

Challenges in Advanced Computing and Functionalities International Cooperation on Semiconductors

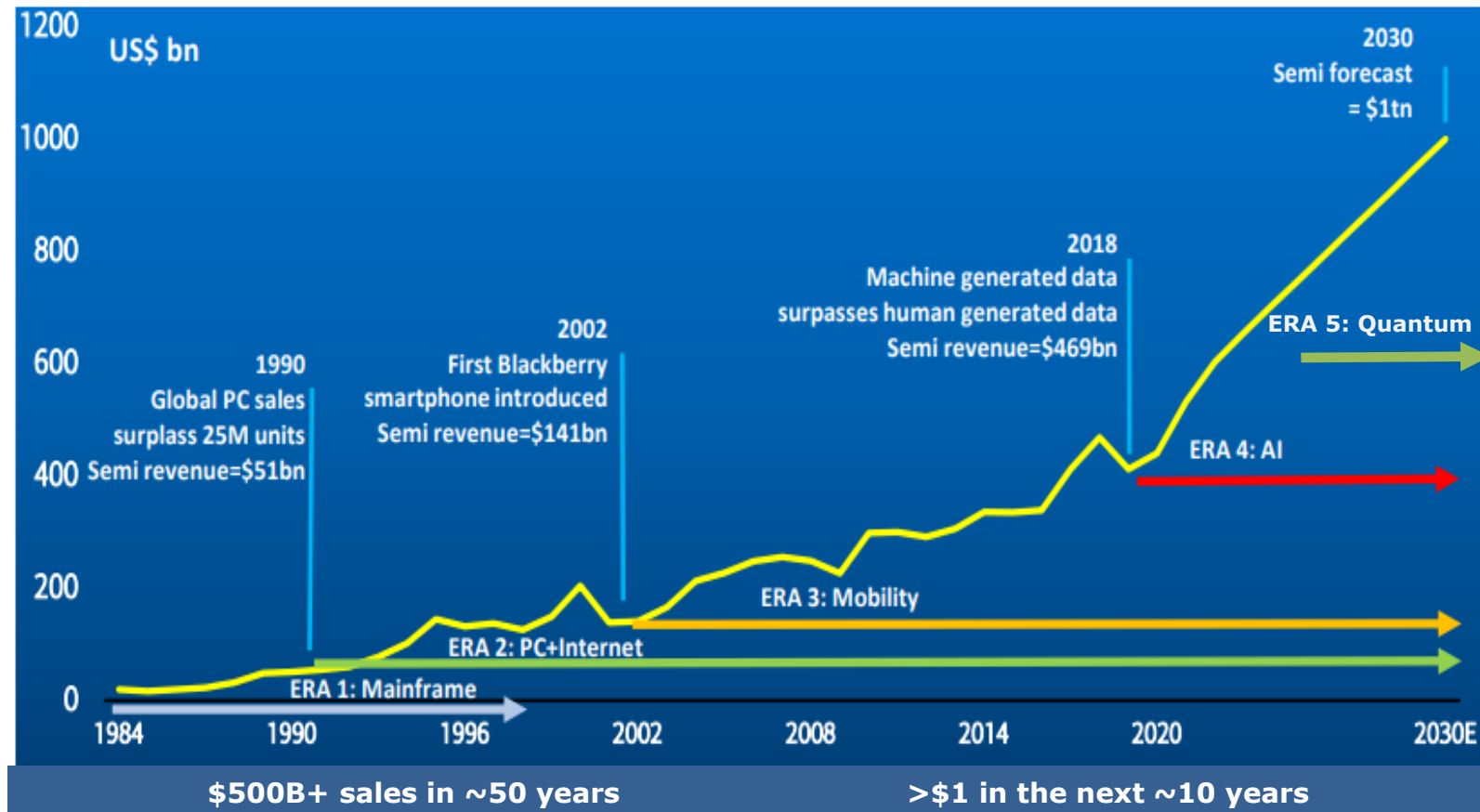
The European Chips Skills Academy Project
Assessing the Chips skills gap and defining mechanisms to address it

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Semiconductors – Entering a new expansion era

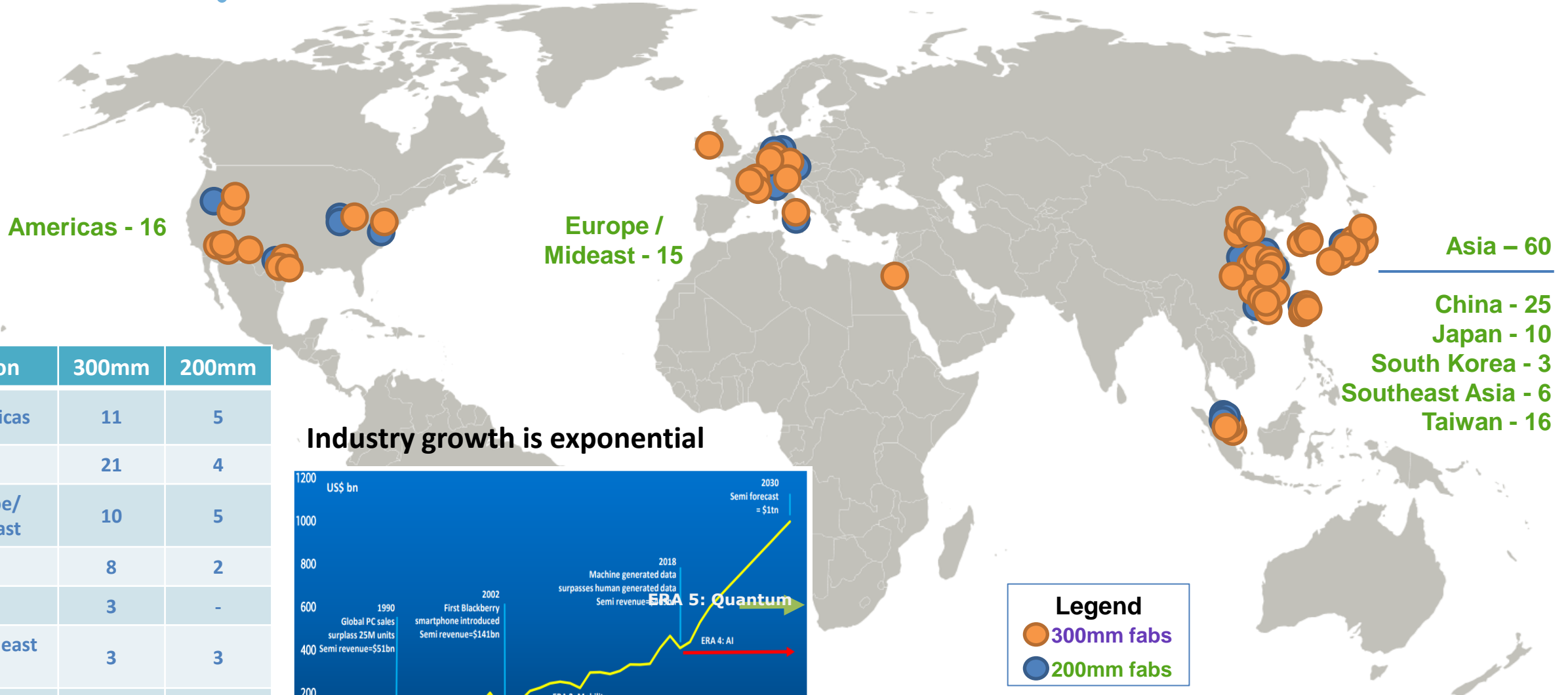
Industry growth is exponential



Sources: Bank of America, SEMI

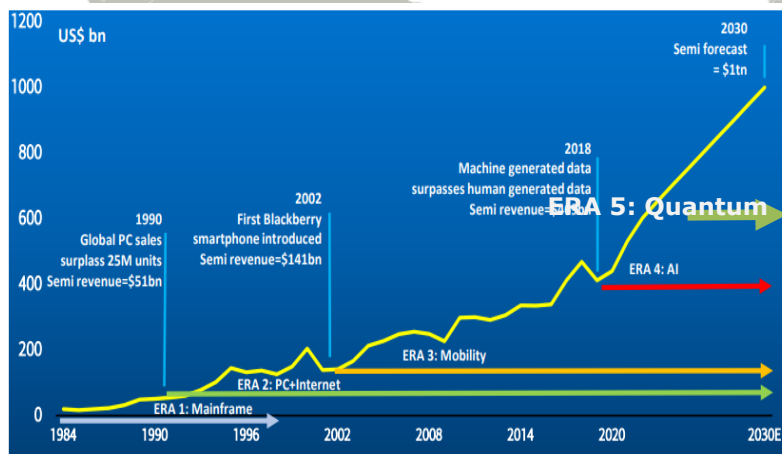
Unprecedented Capacity Expansion Underway

91 200mm and 300mm new fabs & expansions between 2022 to 2026*



Region	300mm	200mm
Americas	11	5
China	21	4
Europe/ Mideast	10	5
Japan	8	2
Korea	3	-
Southeast Asia	3	3
Taiwan	15	1
Total:	71	20

Industry growth is exponential



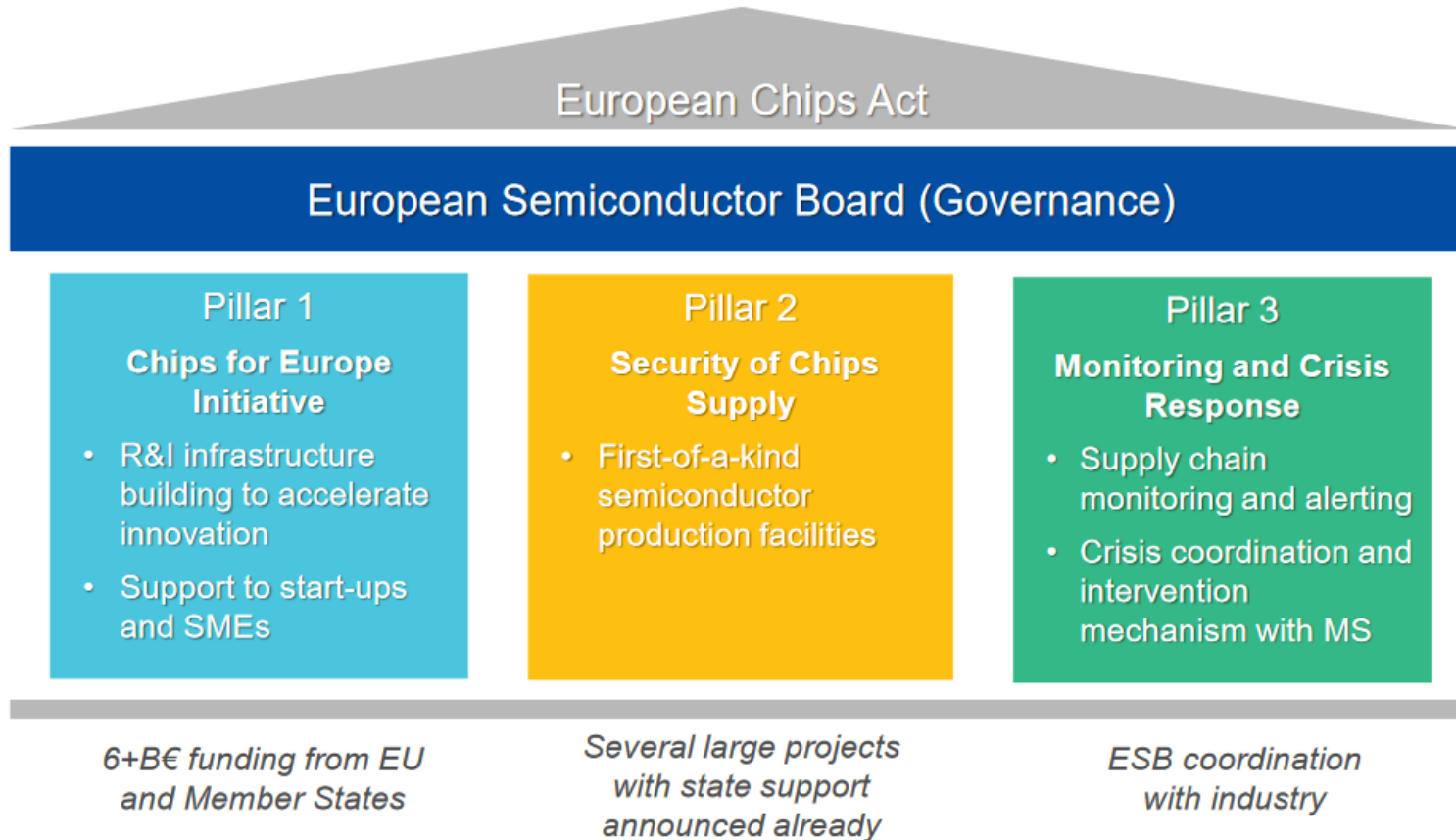
Legend

- Orange circle: 300mm fabs
- Blue circle: 200mm fabs

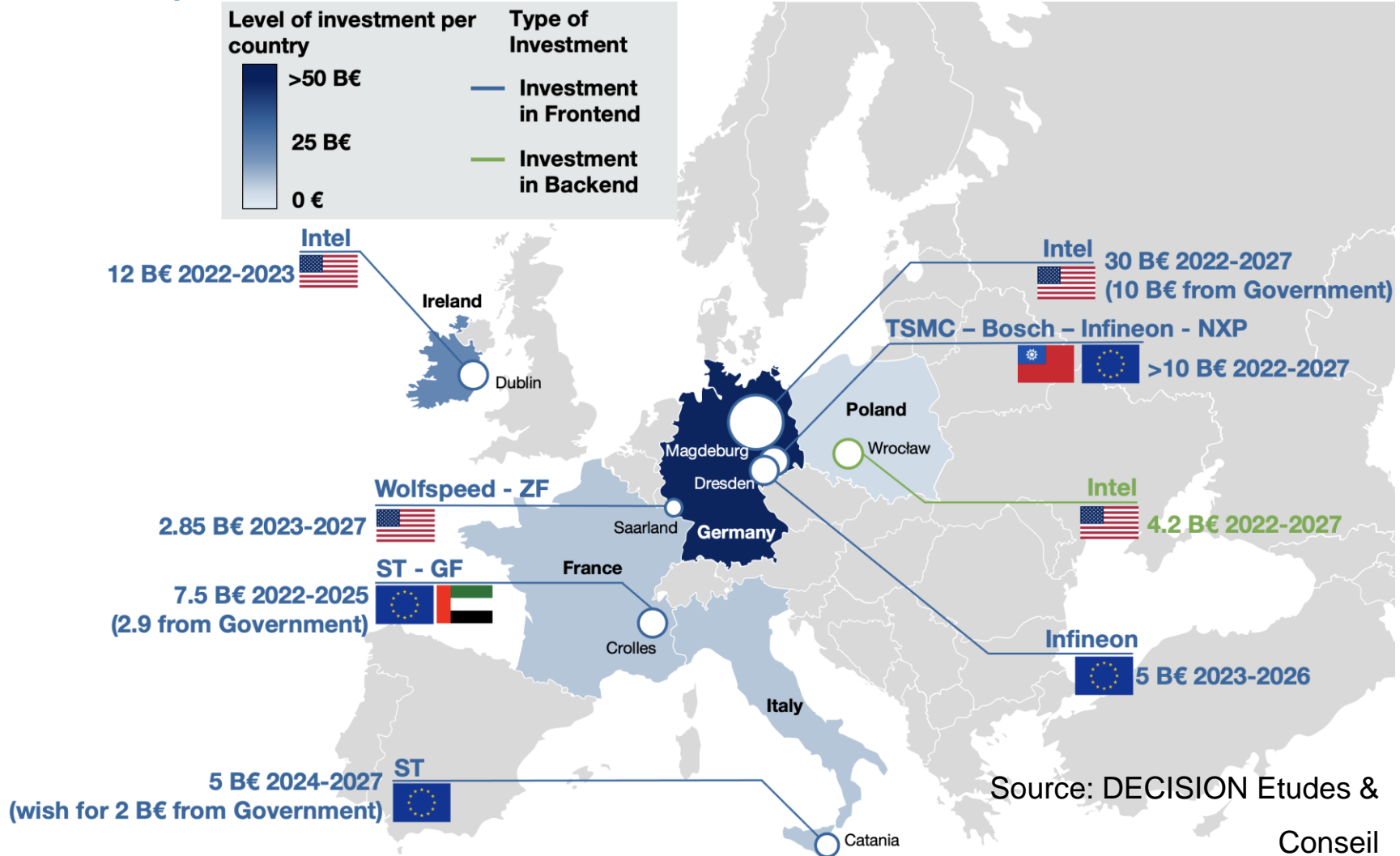
The EU Chips Act - 3 pillars

EU Chips Act entered into force in September 2023

Objective: mobilize by 2030 over €43 billion in public investments aiming to double EU's global market share



Key investments in the EU



➤ 58% of investments from US companies

Talent Gap in the European Semiconductor Industry

- Additional 200,000 staff needed to reach EU Chips Act ambitions (20% global market share) and enable a total workforce of 510,000 by 2030*.
- A variety of backgrounds are needed: Software Developers, Engineers, but also Operators and Technicians – positions which are in decline.
- Diversity enlarges the talent pool: the industry must collectively address the topic of diversity; currently women make up 20 to 25% of the global semiconductor workforce.
- Barriers to EU mobility must be lowered to attract qualified candidates from abroad.

Source: DECISION Etudes & Conseil, European Chips Skills Academy

European Chips Skills Academy

At a glance:

- **Objective:** Create an **Alliance** between educational systems and the microelectronics industry to develop a decentralized **Academy** to meet the growing demands for skills.
- **Funding:** 4 M €
- **Duration:** 4 years - Oct. 2023 to Sep. 2027
- 18 Consortium Members + Associate Partners
- Quantify the **skills gap** to better understand the current and upcoming needs of the sector.



01 INNOVATE

Develop innovative approaches and cooperation among education and industry for concrete skills development

01

02

INTEGRATE

Bridge the gap between VET, HE and industry for the emerging occupational profiles and renewed skills



03 IMPLEMENT

Operationalize skills intelligence to ensure education and training programs keep pace with industry needs

03



Meet the partners

Industry



European Chip Skills Academy

Research & Innovation



Accreditation



Social Partner



Higher Education & Training



Our mission



European Chips Skills Alliance

Network building and cross-discipline dialogue



ECS-Academy

Specialized training, courses, internships, summer school etc.



ESCA E-learning platform

Tailored pathways for individual career development

Underpinned by robust skills intelligence: Quantify skills gap, monitor trends...

Methodology to assess the skills gap in 2024

1. Market analysis from DECISION Etudes & Conseil

- Tools: Statistics on graduates, company financials, custom databases...
- Results: National & cluster's level assessment of the workforce and talent gap, forecasts

2. Online survey

- Answered by experts from the EU industry (316 consulted since 2020).
- Results: Job profiles and skills the most needed and difficult to find, policy recommendations...

3. Connection with Member States

- Collect and analysis of existing national and regional reports and initiatives

Results to be published in a report in October 2024

The EU semiconductor workforce – Overview

Value chain	Workforce in the EU27 in 2022	%
Semiconductors	161 000	53%
Materials & tools	118 000	39%
RTOs	27 000	9%
Microelectronics (total)	306 000	100%

TOP 3 EMPLOYERS in the EU27 in 2023



25 717 employees



23 065 employees



21 072 employees

Source: DECISION, Eurostat, company annual reports

11% growth of employment in the EU27 in 2022

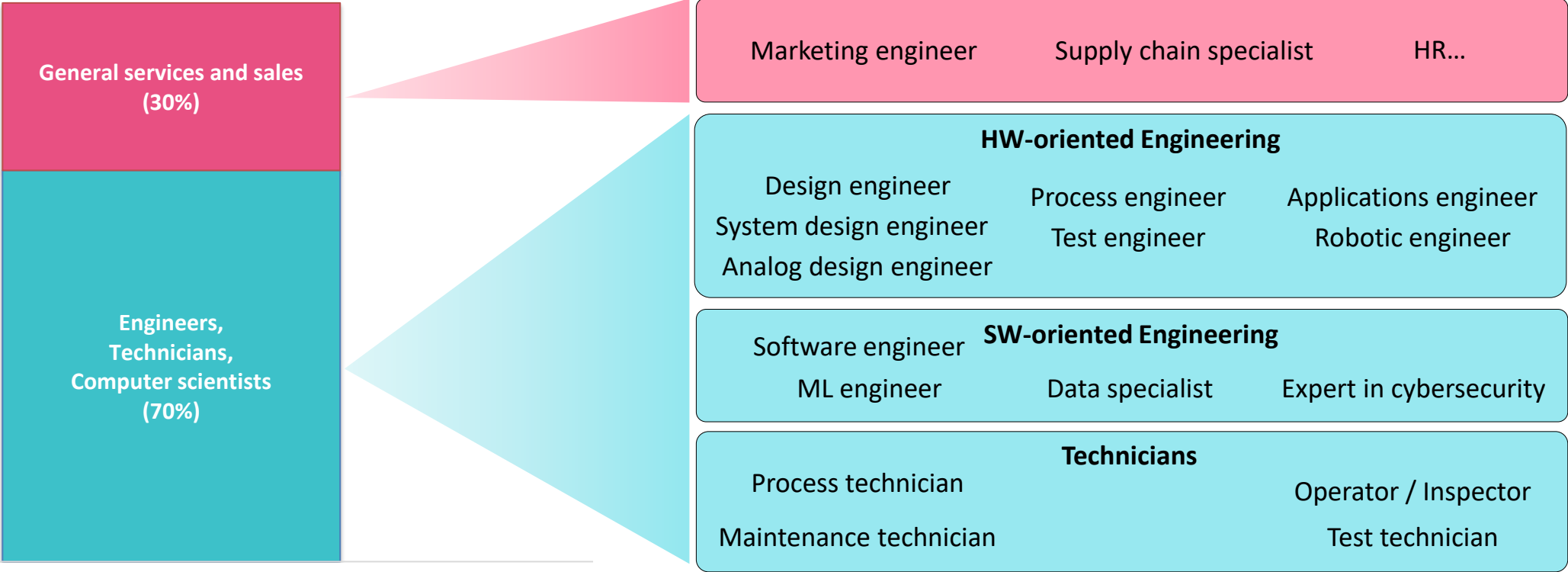
+ 30 000 hires in 2022

Considering the entire electronics value chain (passive components, electronic boards, systems)

2 720 000 employees are located in the EU

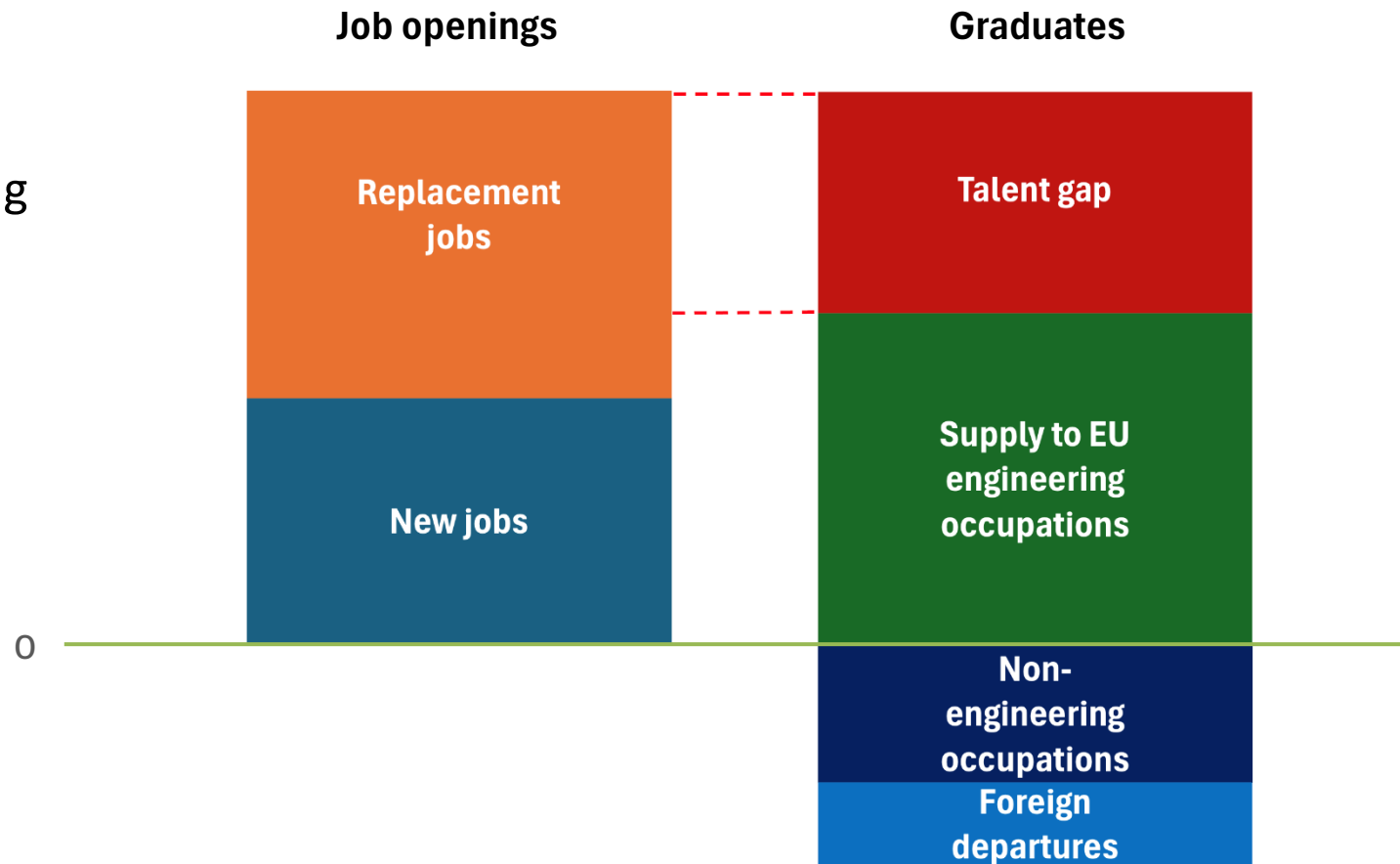
A wide range of occupations

More than 300 000 jobs in 2023

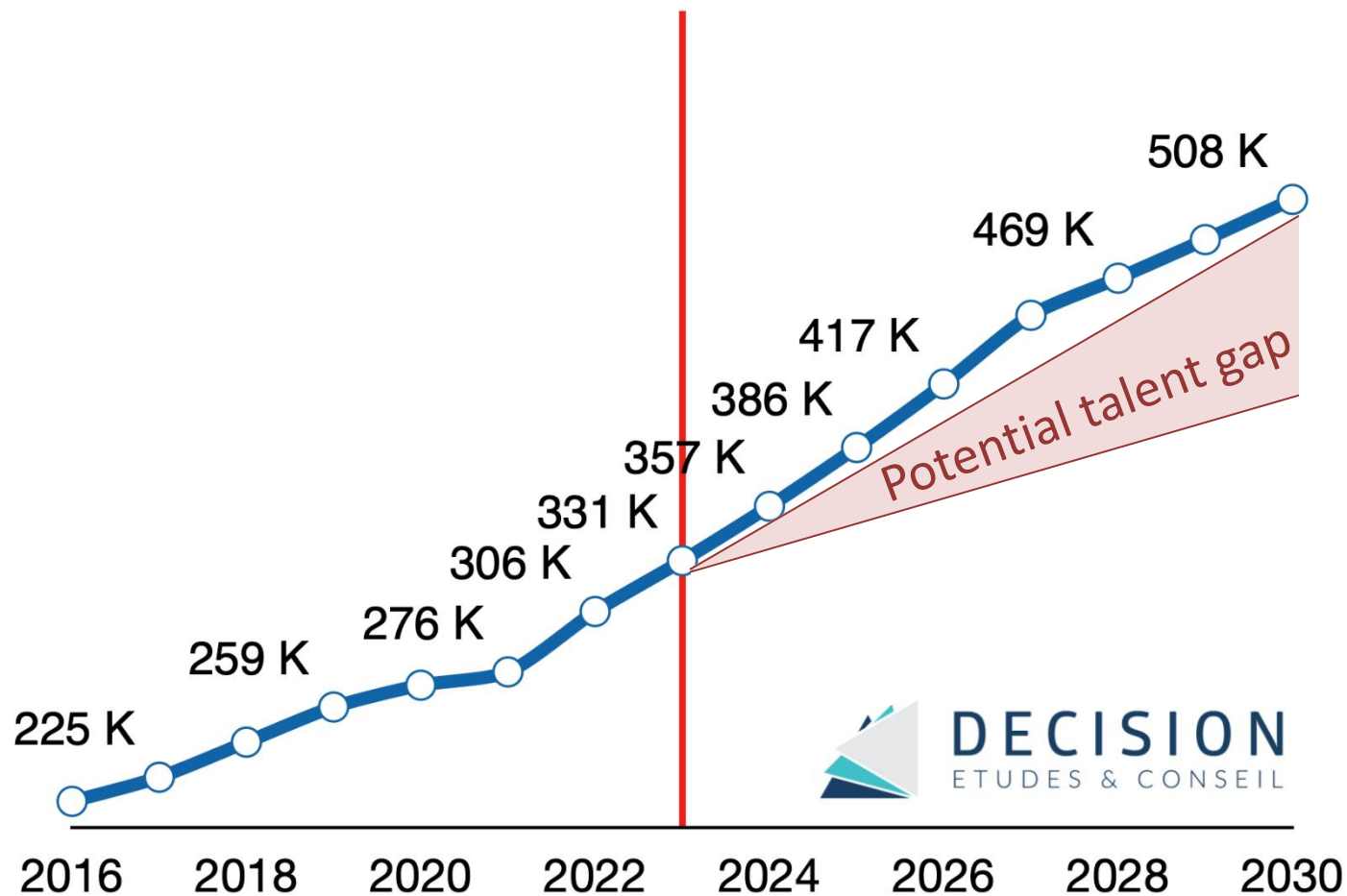


Quantitative analyses : estimating the talent gap (2024-2030)

Example for engineering



EU Semiconductor workforce 2016-2022 and forecasts 2022-2030



- 2016-2021 period: +5,4%/year for the EU semiconductor workforce
- 2021: Only 2% growth due to the COVID crisis.
- 2022-2030 period: expected 6,5%/year
 - Boosted by EU Chips Act and the numerous investment plans.
- 2022 to 2030:
 - + 200 000 employees
 - EU workforce multiplied by 1,7.

Our approach since 2020



3 reports on semiconductor skills needs in the EU

[Report “Skills and Occupational Profiles for Microelectronics” 2021](#)



[METIS Skills Strategy 2021](#)



[Yearly Monitoring Report 2023](#)



[Slide deck final results 2023](#)

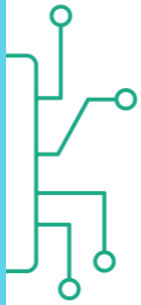


Challenges faced by the semiconductor industry

- Shortage of specific senior profiles that requires 5-10 years of experience to train
 - Systems designers, analog designers, senior application engineers...
- Competition with foreign countries to attract talent (US, Asia)
- Competition with other industries to attract talents
(e.g., data specialists hired in every industries and services)

Opportunities for the semiconductor industry

- Short run: Intra-EU migration from Member States with excess training capacities
- Short run: Reskilling from other EU industries (automotive...)
- Short run: Attracting talents from abroad (India, south Asia...)
- Long run: Adjusting the initial training offer in the EU, on a cluster's level



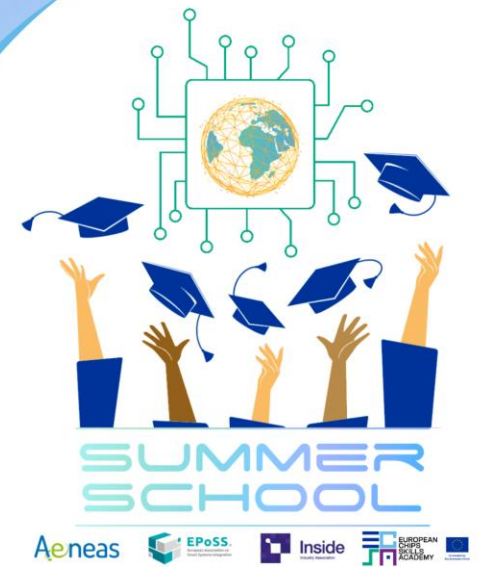
Electronics Components and Systems Summer School



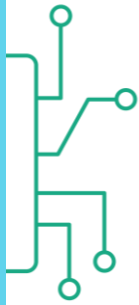
- Why ? Inspiring the young generation to become professionals in the ECS ecosystem
- What ? **Motivating** lectures and demonstrations from industry and RTO's professionals covering **the whole spectrum** of the ECS value chain, organized by AENEAS, EPoSS and Inside with ECSA support
- Key messages
 - ECS are **cool**
 - Very diverse field, with lots to be invented still
 - They change the way we live and are at the heart of a sustainable future
 - **You** can make a difference
- **What's in for students ?**
 - Better understand their opportunities
 - Meet fellow students from all over Europe
 - Exchange with industry professionals and academic researchers
 - Great location and Fully Funded Educational Journey

FASCINATING ELECTRONICS FOR A COOL WORLD!

18 - 23 August, 2024
Bertinoro, Italy



- Inviting selected students to get an understanding of the diversity of the activities offered by the ECS domain
 - 40 students, gender balance
 - Eligible: STEM undergraduate programmes, one year before last (mostly after 2 years of Bachelor)
 - 5-day programme
 - Talks covering Technology, IC design, Integration and Digital systems
 - Demonstrators and hands-on activities
 - Debates
 - Career testimonies
 - Social activities
 - Castle and village tour, winery tour and gala dinner



Four main topics



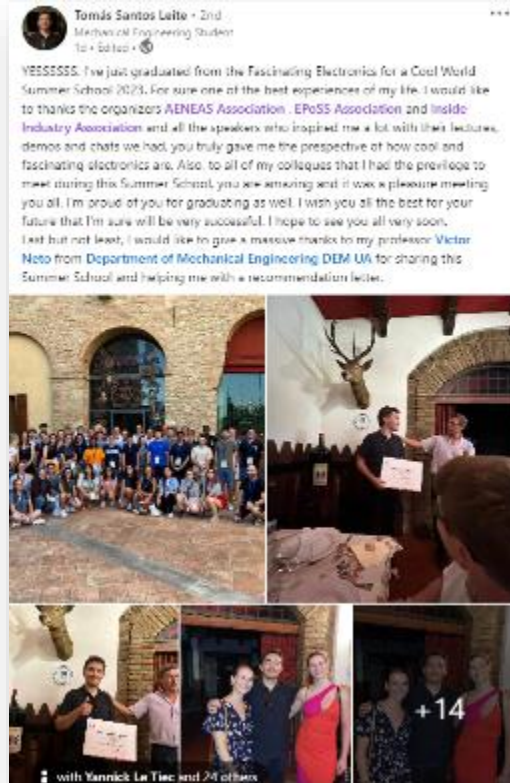
- Technology overview of the evolution of the chip industry since its birth towards the on-going development of quantum technologies. Main processing steps for manufacturing various semiconductor devices. Also addressed the reduction of the carbon footprint of the information and communication technology sector.
- Integrated Circuits design - Covered the challenges to be met when designing the various flavours of Integrated Circuits: Digital, Sensors, Microwaves... Starting with a testimony by Bruno Murari, one of the pioneers of the industry and the father of the MEMS now present in all aspects of our digital life.
- Integration - Truly smart systems need to be integrated. This day covered the techniques and architectures that allow reuniting all the necessary heterogenous components in a compact package that keeps the system protected and functional, managing excess heat for instance in power electronics or enduring harsh environments such as space.
- Digital systems - Technological trends currently being developed in the area of “Digital Systems and Embedded Intelligence”. Topics included Embedded AI, Real-Time embedded Software, and Edge to Cloud Communication. Applications of those technologies in areas like digital industries, the automotive sector, and for novel approaches of producing our daily food.

From 2023 Edition Buzz on social media

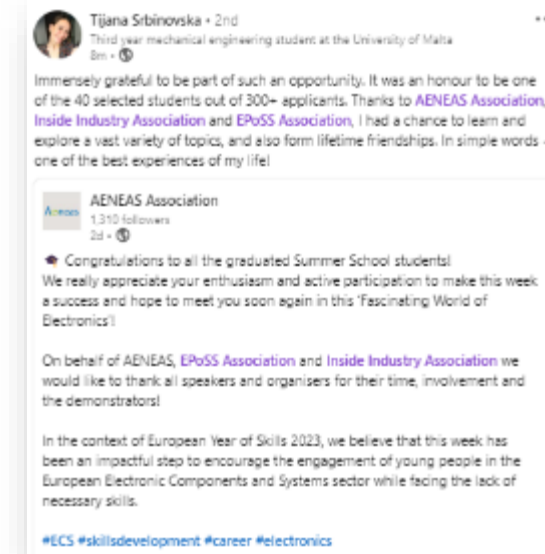


« I'm incredibly grateful... »

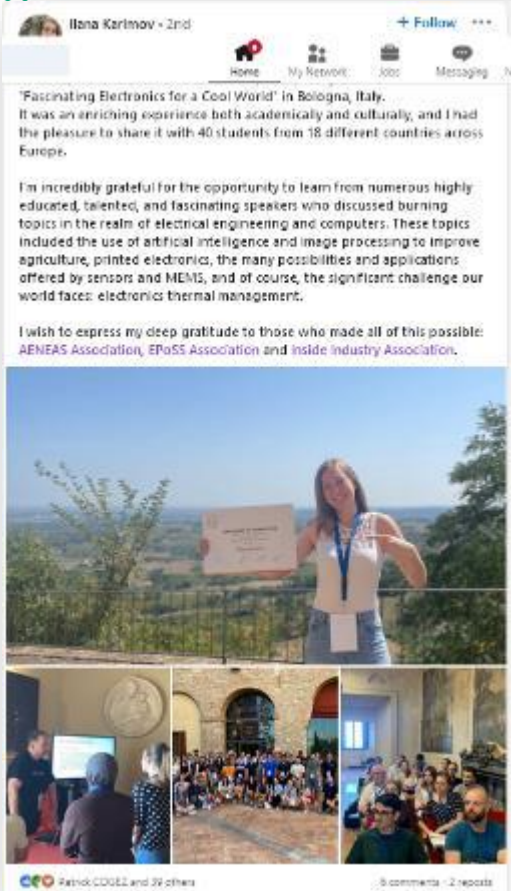
«All the speakers who inspired me a lot..You truly gave me the perspective of how cool and fascinating electronics is... »

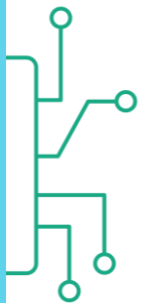


«Immensely grateful ...» I had a chance to learn and explore a vast variety of topics, and also form lifetime friendships. In simple words – one of the best experiences of my life! »



“This week, I had the incredible opportunity to be among the 40 selected students to participate... We learned many things related to microelectronics, IoT and artificial intelligence from 32 experts on the field, aiming to advance European technology »





Still time to apply !

<https://chipsacademy.eu/summer-school/>

18 – 23 AUGUST
2024

APPLY NOW!



FREE SUMMER SCHOOL

FASCINATING ELECTRONICS FOR A COOL WORLD

Apply now for a **free Summer School** in Italy and benefit from this unique opportunity. Learn how you can contribute and make Europe a better place!

This event is located at University Residential Centre Bertinoro, near Bologna, Italy and is supported by key European universities and research institutes.

APPLY BY 19 MAY 17:00 CEST

The road ahead



Work Based Learning to combine practice with theory



Internship models at various stages of the education path – complementing WBL



Placement/career development paths which define mechanisms for transition from education to work



Online and physical curricula to upskill/reskill workers using microcredentials



Professorship guidelines to expand teaching opportunities

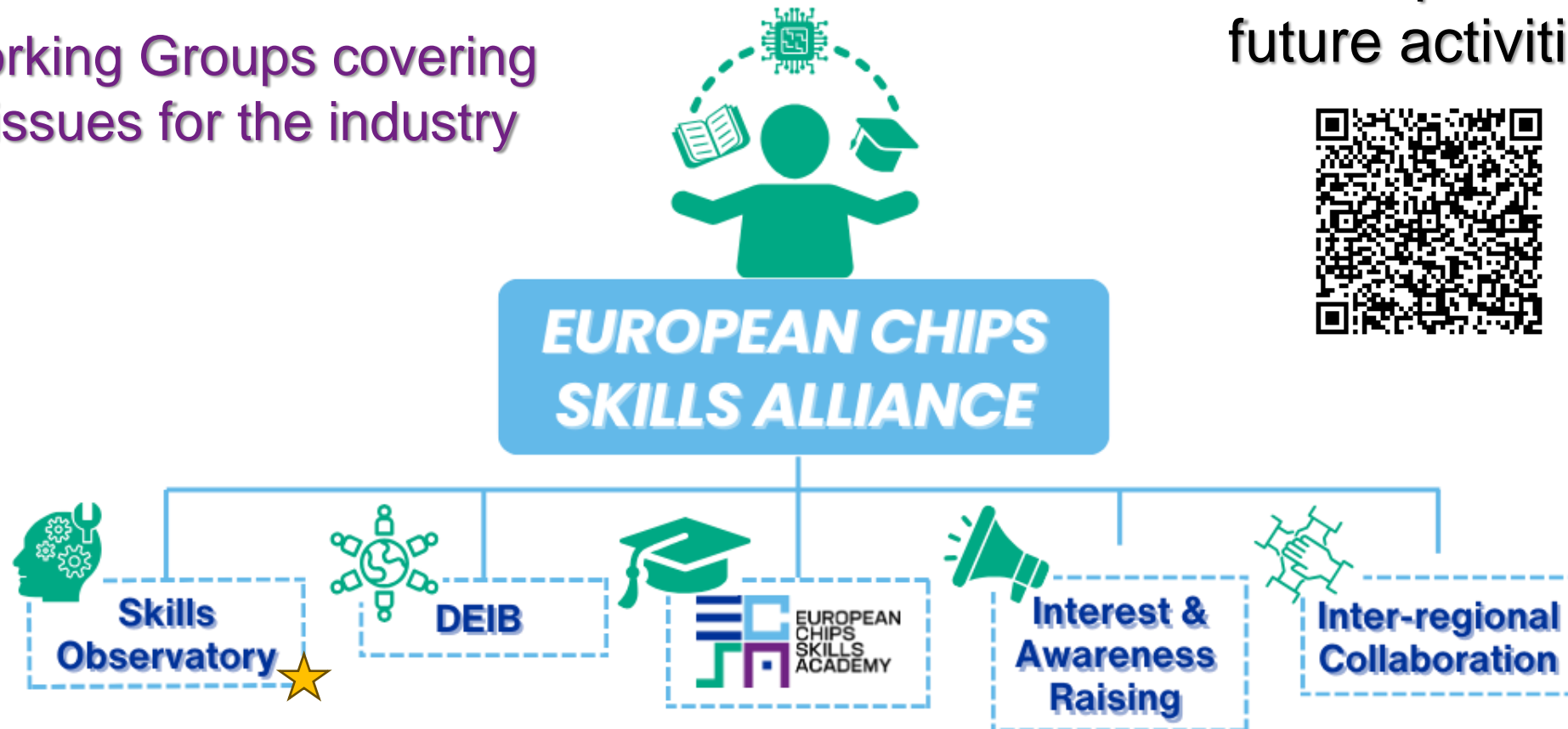


Summer schools and other structured learning programs

The Alliance

5 Working Groups covering
top issues for the industry

Be a part of
future activities





THANK YOU!

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ICOS WORKSHOP – May 13-14th 2024, Athens

icos-semiconductors.eu