The European Chips Act in the midst of the Semiconductor Crisis

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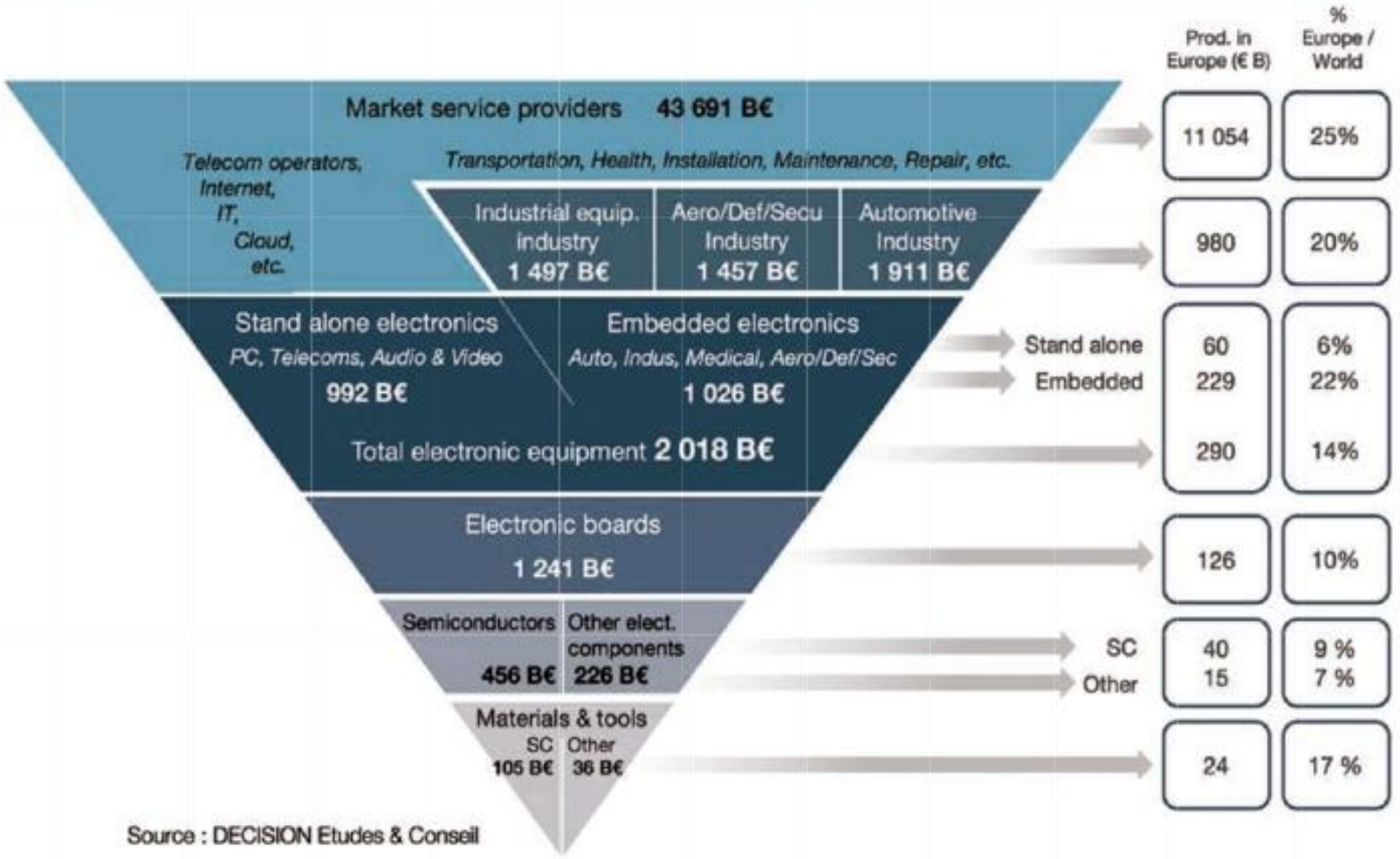
Applepies 2023, Genova, September 28, 2023

Outline

- Facts: the global landscape and the position of Europe
- A Chips Act for Europe: the three pillars
- The position of the Italian Government w.r.t. the semiconductor crisis and the Chips Act

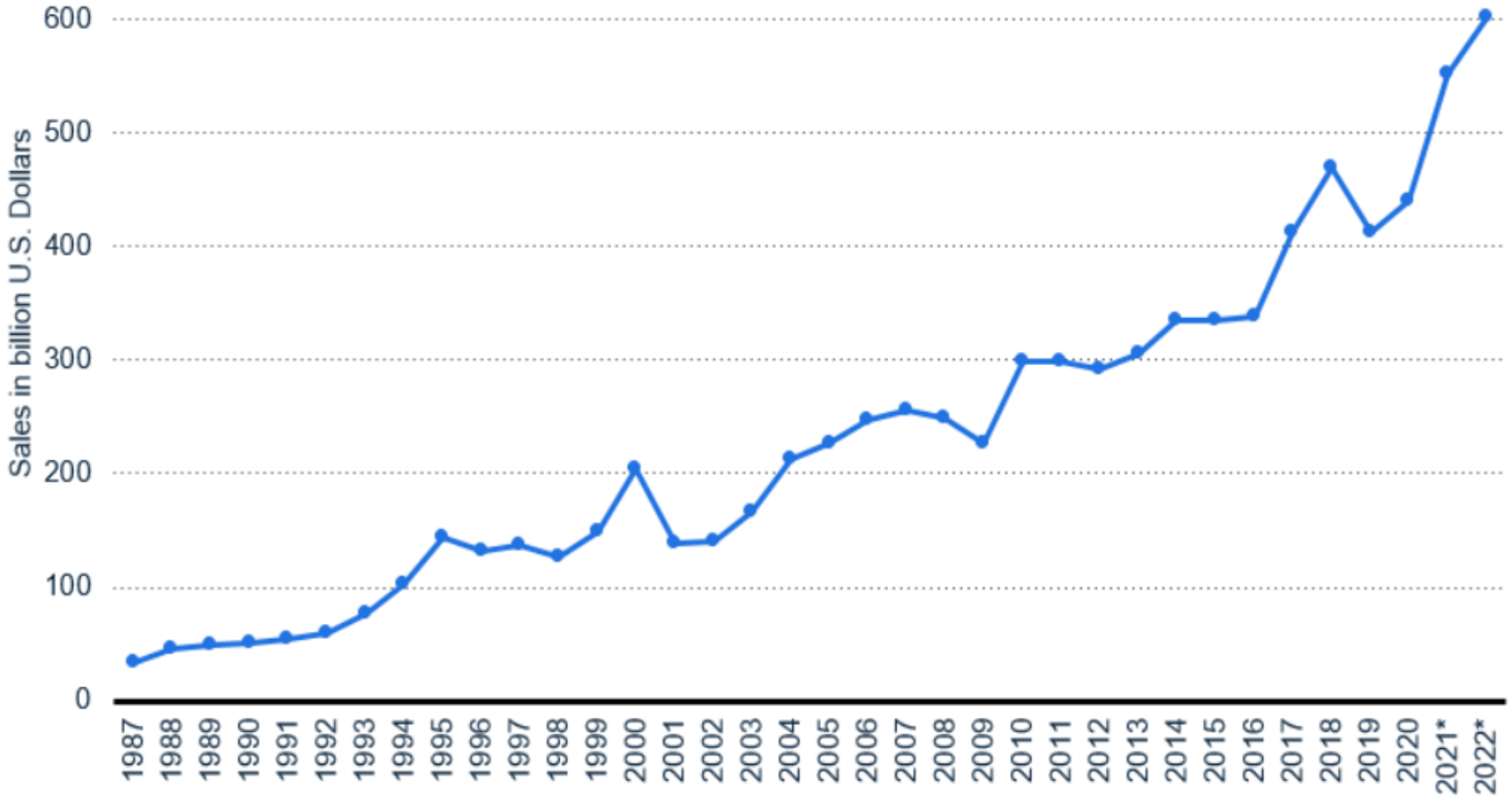
The digital supply chain: Where does EU stand?



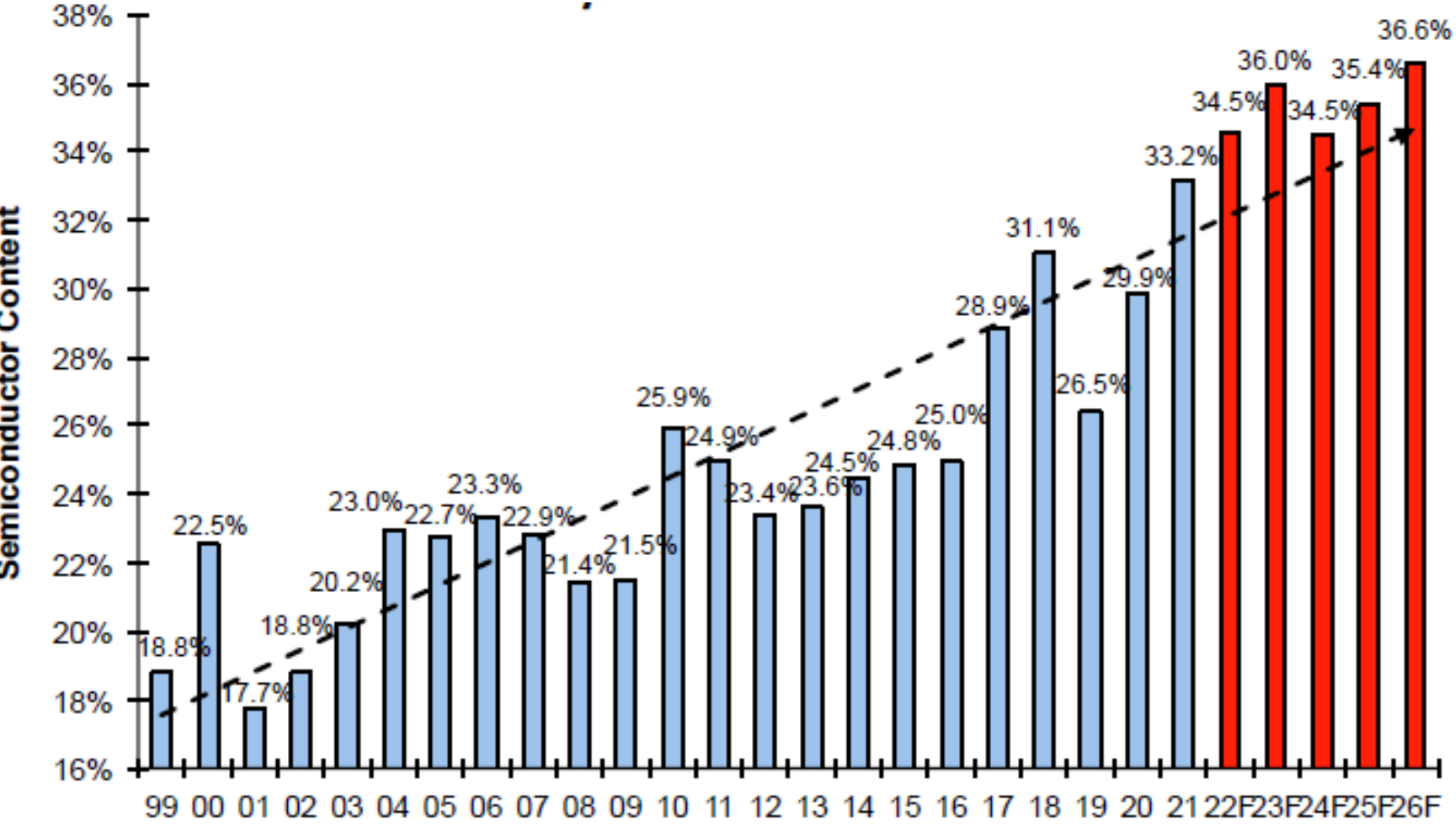
Source : DECISION Etudes & Conseil

Data of 2018

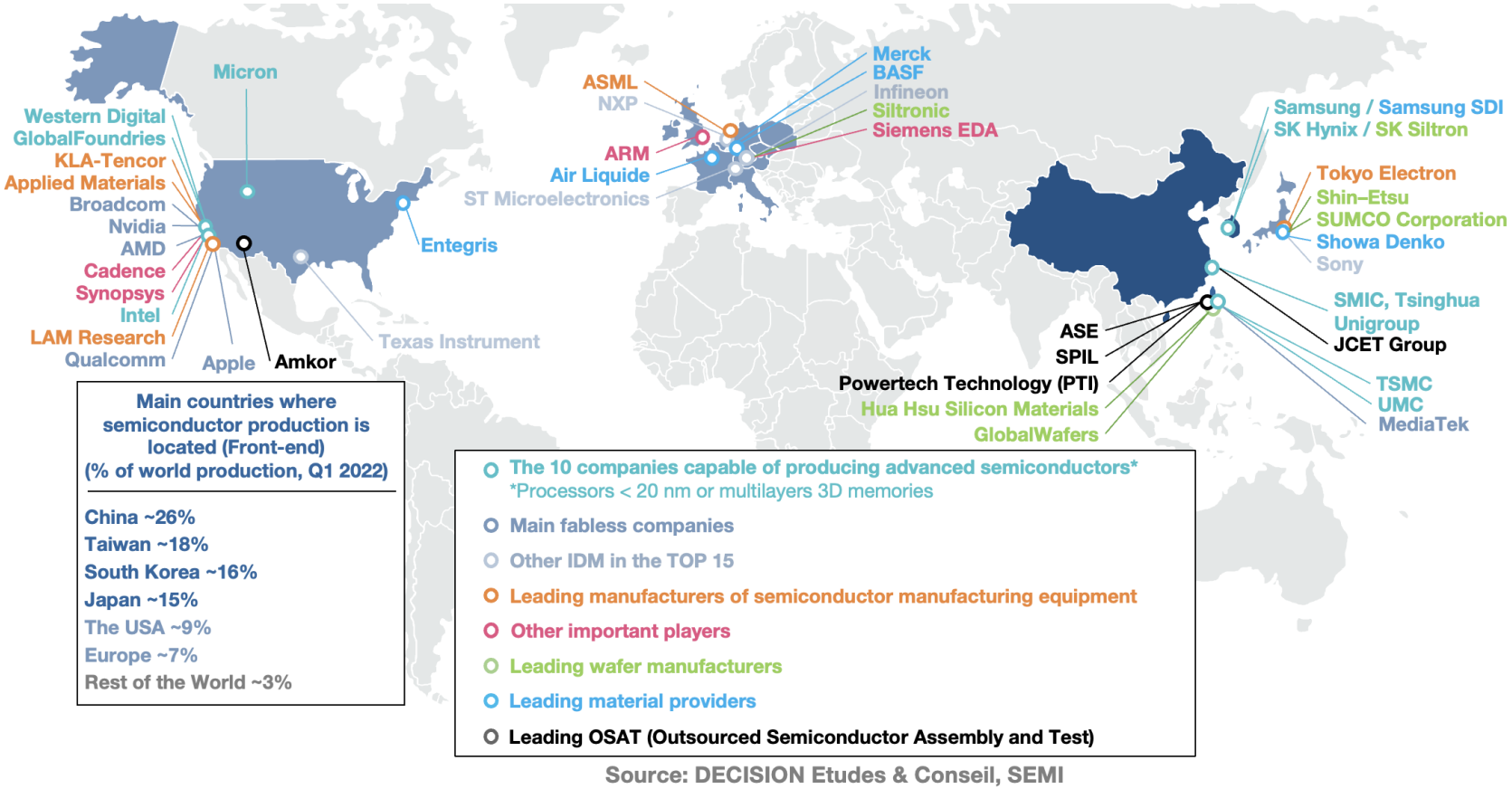
Semiconductor Industry Sales Worldwide 1987-2022 (Source: WSTS)
USD 600 B in 2022



Semiconductor content in electronic systems (Source: IC Insights, ST, TI)



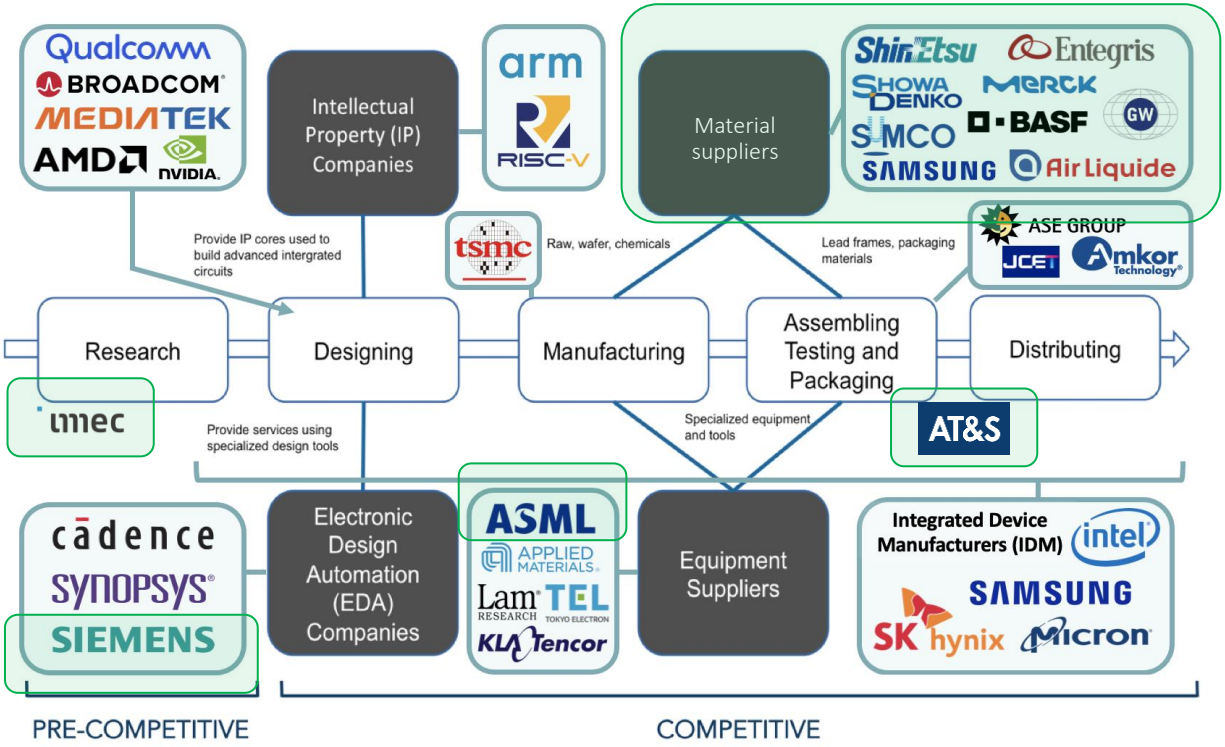
Global Semiconductor landscape



Source: DECISION Etudes & Conseil, SEMI

Main EU strengths

Key EU players



Source: DECISION Etudes & Conseil, ESIA

Strengths in applications

- Automotive
- Industrial & robotics
- Security
- Health & Care

Strengths in products

- MCU
- Sensors & MEMS
- Power
- Analog / RF
- Thin edge computing
- Security IC

EU IDMs

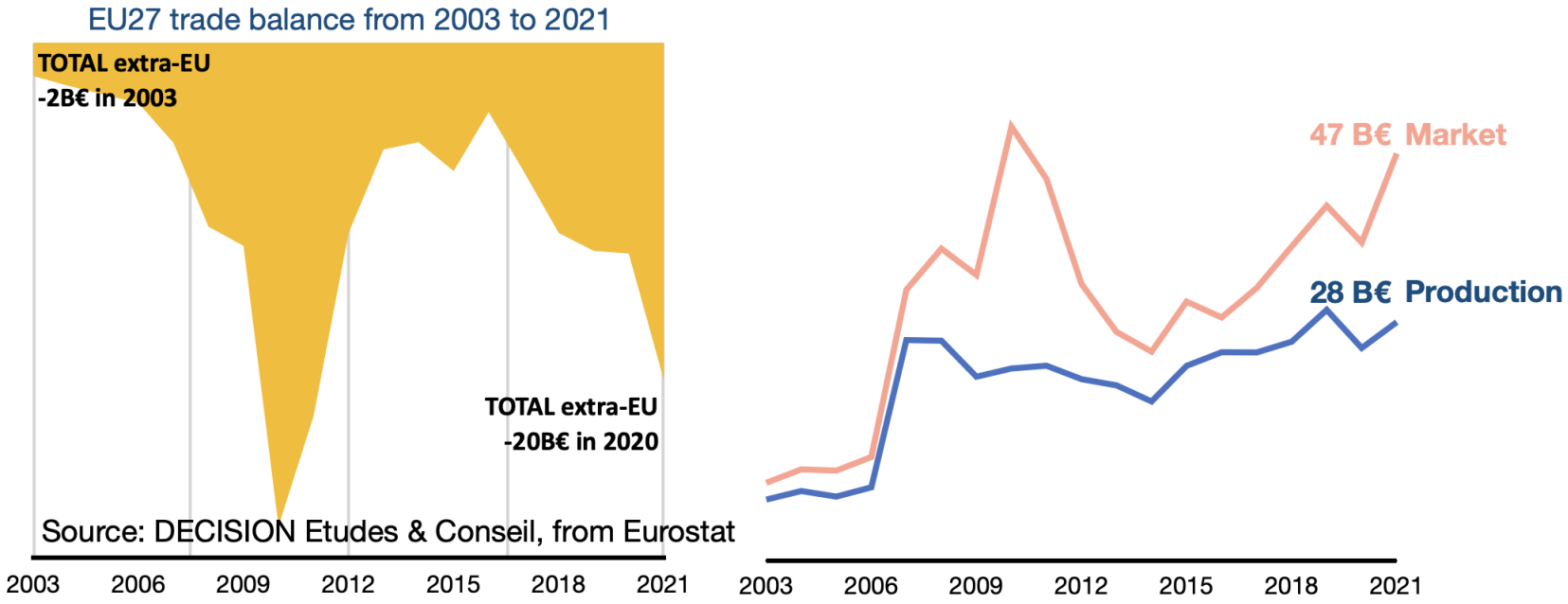
ST NXP Infineon BOSCH ams

Strengths and weaknesses of the European ecosystem

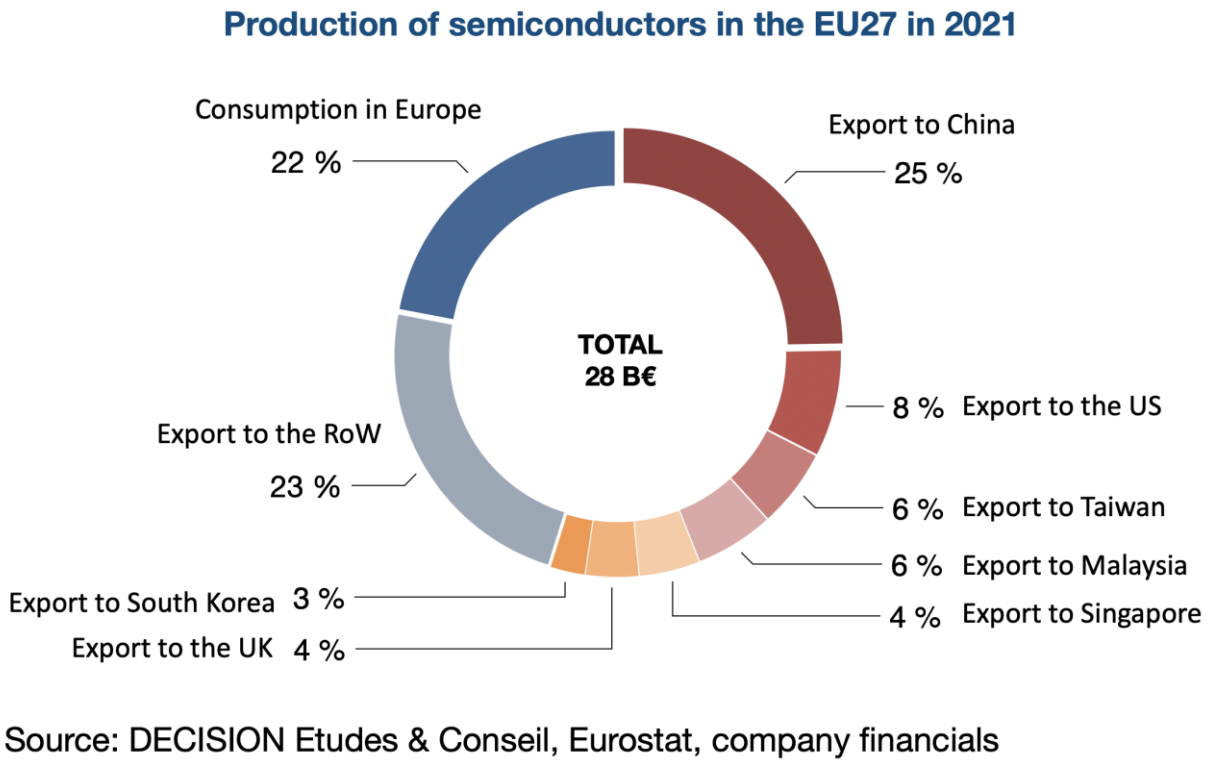
Investments in production facilities in Europe in the past two decades was rather limited, as a consequence EU's share of worldwide capacity decreased from **11.7% in 2005** down to **7.2% in 2020** , with little presence in the more advanced digital nodes.

In 2021, the EU's trade deficit for semiconductors was almost EUR 20 billion with exports amounting to **EUR 31.5** billion while imports amounted to **EUR 51** billion, and this with fabs working at full capacity.

The EU semiconductor trade balance



Semiconductor trade partners of the EU (By location)



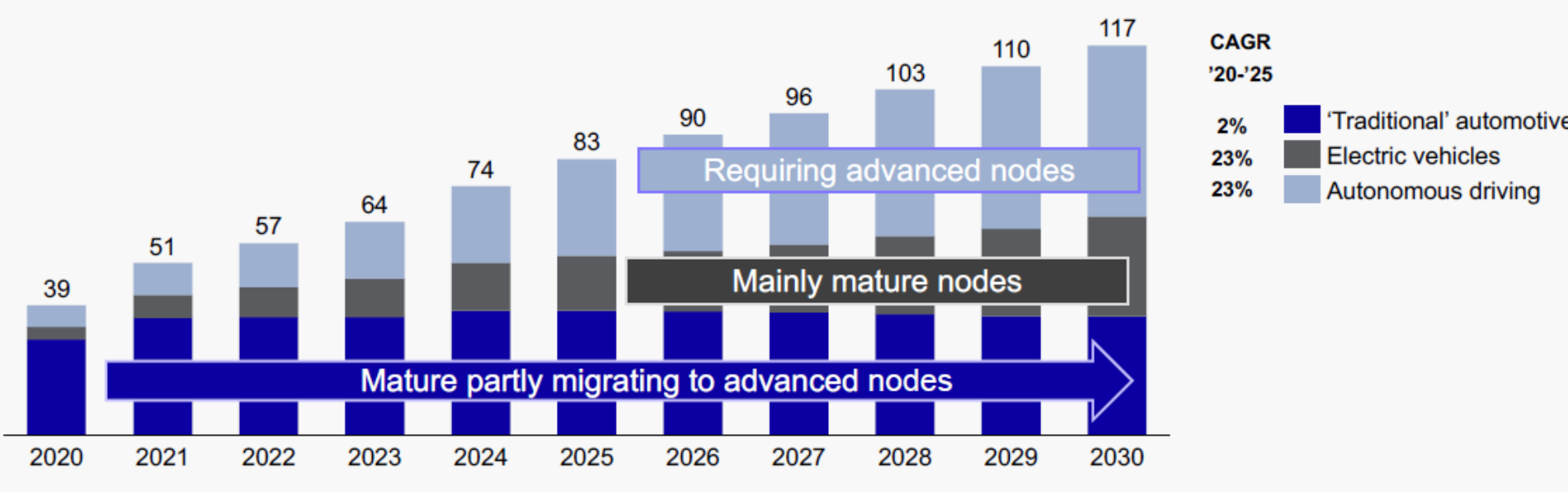
Source: DECISION Etudes & Conseil, Eurostat, company financials

EU Strengths: the Automotive Sector

The increasing demand of semiconductors components in the automotive sector is driven by three factors:

- connectivity for safety and infotainment systems
- increased automation levels
- the move towards electric vehicles.

Semiconductor market evolution for automotive chips, in USD billion (Source: ASML, Gartner 2022)



A Chips Act for Europe

*On 8 February 2022, the European Commission proposed the **Chips Act**, a comprehensive set of measures to confront **semiconductor shortages** and **strengthen Europe's technological leadership***

*On 11 May 2022 the European Commission published a Staff Working Document named **"A Chips Act for Europe"***

The European Parliament approved the regulation on January 24 2023.

Trilogue negotiations started in February and ended in June 2023.

Budget

A new semiconductor objective is created within the Digital Europe Programme which will support capacity building in the Chips-sector and funds are also mobilised within the research framework Horizon Europe, amounting to a total of **€ 3.3 billion for the 'Chips for Europe Initiative'.**

The financing solution was found within the limits of the existing interinstitutional agreement on the Multiannual Financial Framework and comes on top of resources already allocated to similar objectives within the MFF and through the digital strand in the Recovery and Resilience Facility.

Recent Progress

- Following the Council's approval on 25 July 2023, the Act has been adopted. After being signed by the President of the European Parliament and the President of the Council, the regulation will be published in the Official Journal of the European Union and will enter into force on the third day following its publication.
- Once the Chips Act is adopted, the Council will establish the **Chips Joint Undertaking**, which builds upon and renames the existing **Key Digital Technologies Joint Undertaking**.
- The new **Chips Joint Undertaking** will be launched on November 30 in Bruxelles.

The Three Pillars of the Chips Act

- Pillar 1: **The Chips for Europe** Initiative: R&I and Capacity Building (**Pilot Lines**)

- Pillar 2: **Security of supply** by attracting investments and increasing production capacities (concept of "**first of a kind**")

- *Pillar 3: coordinated actions for Monitoring and Crisis Response*

Pillar 1: the Chips for Europe Initiative

- Closing the gap from Lab to Fab (investing in **Pilot Lines**)
- Investing in a virtual **design platform** that leverages on the Pilot Lines.
- Access via **National Competence Centers** that will also provide the necessary skills, not only in the use of the design tools and infrastructures but also in those required to address the **severe skills shortages** faced by the EU microelectronics sector

Implementing the Chips for Europe Initiative: the Chips Joint Undertaking

- The present **KDT Joint Undertaking** will enlarge its scope and be renamed **Chips JU**.
- €4.175 billion EU funding and activities broken down into R&I activities (€2.725 billion) and capacity building activities (€1.450 billion)
- The Chips JU will implement the following components of the Chips for Europe Initiative:
  - design capacities
  - new and existing pilot lines
  - national competence centers and skills development
- The new Chips JU will be launched in Bruxelles on November 30, 2023

First steps of the new Chips JU

- A number of calls will follow the launch of the Chips JU
- PILOT LINES
  - First call End 2023
  - Q2 2024 selection
  - Q4 2024 second call
  - Q2 2025 selection
- Design Platform
  - Call end 2023
  - Q2 2024 selection of the DP by the PAB
- Competence Centers
  - End 2023 : Member state to designate candidates
  - Q1 2024 : restricted call to designated candidates
- Regular JU Calls for RIA and IA (Q1 2024)

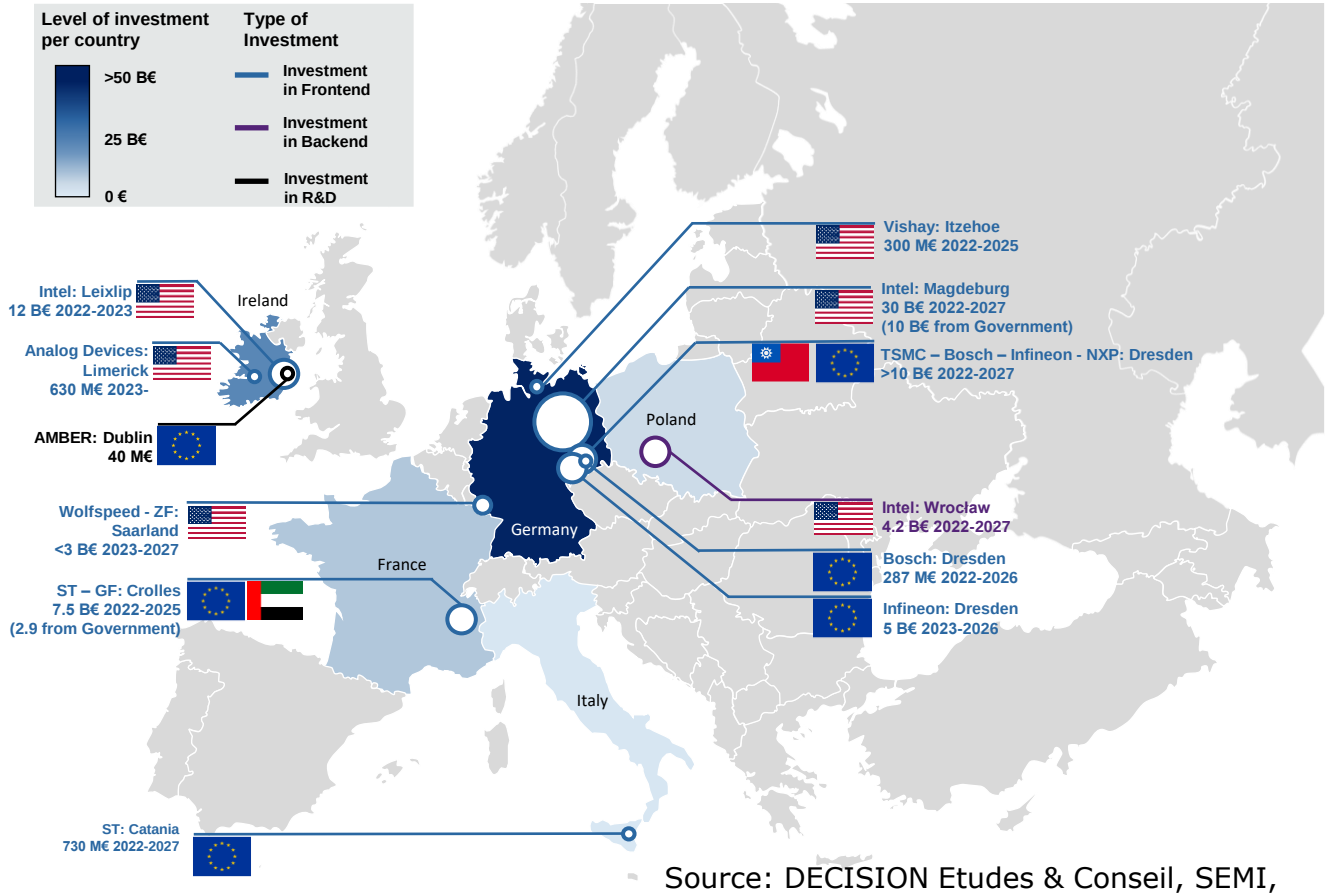
Pillar 2: A Framework to Ensure Security of Supply

- the EU needs to reinforce its capacity in the production of **mature nodes**, essential for the functioning of its economy, while at the same time preparing for investing in production of nodes **smaller than 10 nm**.

First-of-a-kind facility

- definition of a ***First-of-a-kind*** facility in the Union as an industrial facility (front-end, back-end), that is not already present in the Union. **Applicable to any technological node, leading edge or not.**
- *the Commission will consider the First-of-a-kind label among others into account in the possible State aid procedure.*
- *First-of-a-kind* facilities can be Integrated Production Facilities (IPF) or Open EU Foundries (OEF).
- the recent green light to the Italian Government support for a new ST-Microelectronics plant in Catania goes along this line

Key investment projects in the EU

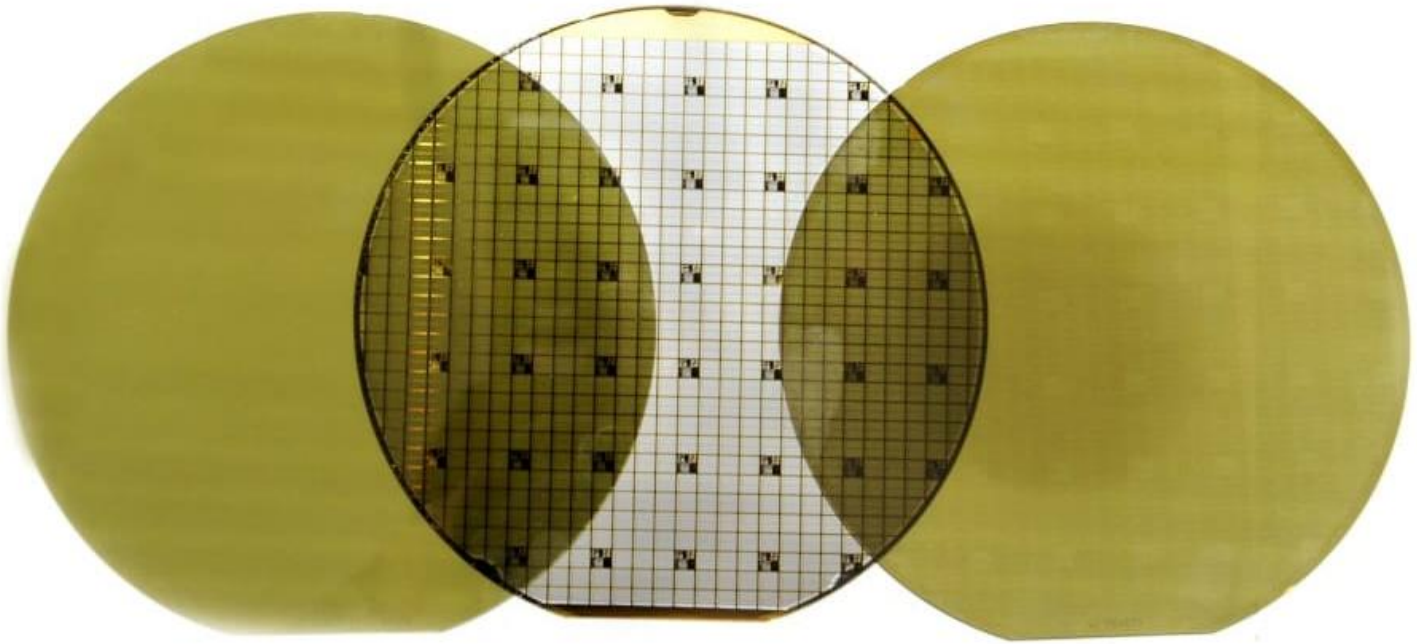


Source: DECISION Etudes & Conseil, SEMI, 2023

The position of the Italian Government w.r.t. the semiconductor crisis and the Chips Act

Decree law 1 March 2022, n. 17, Article 23

- ✓ To promote R&I in microelectronics….. a fund is set up in the Ministry's of economic development's budget with a budget of 150 million euros for the year 2022 and 500 million euros for each of the years from 2023 to 2030.



MUR
Ministero dell'Università e della Ricerca

Task force on Semiconductors

March 2023

MINISTRY OF RESEARCH (MUR)
TASK FORCE ON SEMICONDUCTORS
Objective

Strengthen microelectronic research capabilities by investing on competences (quality and quantity).

DM May 2022 and DM March 2023

Members

Members of the task force are Researchers and Professors of leading Italian Universities and RTO's, with proven experience in applied research and industry collaboration, together with Industry Executives .

Enrico Sangiorgi
Coordinatore della task force
Professore Ordinario di Elettronica presso ***Alma Mater Studiorum Università di Bologna***

Luca Benini
Professore Ordinario di Elettronica presso ***Alma Mater Studiorum Università di Bologna***

Paolo Giuseppe Ravazzani
Dirigente di ricerca presso ***Consiglio Nazionale delle Ricerche*** *(CNR) - Milano*

Rosario Corrado Spinella
Dirigente di ricerca presso ***Consiglio Nazionale delle Ricerche*** *(CNR) - Roma*

Sergio Saponara
Professore Ordinario di Ingegneria Elettronica presso ***Università di Pisa***

Francesco Svelto
Professore Ordinario di Ingegneria Elettronica presso ***Università degli Studi di Pavia***

Giovanni Verzellesi
Professore Ordinario di Elettronica presso ***Università degli Studi di Modena e Reggio Emilia***

Massimo Violante
Professore Associato di Ingegneria Informatica presso ***Politecnico di Torino***

Cristina Silvano
Professore Ordinario di Sistemi di Elaborazione delle Informazioni presso ***Politecnico di Milano***

Donatella Sciuto
Professore Ordinario di sistemi di elaborazione delle informazioni presso ***Politecnico di Milano***

Raffaella Sadun
Professor of Business Administration presso ***Harvard Business School***

Carlo Cavazzoni
Senior Vice President of Cloud Computing e responsabile del Leonardo Lab dedicato all'HPC presso ***Leonardo***

Alessandro Cremonesi
Chief Innovation Officer presso ***STMicroelectronics***

Fabrizio del Maffeo
Chief Executive Officer presso ***Axelera AI***

Michele Benedetti
Chief Technology Officer presso ***Datalogic***

A working document on semiconductor policies

- ✓ A group of experts from different Ministries (Prime Minister Staff, Ministries of Economic Affairs, Industry and Research) have carried out a detailed analysis and produced a report on the Semiconductor value chain in Italy, including Research, Semiconductor Manufacturing and Strategic Industry sectors which depends critically on Semiconductors (Automotive, Automation, etc.).
- ✓ The document suggests a long-term strategy in the Semiconductor sector and tohelp the policy makers in their choices on the allocation of resources.
- ✓ In October 2022 the report has been presented to the Government.

ChipsIT: the Italian Center for chips design

- ✓ As outlined in the Chips Act documents, the design of IC's represents over 30% of the total added value of the semiconductor industry but it is not sufficiently developed in Europe and in Italy.
- ✓ The demand for design of advanced IC's has been increasing by the semiconductor industry and by the application sectors (automotive, automation, etc.)
- ✓ The working document prepared for the Italian Government suggested the establishment of an Italian Center for the design of semiconductor integrated circuits with a three-fold mission: prepare new talents, support the semiconductor industry and help the application sectors that are more and more depending on advanced IC's, to approach this know-how.

The 2023 Budget Law

- ✓ The budget law for 2023 has established the *Italian center for the design of semiconductor integrated circuits*, in order to promote the design and development of integrated circuits, strengthen the system of professional training in the field of microelectronics and ensure the establishment of a network of universities, research centers and enterprises which favors innovation and technological transfer in the sector.

- ✓ The Center has been endowned by initial budget of 30M€/year for 8 years

- ✓ Statute and Governance of the Center will be formalized shortly.

LA FONDAZIONE NAZIONALE

Ora è ufficiale: avrà sede a Pavia il Centro italiano per i microchip

Il ministro Urso: «Decisione presa con i colleghi Giorgetti e Bernini. Qui il polo strategico sul digitale»

Luca Simeone / PAVIA

«Abbiamo deciso con i ministri Giorgetti e Bernini di realizzare proprio a Pavia la Fondazione nazionale sui chip, cosa che sarà attuata nei prossimi mesi. Un progetto per fare di Pavia e della Lombardia un polo strategico per l'industria digitale». Le parole del ministro delle Imprese e del made in Italy, Adolfo Urso, ufficializzano l'assegnazione a Pavia della sede del "Centro italiano per il design dei circuiti integrati a semiconduttore". Un riconoscimento del fatto che proprio nella nostra provincia si è sviluppato un rilevante distretto della microelettronica, frutto anche della collaborazione tra le imprese e l'Università.

LA CANDIDATURA

Nella legge di bilancio si prevedeva la nascita di una fondazione con l'obiettivo di «promuovere la progettazione e lo sviluppo di circuiti integrati, rafforzare il sistema della formazione professionale nel campo della microelettronica e assicurare la costituzione di una rete di università, centri di ricerca e imprese che favorisca l'innovazione e il trasferimento tecnologico nel settore». La candidatura forte di Pavia e della sua Università era emersa già alcuni mesi fa, ma ieri il ministro Urso ieri ha confermato che la fondazione nascerà proprio qui.

Già ad aprile, in occasione dell'incontro "Microelettronica, industria delle industrie. Il distretto pavese" organizzato nell'ambito della manifestazione "Pavia capitale della cultura d'impresa", il ministro aveva indicato il distretto della microelettronica di Pavia come «modello che vogliamo portare in Italia e nel mondo», aggiungendo alla presenza del rettore dell'Università, Francesco Svelto, e del presidente di Assolombarda, Alessandro Spada, che si tratta di «un modello di partecipazione e collaborazione tra università e impresa da replicare in altri territori. È vitale che, accanto alle eccellenze di sempre, si debbano mettere a valore anche quei saperi innovativi legati al digitale. Stiamo preparando un piano nazionale sulla microelettronica l'applicazione del chips act europeo affrontando e declinando gli obiettivi europei nel nostro Paese e il centro nazionale sul digitale sarà l'atto esecutivo della nostra strategia».

LE RISORSE

La legge di bilancio, prevede anche le risorse «per la costituzione della Fondazione e il suo funzionamento»: viene infatti «autorizzata la spesa in conto di capitale di 10 milioni di euro per l'anno 2023 e 25 milioni per ciascuno degli anni dal 2024 al 2030».

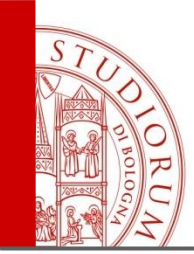
A spingere sugli investimenti e la ricerca nel settore della microelettronica ci aveva già pensato il governo Draghi istituendo il "Fondo per la microelettronica", con una dotazione iniziale di 530 milioni di euro. Una decisione che rientrava in una strategia più ampia, inquadrata dal Chips Act presentato dalla Commissione europea a febbraio 2022, con l'obiettivo di sottrarre il continente alla dipendenza rispetto a Cina e Asia in generale sui semiconduttori e implementare la quota di mercato. Strategia che in Italia assegna ora a Pavia un ruolo da protagonista.—

I NUMERI

Nel distretto nato con l'ateneo dodici imprese

Lo nascita di un distretto della microelettronica a Pavia è frutto dell'accordo di partenariato tra le imprese presenti sul territorio e l'Università, con il sostegno di Assolombarda. Sono in tutto dodici le imprese che ne fanno parte: Allegro Microsystems, Ams Italy, Analog Devices, ASR Microelectronics, Marvell, Huawei, Technologies Italia, Infineon Technologies Italia, Invensense Italy, Inventvm Semiconductor, Photeon Technologies, Synopsis, STMicroelectronics.

Il ministro Alfredo Urso a Pavia tra il rettore Francesco Svelto (a destra) e Alessandro Spada (Assolombarda)



Thank you