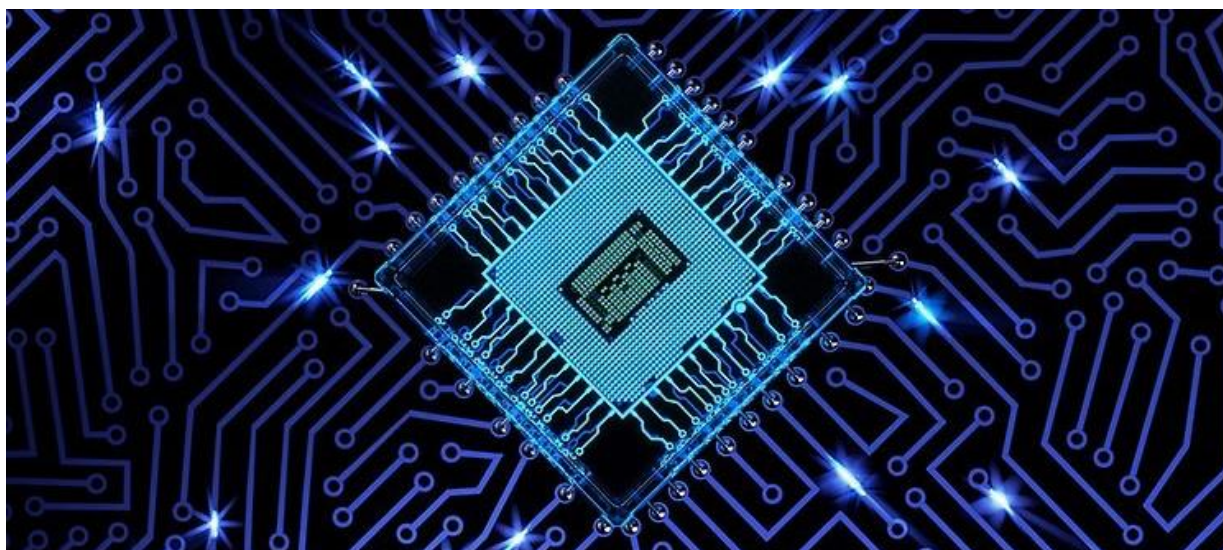




European Chips Skills 2030 Academy

Full Plan

A European Industry, University and Training Network to address the skills shortage, attract new talent, and support the emergence of a skilled workforce



A vision paper for discussion drafted by the board of the Pact for Skills on Microelectronics

22/06/2022

Connect – Collaborate – Innovate – Grow – Prosper

The board of the Pact for Skills on Microelectronics

- Patrick Bressler, Director at Fraunhofer Microelectronics Group, Fraunhofer Gesellschaft
- Francoise Chombar, Co-founder & Chairwoman at Melexis, President at Flanders STEM-platform
- René Claessen, Chair, Pact for Skills Executive Board, SEMI Europe
- Bernd Deutschmann, Prof. Dipl. Ing. Dr. technology, Graz University of Technology Institute of Electronics
- Peggy Kroeninger, VP Human Resources, Automotive Electronics, Robert Bosch GmbH
- Henryk Schoder, VP Human Resources X-FAB Group
- Martin Stöckl, SVP People & Organization Effectiveness, Infineon Technologies AG
- Christopher Frieling, SEMI Europe, Director Advocacy and Public Policy

Companies and organisations endorsing the Pact for Skills on Microelectronics

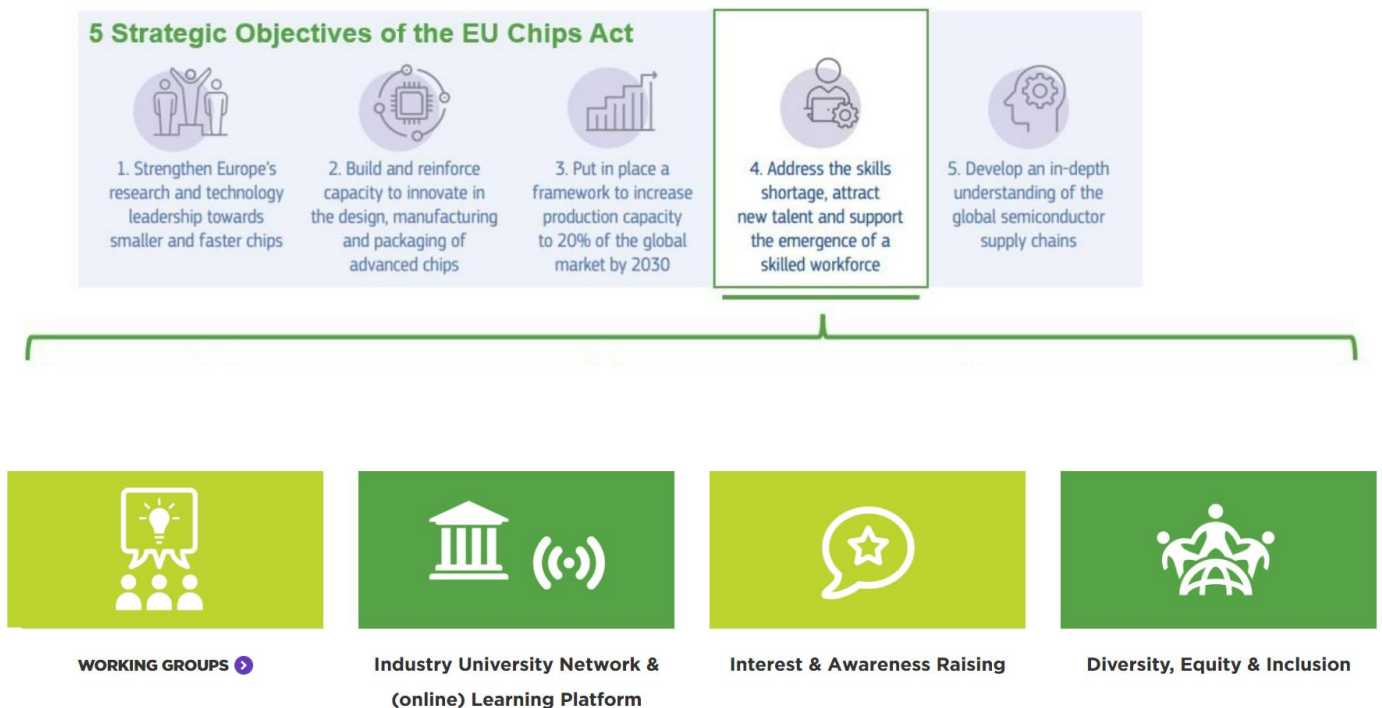


Vision

In 2030 Europe has a highly skilled and well-trained European workforce in the area of microelectronics design and manufacturing, end-user applications and new markets, with attractive job environments and career tracks, including new entrepreneurs and start-ups. **We close the gap of skilled people needed to achieve goals set by the European Chips Act and support the European ambitions on microelectronics design and manufacturing to double Europe's market share by 2030.**

By 2030 the European Chips Skills 2030 Academy will have developed an ecosystem offering career paths in the microelectronics industry that are attractive and accessible to all talented people in the entire EU regardless of their gender, belief, age, nationality, or background. Certified, industry approved "European University Degrees" will be accessible to all in the EU who are interested and attract significantly more talents to the microelectronics sector.

Working groups of the Pact for Skills on Microelectronics



Executive Summary

To build on the success of Europe and to stay a meaningful global player, we need to invest to maintain our leadership position in microelectronics R&D, Design and Manufacturing. We cannot delay investments in this area, including investments on upskilling and reskilling of our workforce.

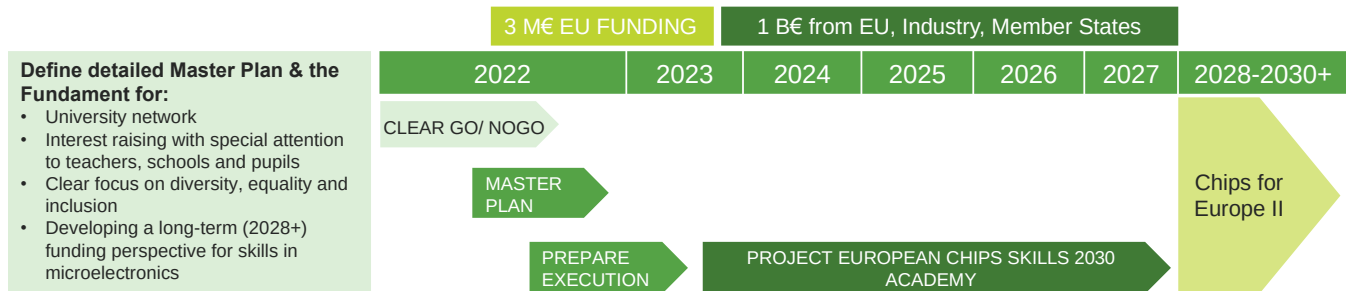
Already today there is a significant shortage on microelectronics skilled personal on Technician, Bachelor and Master level. The European Chips Skills 2030 Academy program will deliver in the coming five years a European pipeline engine capable of educating 500.000 microelectronics experts in the coming decade that are crucial for the success of the Chips Act. Without this skilled workforce, Europe will not have the fundament to even come close to its 20% manufacturing capability goal in 2030, even stronger, Europe's global manufacturing share will further drop.

The European Chips Skills 2030 Academy will build on the national competence centers as the back bone for skills and capacity development. The Academy will complement these competence centers with a long-term perspective on closing the skills gap with an inclusive approach regarding gender, belief, age, nationality, or background. The European Chips Skills 2030 Academy will be stakeholder and especially industry driven and operate on a European level. The Academy will work with the European Digital Innovation Hubs(EDIHs) or other innovation ecosystems such as Knowledge and Innovation Communities of the European Institute of Innovation and Technology (EIT KICs). It is essential that the European Chips Skills 2030 is coordinated on an overall EU level in order to tackle the skills gap within the EU. National competence centers and existing predominantly regionally anchored industry initiatives alone would further deepen the already existing knowledge divide in the European semiconductor industry. European wide accessibility and capacity building in all regions is a distinct target of the Academy.

The European Chips Skills 2030 Academy is first and foremost an industry university network. It will provide scholarships, apprenticeships, facilitate laboratory access, vocational as well as online training, all being part of a European wide network of Universities and trainings centers. It will provide tailored microelectronics upskilling and reskilling programs on several, accredited levels. The activities will further include raising of interest for the sector by a European wide image campaign on how semiconductors contribute to a better life and a better planet, with a clear focus on Diversity, Equity and Inclusion in all programmes.

The past decades, Europe has fallen behind in semiconductor manufacturing, declining from 24% of global production capacity in 2000 to 8% today. As the global semiconductor industry is expected to double to approximately \$1 trillion of annual revenues by the end of the decade, if no action is taken, the European semiconductor manufacturing capacity will fall below 4%, making it virtually irrelevant on a global scale. Therefore, we cannot wait to build the skilled workforce we need to stay relevant on a global scale. The time to act is now.

To start this program, 3 M€ EU funding in 2022-2023 is needed to lay the basis for the program, followed by approximately 1 B€ combined funding from industry, member states, regions and the EU in 2024-2027 for execution, see summarized planning schedule below. If this European Skilling Program is not coordinated on an overall EU level, the countries that will make the race will most likely be those who can afford this, creating a potential disbalance in the development of the EU.



Goals

1) The establishment of a European Chips Skills 2030 Academy: A European Industry University (online) Training Network, offering Leadership in Microelectronics Training Programmes with accreditation for Technician, BsC and MsC levels, endorsed by the European Industries, Research Centers, Universities and Training Centers. Potentially also including PhD levels

- Creation of a European Steering Board that provides guidance on the curricula of university degrees (esp. large companies could help to identify skills needs, this will build on the METIS skills observatory council)
 - A network of university chairs across the EU in cooperation with industry will underpin the steering board
- The establishment of endowed professorships in specific fields of microelectronics at universities that have their research focus on one of the future focal points.
- Expansion of certain already existing research and training focal points at European universities with the aim of establishing further universities of excellence in defined focal points of European microelectronics that are important for the future (e.g. KU Leuven: Telecommunication & Connectivity, TU Graz: Analog Chip Design, TU Dresden: Broadband Communications...)
- Promote the exchange of students and researchers between these universities of excellence (e.g. Students take core courses at one of the universities of excellence for one semester and are then passed on to the next university of excellence).

- Seek strong collaboration with the European Institute of Technology (EIT)
- Supporting the national competence centers in engaging three layers of vocational education and training: (I) regional, (II) national/member state, and (III) European scale,
 - SMEs in cooperation with large companies or public authorities could develop intercompany training centers,
 - VET (Vocational Education) providers could develop training programmes, including those developed by the Centers of Vocational Excellence,
 - Regional authorities in cooperation with VET providers could invest in an intercompany training centre for SMEs,
 - SMEs could join existing or develop networks where they would exchange on skills needs
- Establish European wide and sector specific internship, apprenticeship, and scholarship programs (building on existing funding programmes such as Erasmus).
- Facilitate accessibility to pilot lines and industry infrastructure to support apprenticeships and give training institutes and universities access to manufacturing technologies, and experiment with new designs and processes, building where possible on the EUROPRACTICE projects.
- Support of the creation of a new ecosystem that includes next to manufacturing facilities and pilot lines also new design methodologies and tools to build advanced libraries.
- Dedicated (targeted) training on high-tech entrepreneurship, design- and tech-based business models, trend scouting, and inclusive leadership.
- For several of these activities the established clusters (see list of potential partners) will play a key role, as they provide already similar activities, but they should be coordinated and made accessible throughout whole Europe.
- Overall work with an inclusive approach regarding diversity in different phases of the establishment of the European Chips Skills Academy 2030
- Offering an International University-Technology Partnership Programme:
 - Joint Industry-University Partnership programme (beyond Europe) with internships and (international) work secondments / exchanges for employees/students/professionals with a qualified certification.
 - Partnership with the American Semiconductor Academy (ASA)
 - International collaborations on dedicated “technology-based innovation” curricula for start-up support, best practices for tech & IP management and specifically focused “entrepreneurship training” for people with a STEM-training background (Science, Technology, Engineering and Mathematics).

2) Interest raising by effective communication in such a way to touch the hearts and minds of all Europeans on how semiconductors contribute to a better life and a better planet – with a special attention to teachers, schools and pupils. Today, semiconductor companies even rank lowest amongst peers such as Tech companies and Automotive companies on workplace attractiveness.

- Europe-wide, easy-accessible and innovative online platform for the European Chips Skills 2030 Academy with the following elements:
 - Awareness raising
 - online learning platform with courses for teachers (to reach out to pupils), students and professionals
 - matchmaking for students and professionals, teachers and pupils
 - job offers, internship offers, scholarship offers etc. of all partners
- Creating awareness on how microelectronics drives our modern lives and how it is the fundament of innovative devices, enabling people to connect with each other and care for each other in more and more advanced ways.
- Especially forming the tools for creating awareness with an inclusive approach in mind to attract all possible talent regardless of their gender, belief, age, nationality, or background.
- Availability of Experience Showrooms on state-of-the-art Microelectronics, including virtual showrooms, streamers, bloggers, Wikis, Tech-slams and competitions. Also reaching schools and parents with the above.
- Motivate scholars early on to visit the (virtual) experience showrooms, enable skills and capability building in all EU nations and regions.
- Dissemination of best practices throughout all EU countries and regions.
- Stimulating inflow of talented students and professionals from outside Europe
- Actively reaching out to the countries that are not yet represented by the organizations that are endorsing the Pact for Skills and involving these countries in the overall programme.

3) Clear focus on Diversity, Equity and Inclusion in all programmes.

- Motivating and including students and professionals of all diversities will be a key focus through the entire programme,

- Improve communication to attract a large diversity in the training programmes, especially women to start with.
- Develop dedicated diversity training
- Develop a gender and unconscious bias check for job postings and alike
- Analyse drop-outs from the training programmes and take corrective action if this would be related to diversity.

4) Develop a long-term funding perspective for skills in microelectronics and the European Chips Skills 2030 Academy

- Funding for continuation of the program by Industry and by tapping into recovery funds such as the Recovery and Resilience Fund.
- Build on existing programmes such as Erasmus+, Marie Curie Actions and alike
- Work towards a longer term perspective of the Chips for Europe Initiative (MFF post 2027)
- Explore how to pool funding for national, regional and European sources

Scope of immediate activities

The immediate activities shall lay the grounds for the European Chips Skills 2030 Academy. They will include the definition and founding of the industry university network as well as further defining and starting the key activities of the network such as:

- Define hubs and establish the network and activities
- Create a core team and management structure
- Create a dedicated online platform for the network supporting online learning as well as vocational training. Build on the Erasmus+ project METIS
- Seek collaboration with the European Institute of Innovation and Technology (EIT).
- Identify key training providers (Universities, VET-providers, etc.)
- Develop certification (building on METIS and EIT)
- Develop dedicated internship / scholarship / apprenticeship programmes
- Establish the steering board for aligned, European wide curricula with industry, building on the skills observer council established under the Erasmus+ project METIS

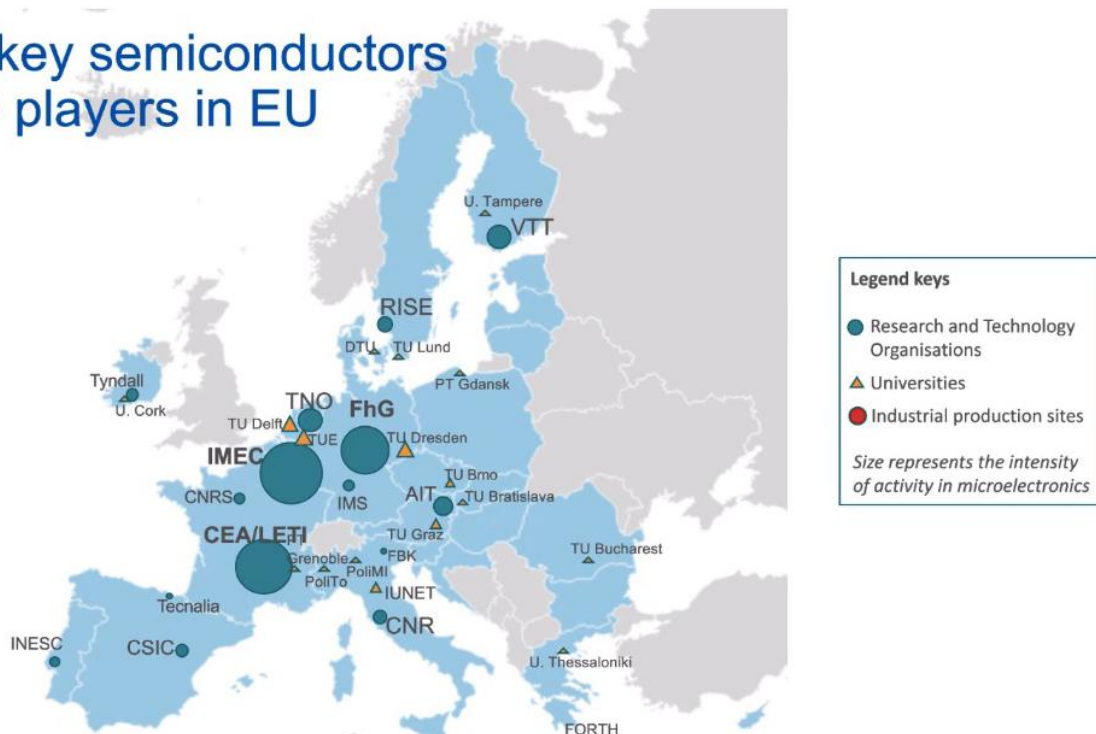
- Systematically explore and streamline long term funding opportunities for continuation of the program by Industry and by tapping into existing programs on European and MS level incl. the Recovery and Resilience Fund (see also EURO PRACTICE, as mentioned above).
- Develop an awareness and interest campaign with a strong focus on schools, young people and their parents
- Set up a DEI (Diversity, Equity and Inclusion) check mechanism for all activities

Related reference projects and activities of the core partners

- Pact for Skills for Microelectronics
- Erasmus+ project METIS: MicroElectronics Training, Industry and Skills
- Ongoing proposals for Testing and Experimentation Facilities (TEFs) under Digital Europe
- Erasmus+ project ECoVEM: European Cooperation platform of Vocational Excellence in Microelectronics

Potential Partner Universities and Research and Technology Organisations

The key semiconductors R&D players in EU



Source: European Commission, Chips Act – General Presentation, KDT Governing Board, 16/2/2022

Existing links of the Pact for Skills partners – non exhaustive list

Universities & Training centers (potential core in bold)	Research centers / Training partners	Regional Clusters	Industry partners and other stakeholders
• KU Leuven • TU Graz / FH Graz / FH Kärnten / TU Wien / Uni Linz • TU Munich/ Erlangen / Darmstadt / TU Dresden / RWTH / TU Berlin / Uni Hannover • Universities in Milano / Lecce / Padova / Pavia / Politecnico di Torino / Modena / Catania • Lund / KTH • Tallin University of Technology • TU Sofia • EPFL / ETH, Switzerland • Trinity College Dublin • TU Delft / Eindhoven • Uni Crete • Uni Lisbon • Uni Granada • Warsaw TU • Bagazci • Uni Glasgow • KIT Karlsruhe • UNI Grenoble	• IMEC / Leuven • Grenoble / INSA Toulouse / CEA Leti • Fraunhofer • FORTH – Foundation for Research and Technology, Greece • INL – Iberian Nanotechnology Laboratory, Portugal • Holst Center, Eindhoven • VTT – Finland • Tyndall – Tyndall Ireland • CSEM (Switzerland) • SAL – Silicon Austria Labs	• Silicon Saxony • Grenoble Minattec • Business Finland (more general, not specific microelectronics) • Flanders • Euroregion • Silicon Alps Austria • Milano • Brainport Eindhoven • Silicon Europe: Cluster of Clusters for detailed list of partners see: https://www.silicon-europe.eu/partners/	Pact for Skills • Infineon • Bosch • Melexis • Xfab • Intel Others • Decision Etudes et Conseil (France) • WITEC EU • STEM coalition