integration/ers/296897/085037/1/attachment

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Topics
Photonics and Emerging, Enabling Technologies

HORIZON-CL4-2023-DIGITAL-EMERGING-01-12	Adaptive multi-scale modelling and characterisation suites from lab to production (RIA)	2023
HORIZON-CL4-2023-DIGITAL-EMERGING-01-51	Pervasive photonics - multi-technology integration for digital infrastructure, sensors and internet of things (RIA)	
HORIZON-CL4-2023-DIGITAL-EMERGING-01-53	Versatile light sources and systems as tools for manufacturing and medical application (RIA)	
HORIZON-CL4-2023-DIGITAL-EMERGING-01-57	Advanced imaging and sensing technologies (IA)	
HORIZON-CL4-2023-DIGITAL-EMERGING-01-11	Low TRL research in micro-electronics and integration technologies for industrial solutions (RIA)	
HORIZON-CL4-2023-DIGITAL-EMERGING-01-56	Photonic Strategies and Skills Development (CSA)	
HORIZON-CL4-2024-DIGITAL-EMERGING-01-54	Smart photonics for joint communication & sensing and access everywhere (RIA)	2024
HORIZON-CL4-2024-DIGITAL-EMERGING-01-55	Photonics Innovation Factory for Europe (IA)	

https://ec.europa.eu/transparency/comitology-register/core/api/integration/ers/296897/085037/1/attachment

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Cluster 4

Calls in Photonics and Emerging, Enabling Technologies

HORIZON-CL4-2023-DIGITAL-EMERGING-01

European leadership in Emerging Enabling Technologies

-12: Adaptive multi-scale modelling and characterisation suites from lab to production (RIA)

European Innovation Leadership in Photonics

-51: Pervasive photonics - multi-technology integration for digital infrastructure, sensors and internet of things (Photonics partnership)(RIA)
-53: Versatile light sources and systems as tools for manufacturing and medical application (Photonics Partnership) (RIA)
-57: Advanced imaging and sensing technologies (IA)(Photonics Partnership)

	ToA	Budget (M€)	EU contribution (M€)	Nr of projects	Call period
-12	RIA	22	5-7	4	1 Dec 22 to 29 Mar 2023
-51	RIA	18	3-5	4	1 Dec 22 to 29 Mar 2023
-53	RIA	18	3-5	4	1 Dec 22 to 29 Mar 2023
-57	FPA	18	3-5	4	1 Dec 22 to 29 Mar 2023

HORIZON-CL4-2023-DIGITAL-EMERGING-01-CNECT

European leadership in Emerging Enabling Technologies

-11: Low TRL research in micro-electronics and integration technologies for industrial solutions (RIA)

European Innovation Leadership in Photonics

-56: Photonic Strategies and Skills Development (CSA) (Photonics Partnership)

	ToA	Budget (M€)	EU contribution (M€)	Nr of projects	Call period
-11	RIA	35	3-4	10	1 Dec 22 to 29 Mar 2023
-56	CSA	4	1-3	2	1 Dec 22 to 29 Mar 2023

HORIZON-CL4-2024-DIGITAL-EMERGING-01

European Innovation Leadership in Photonics

-54: Smart photonics for joint communication & sensing and access everywhere (Photonics Partnership) (RIA)
-55: Photonics Innovation Factory for Europe (Photonics Partnership) (IA)

	ToA	Budget (M€)	EU contribution (M€)	Nr of projects	Call period
-54	RIA	18	3-5	4	15 Nov 23 to 19 Mar 24
-55	IA	15	± 15	1	15 Nov 23 to 19 Mar 24

Other relevant topics?

Example:

- **HORIZON-CL4-2023-RESILIENCE-01-33: Smart sensors for the Electronic Appliances market (RIA)**

Have a look at other parts of Horizon Europe!

https://ec.europa.eu/transparency/comitology-register/core/api/integration/ers/296897/085037/1/attachment

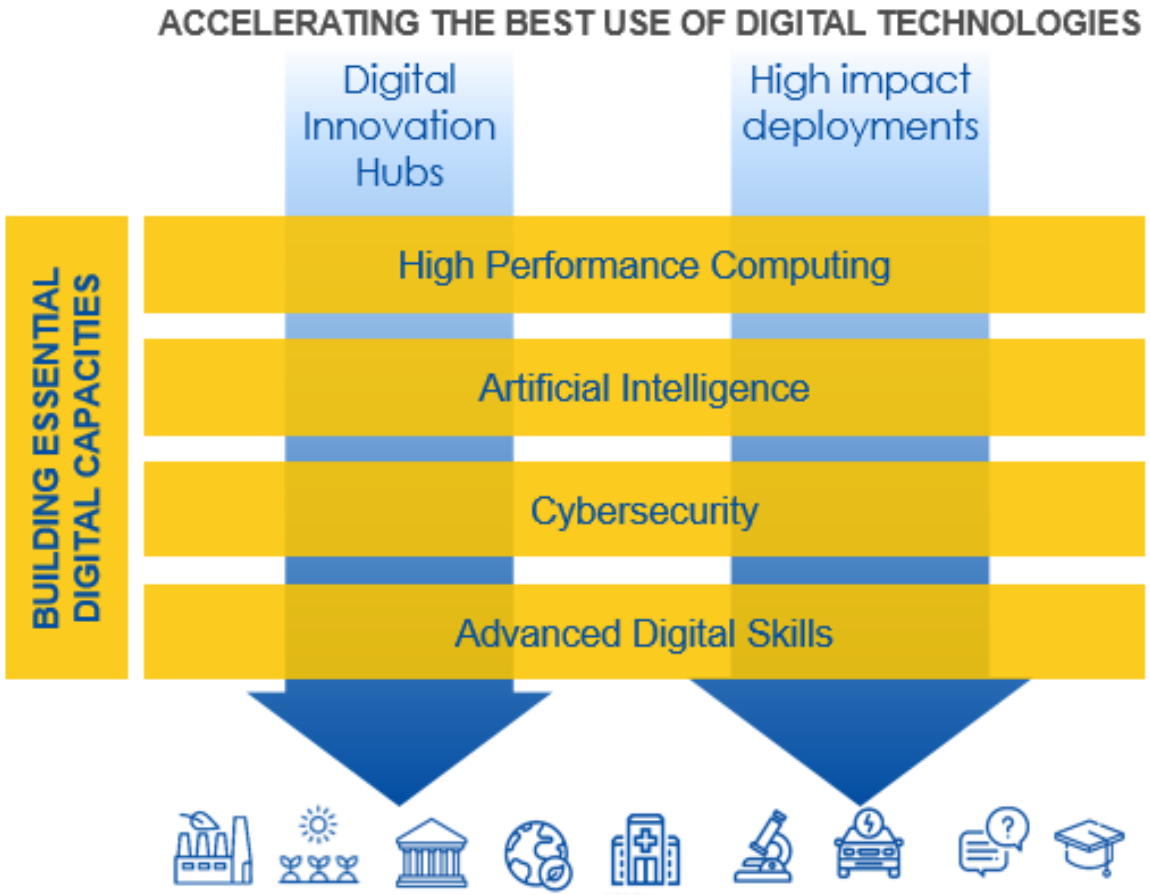
Digital Europe Programme

To **ensure that Europe drives the digital transformation** of the economy and society and brings its benefits to all citizens and businesses.

Focus on:

- Building **essential capacities and advanced skills** in digital technologies, contributing to **Europe's strategic autonomy**;

- **Accelerating deployment** and best use in areas of public interest and the private sector



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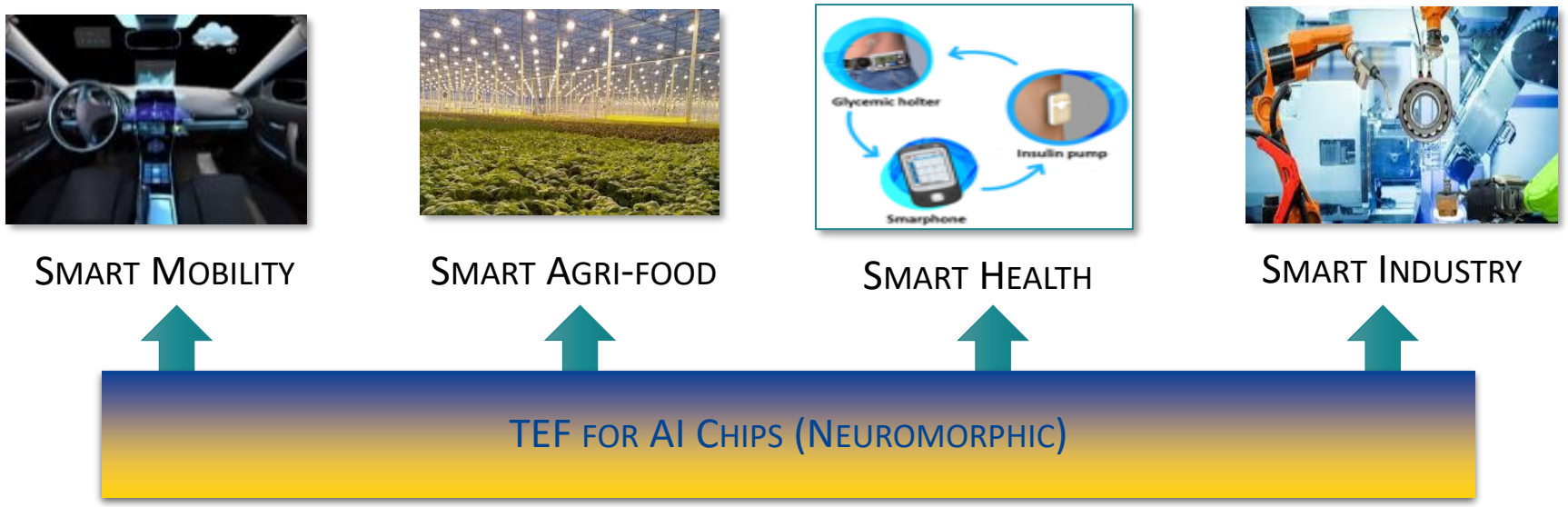
Digital Europe Programme

Testing and Experimentation Facility for Edge AI & Skills



Specialised education programmes or modules in key capacity areas

- Includes “Microelectronics”
- Total: EUR 56 million, max EUR 10 million per grant
- Submission deadline: 24 January 2023

European Commission

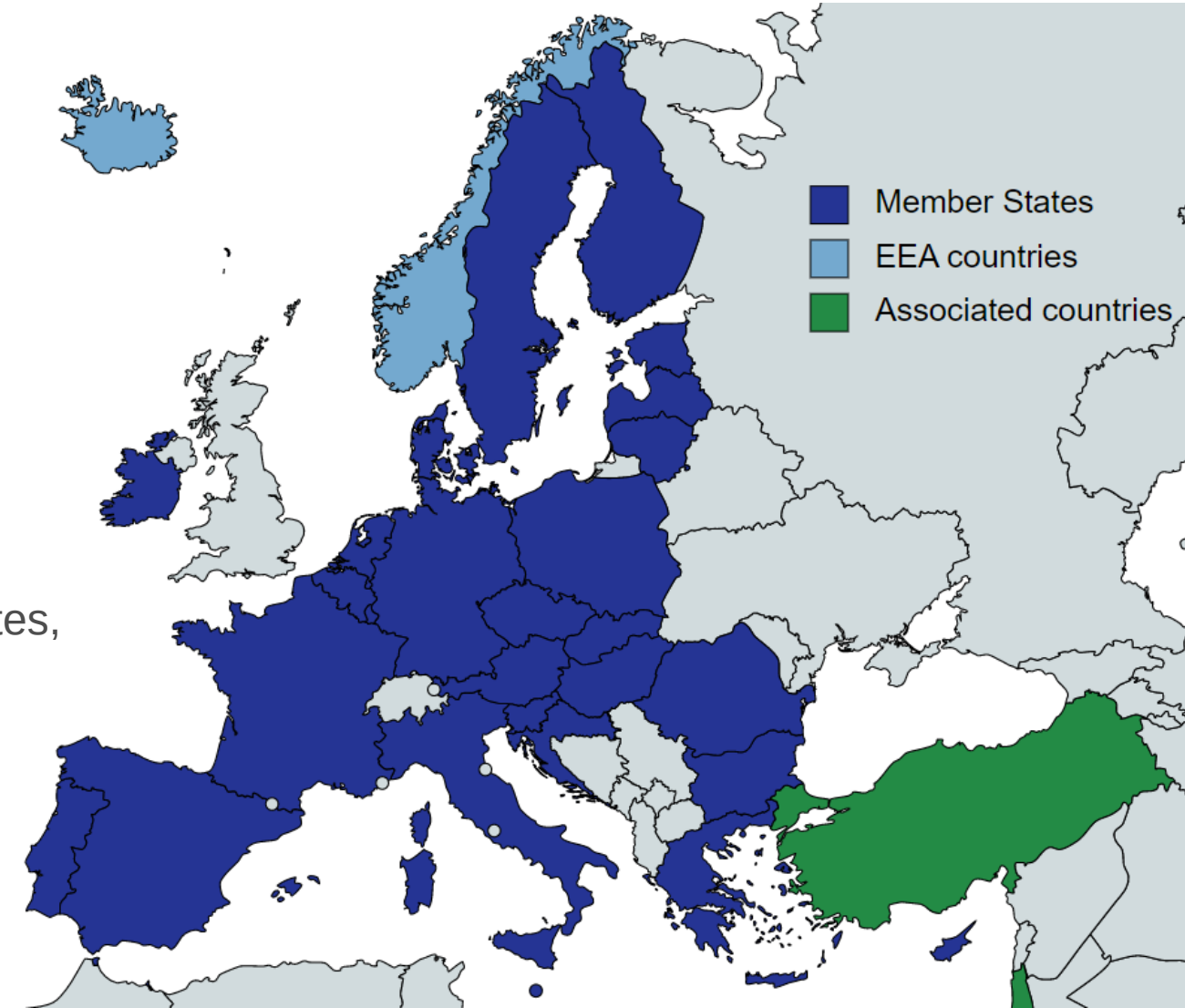
https://ec.europa.eu/info/funding-tenders/opportunities/portal/screen/opportunities/topic-details/digital-2022-skills-03-specialised-edu

Key Digital Technologies Joint Undertaking

- Reinforce EU's digital sovereignty in **electronic components and systems**
- Support future needs of vertical industries and economy at large

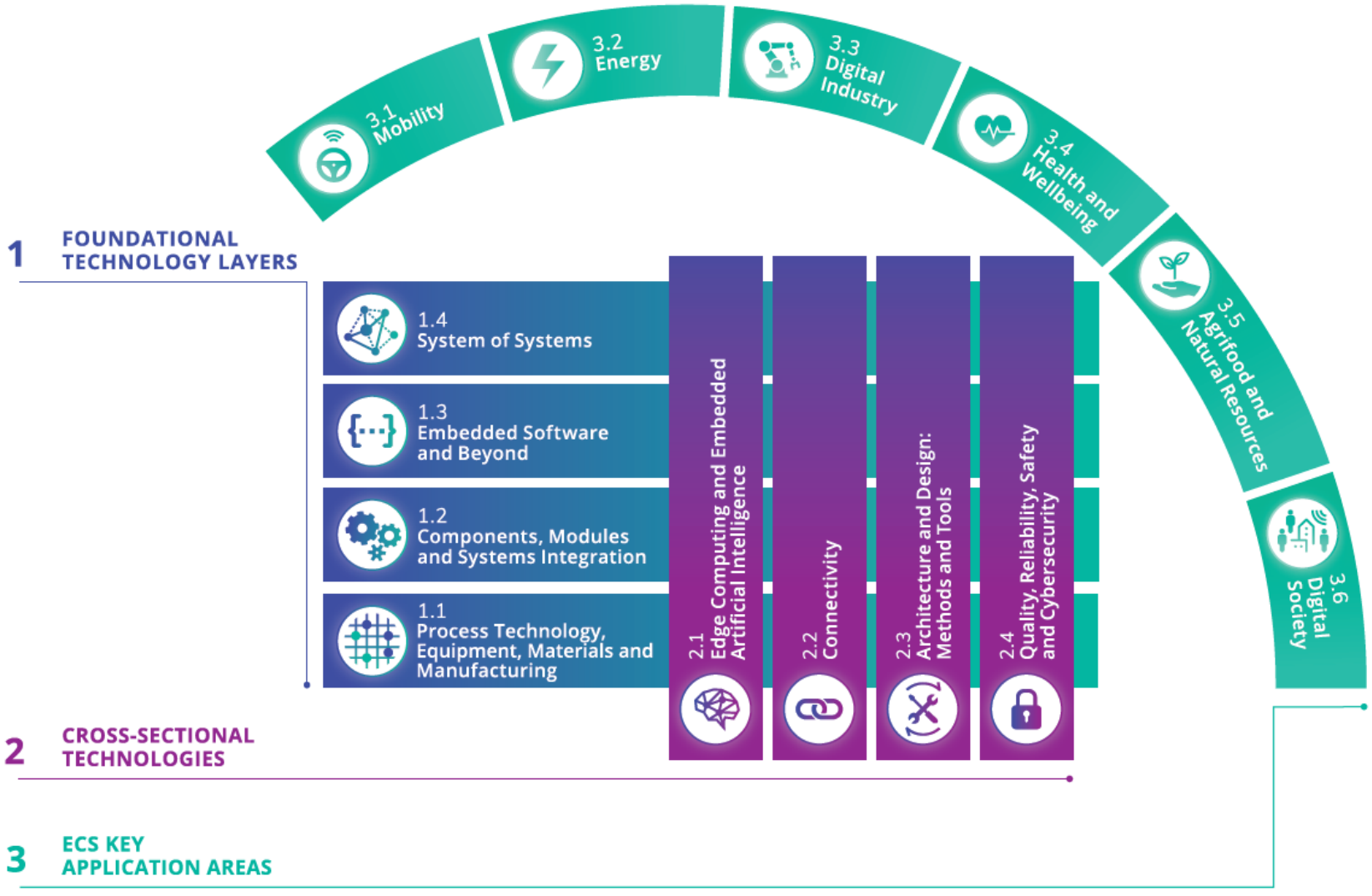
31 Participating States,
3 industry associations

EUR 1.8 billion from Union,
+ commensurate contribution Participating States,
+ in-kind contribution private side,
for 2021-2027



https://www.kdt-ju.europa.eu/

Key Digital Technologies Joint Undertaking
ECS SRIA



See ECS SRIA 2022, https://www.kdt-ju.europa.eu/sites/default/files/users/ecsel-comm-team/ECS-SRIA-2022.pdf

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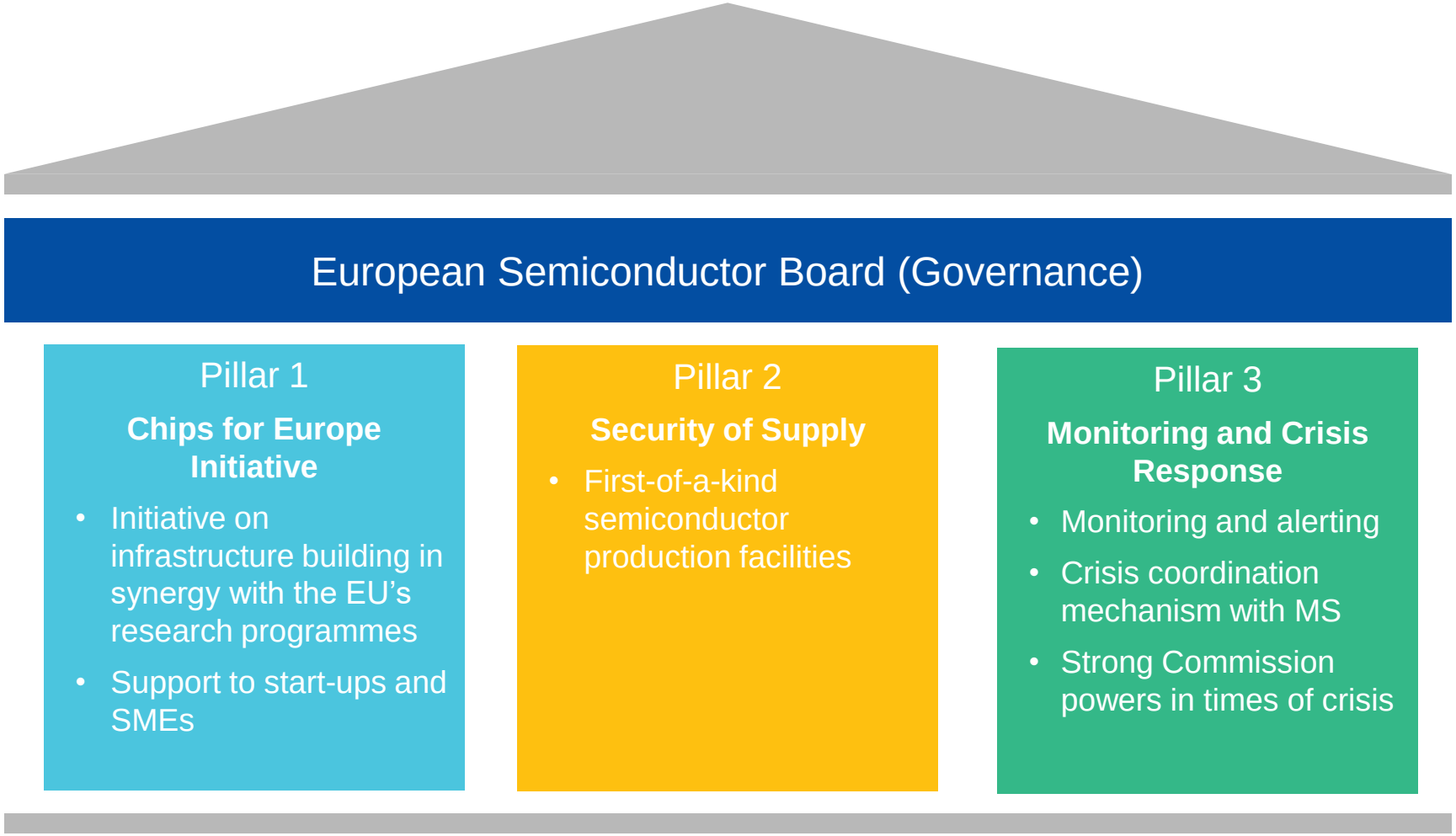
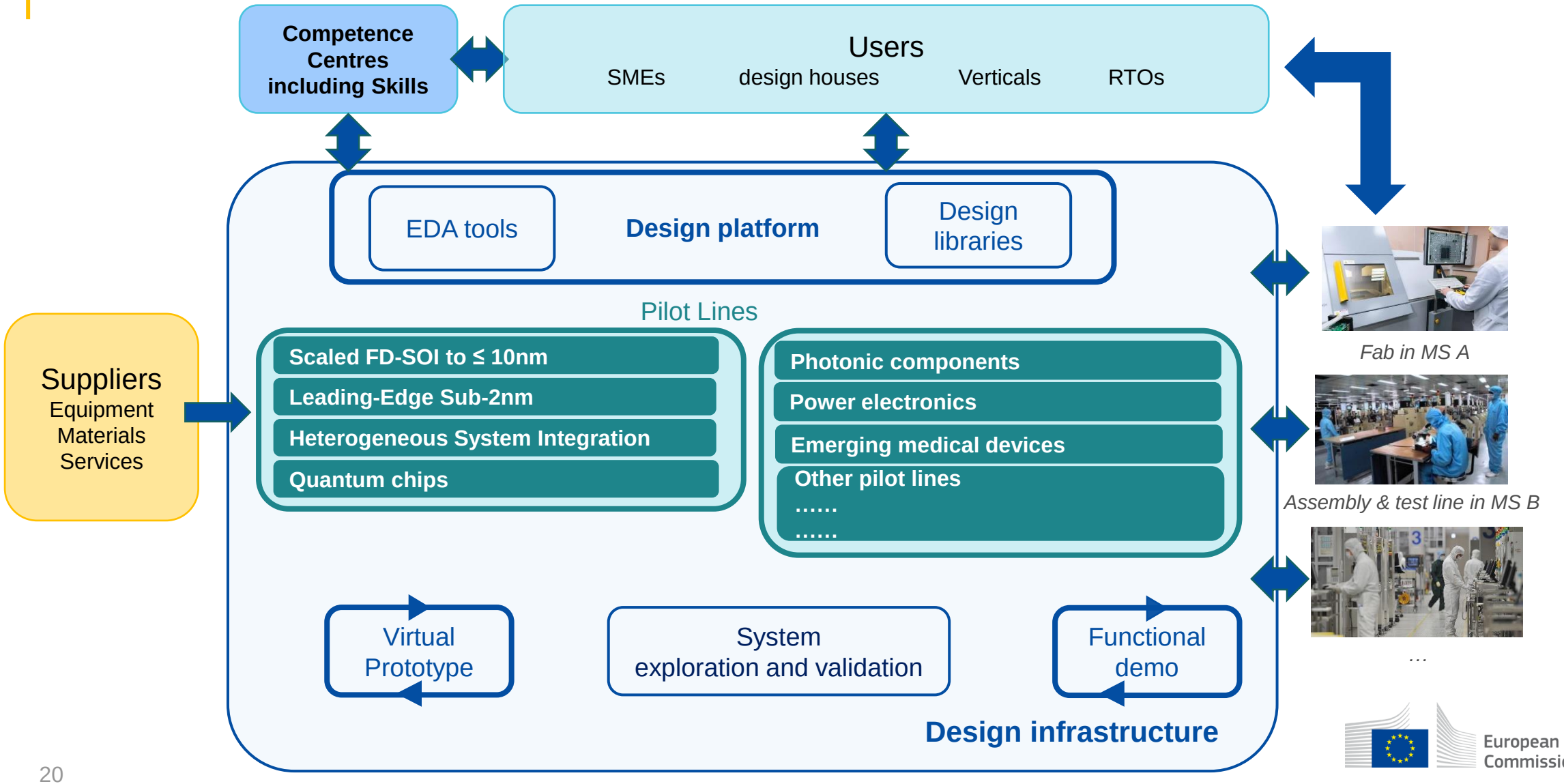
KDT Work Programme 2023
Topics under discussion

- 6G Integrated Radio Front-End for TeraHertz Communications (IA)
- Electronic Control Systems (ECS) for management & control of decentralized energy supply & storage (IA)
- Integration of trustworthy Edge AI technologies in complex heterogeneous components and systems (IA)
- Hardware abstraction layer for a European Vehicle Operating System (RIA)
- Improving the global demand supply forecast of the semiconductor supply chain (IA)
- Pan-European network for Advanced Packaging made in Europe (CSA)

Chips Act
Three pillars



From the lab to the fab



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Examples of projects foreseen

R&I and cap building to be supported by EU, MS, and industry

- **Pilot lines**
  - Energy-efficient FDSOI 10 nm and below
  - Leading edge nodes
  - Heterogeneous Integration
  - Photonics pilot lines
  - …
- **Quantum Chips**
  - Pilot lines / design platform
- **Design platform**
  - Development and Operation
  - Design for specialty chips
  - Security by design
  - RISC-V
  - …
- **Competence centres**
  - Centres
  - Skills
- **Additional R&I**
  - Energy
  - Car of the Future
  - Defence/aeronautics
  - Health
  - Communications

Technologies

  - Trusted chips (CRA)
  - AI chips
  - New OSs and processors
  - …
  - Bottom up part

European Commission

Chips Act workshops: past and upcoming

Date	Location	Workshop title
September 13-14, 2022	**EC**	Pilot Lines and Design Platform
September 29	Online	*Chips for Europe* Initiative (pillar 1)
November 22	Online	*Chips Act for startups and SMEs*
November 30	Warsaw + online	Competence Centres (co-organised with PL)
December 2	EC (Copernicus)	*How to Reverse the Semiconductors Skills Shortage?*
Jan/Feb 2023	tbc	Trusted Chips

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For more information

- Cluster 4 Info Days on 12-14 December 2022:
- https://research-innovation-community.ec.europa.eu/events/3jM2kV6qwHjteovSf3VOrp/overview

- Participants portal - Funding & tender opportunities:
- Funding & tenders (europa.eu)

- Key Digital Technologies Joint Undertaking
- https://www.kdt-ju.europa.eu/

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Thank you for your attention!

Any questions?