Economic landscape analysis to identify opportunities for cooperation

ICOS WP2

Léo Saint-Martin

Associate partner

DECISION Etudes & Conseil

Presentation of WP2: Economic Landscape Analysis

ICOS International Cooperation On Semiconductors

Goals

Economic analysis of the EU semiconductor ecosystem

- Economic / industrial strengths & weaknesses
- Identification of strategic dependencies

=> Identify opportunities for cooperation with 7 countries:
The USA, China, Japan, South Korea, Taiwan, India and Singapore

=> Including photonics-based semiconductors analysis from UGent

Table of contents of the report D2.1
World and the EU

International Cooperation On Semiconductors

1) Overview of the semiconductor industry in the world

- a) Overall context
- b) The global semiconductor landscape
- c) Worldwide leading players in the value chain
- d) Frontend production capacities

2) The EU semiconductor industry

- a) Overall environment and strategic objectives
- b) The EU semiconductor market
- c) The EU semiconductor industry
- d) International trades
- e) Ongoing investments in the EU
- f) Strengths and dependencies
- g) Existing cooperation in which the EU is involved

→ **Same content for 7 countries**

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Agenda – today's presentation

1) Overview of the global semiconductor industry

2) Overview of the EU semiconductor ecosystem
   - Industry, Market, trades, skills, dependencies, roadmap for cooperation

1) Our approach to identify areas for bilateral R&D cooperation

1) Overview of the global semiconductor industry

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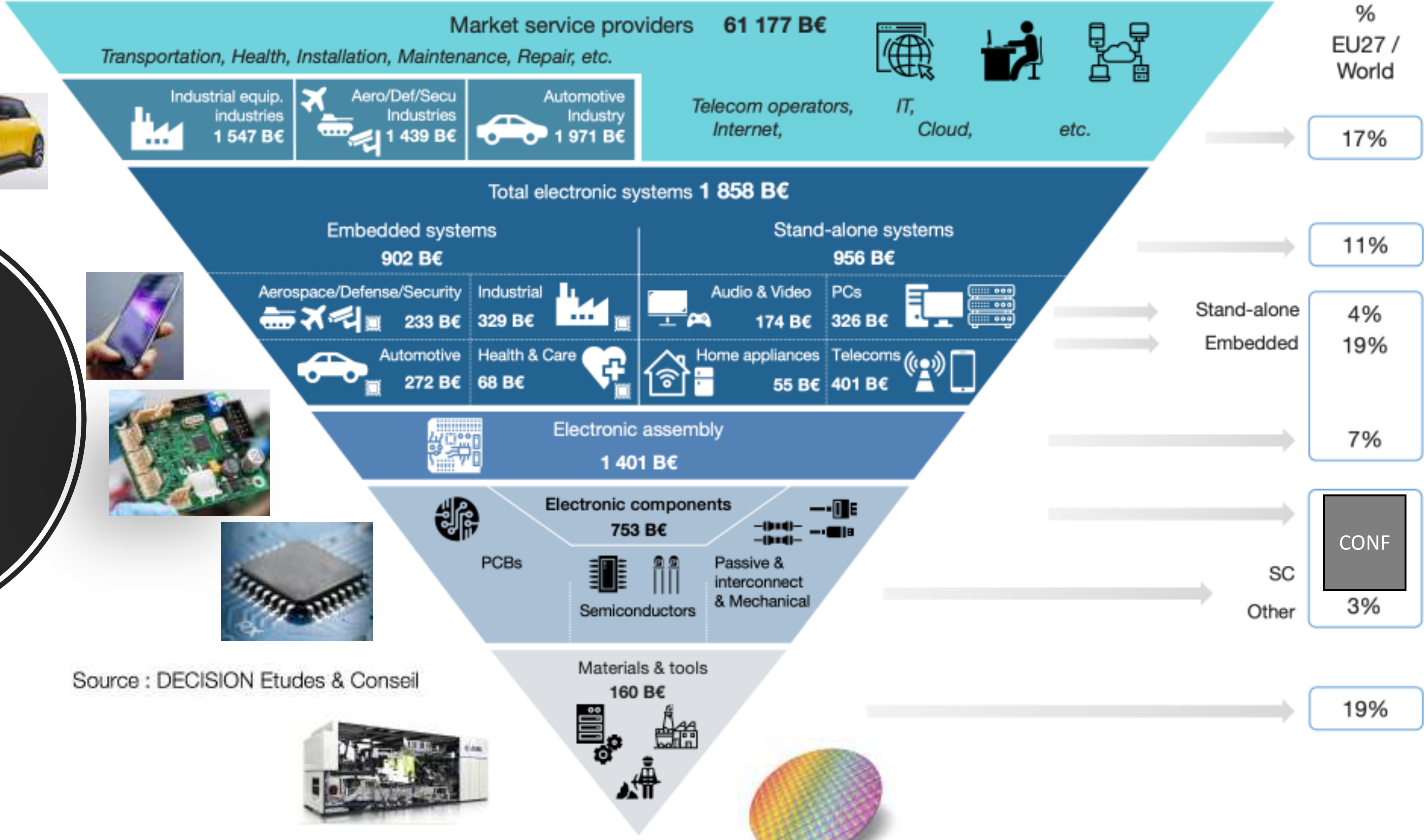
World Electronic manufacturing value chain in 2023

From components to systems



Source : DECISION Etudes & Conseil

Semiconductor front-end manufacturing in 2023

- Asian regions counting for 75% of global capacities

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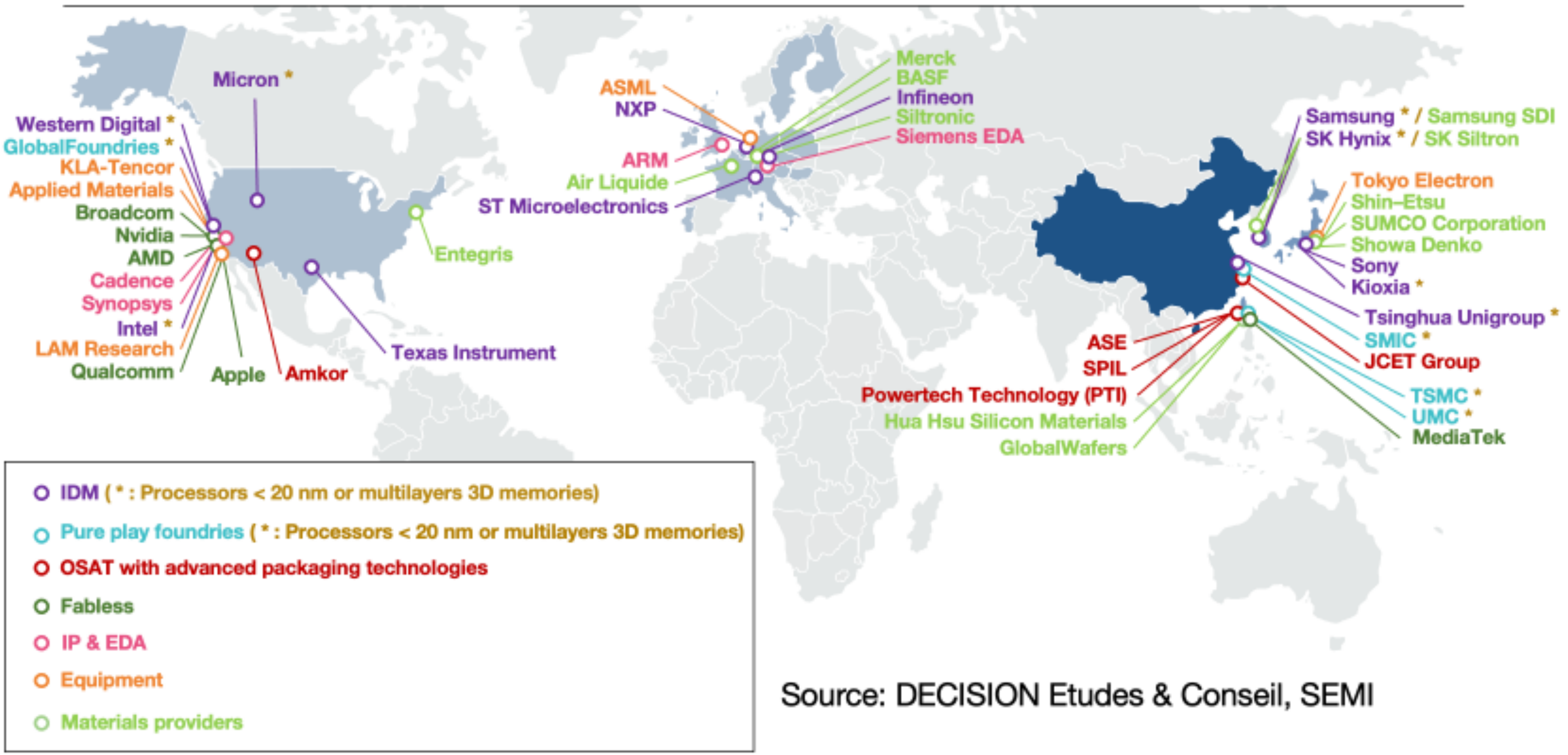
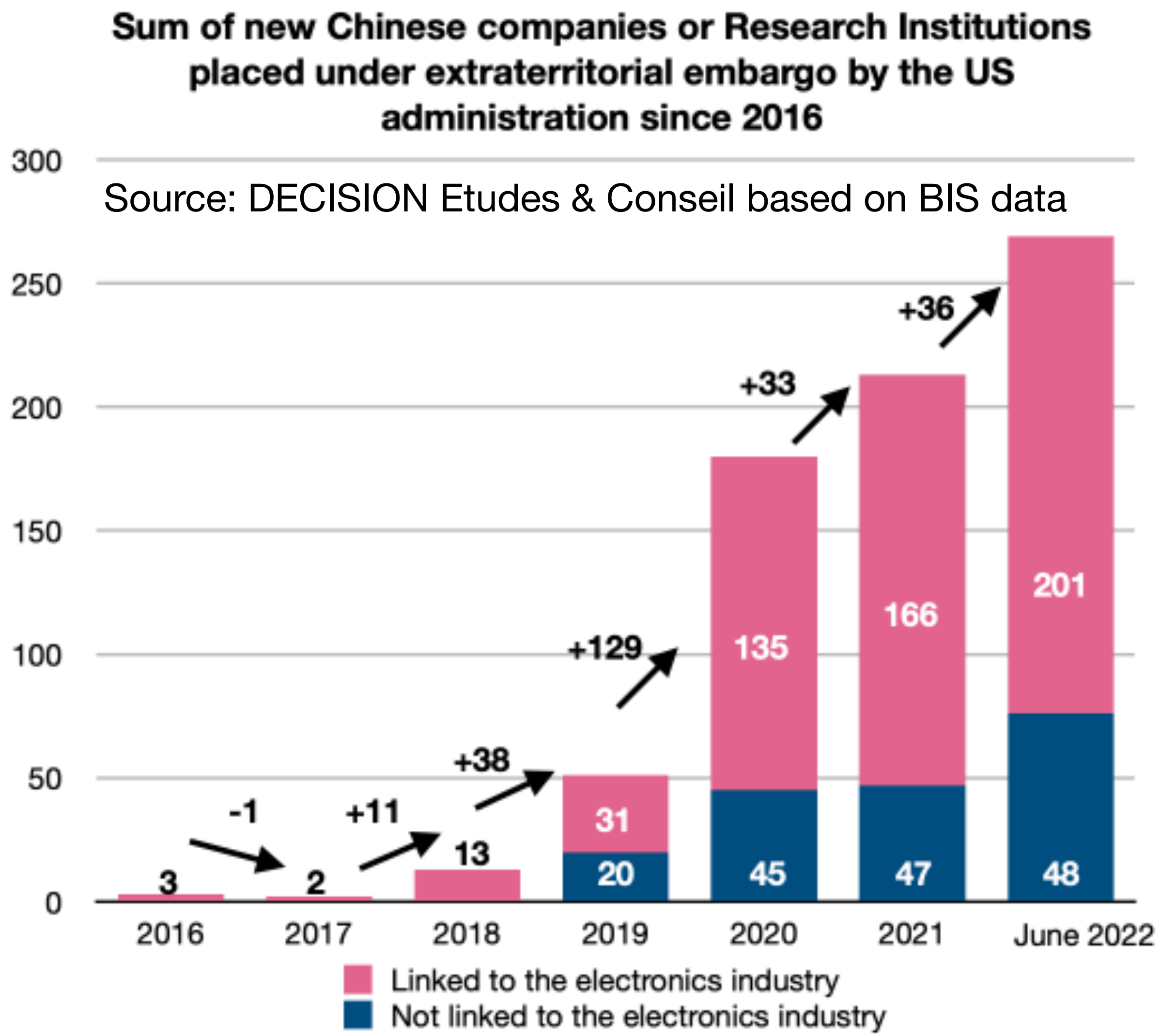
Semiconductor landscape in 2023



Source: DECISION Etudes & Conseil, SEMI

Summary of the export ban list on China from the US



- ➢ Increasing every year

2) Overview of the EU semiconductor ecosystem

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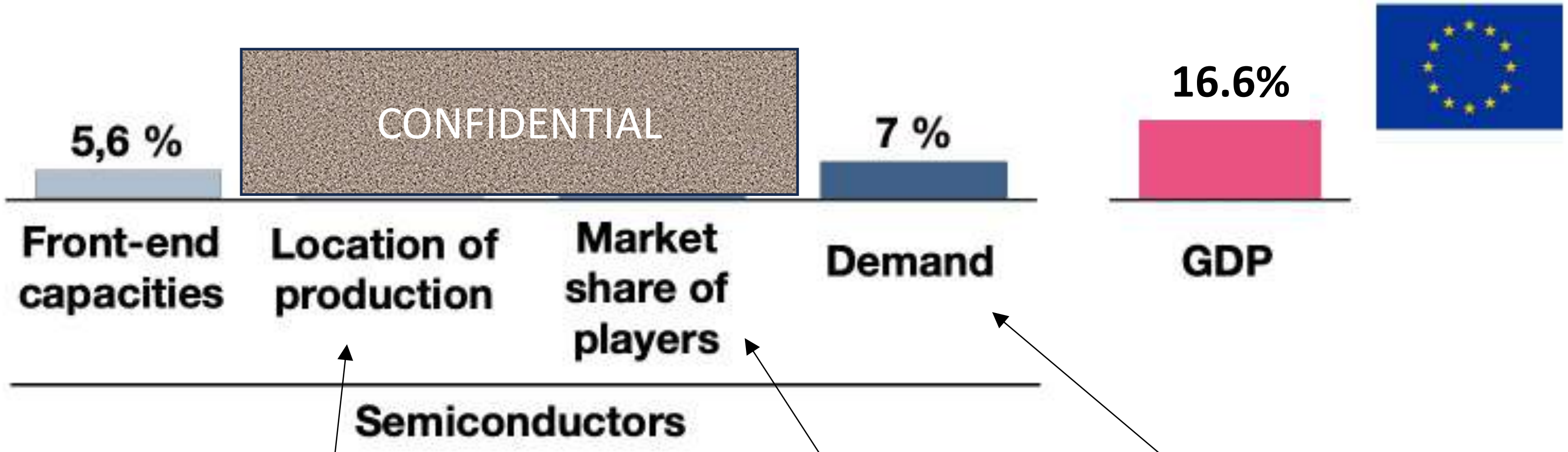
Economic context of the industry in the EU

Position of the EU in the World, 2022



Installed front-end capacities of wafers (200mm equivalent) on EU27 soil

Source: SEMI

Percentage of employees on EU soil from any company, from raw wafers manufacturers to fabless.

Example: Intel's share of employees on EU soil

Source: DECISION Etudes & Conseil

Semiconductors purchased from EU soil

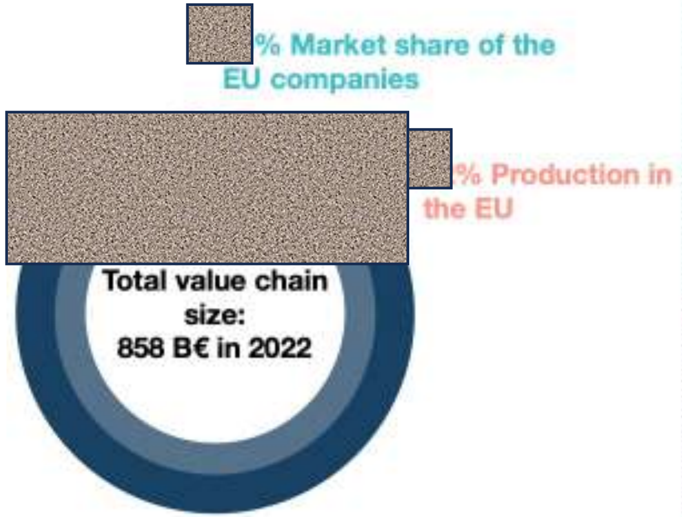
Source: WSTS

Market share of companies EU-owned, from raw wafers manufacturers to fabless.

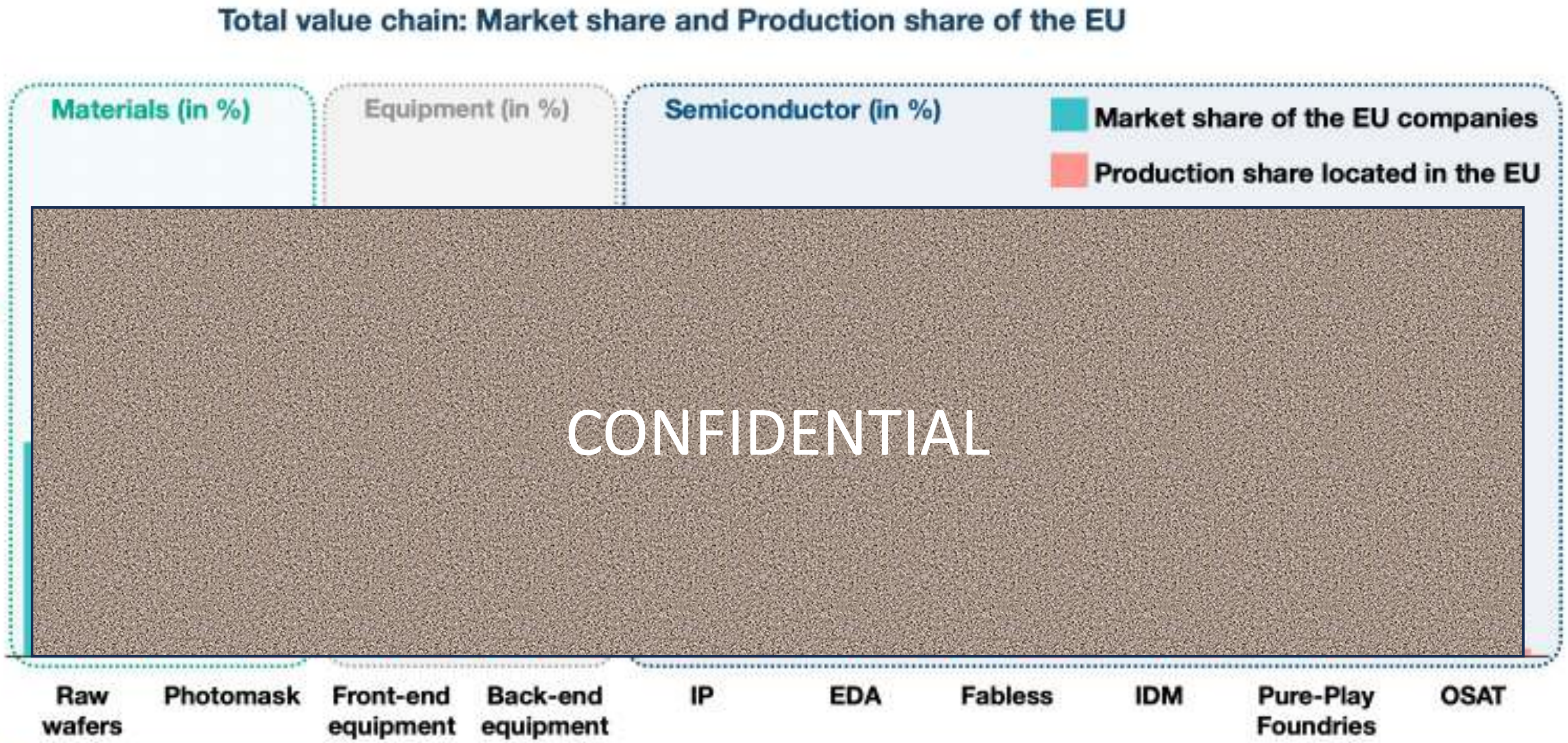
Example: ST Micro's global market shares

Source: DECISION Etudes & Conseil

Market and production shares of EU players in 2022



Source: DECISION Etudes & Conseil



Global market size	16 B€	2.5 B€	96 B€	12 B€	6 B€	8 B€	168 B€	377 B€	127 B€	44 B€

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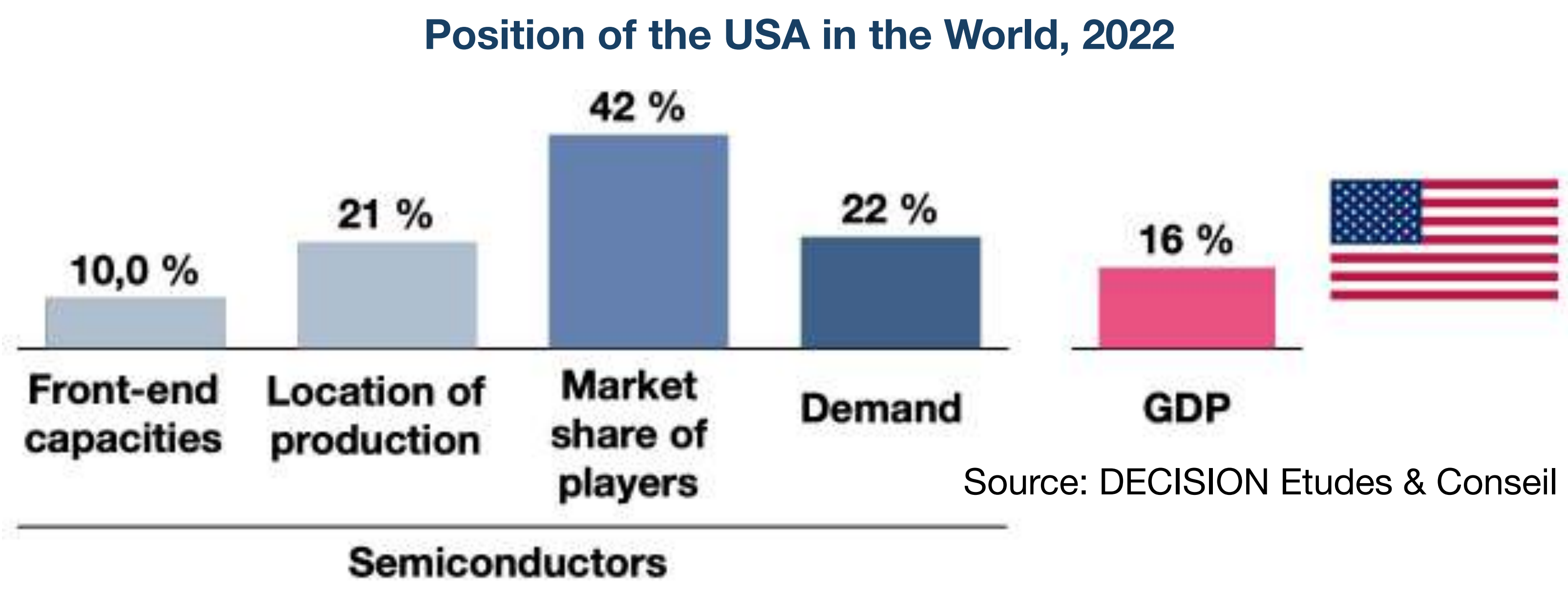
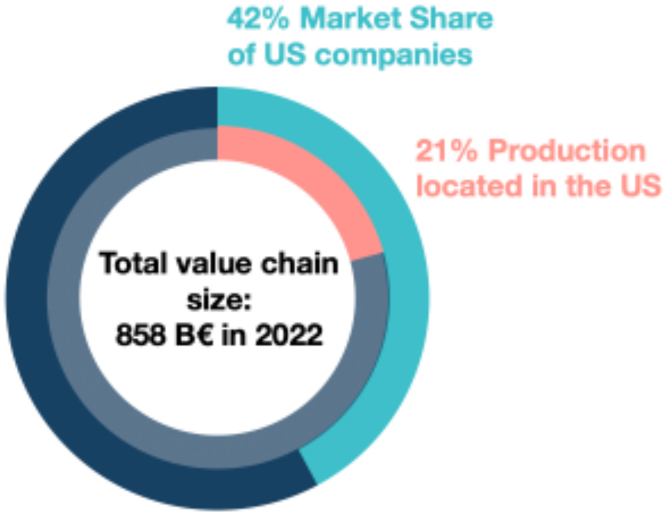
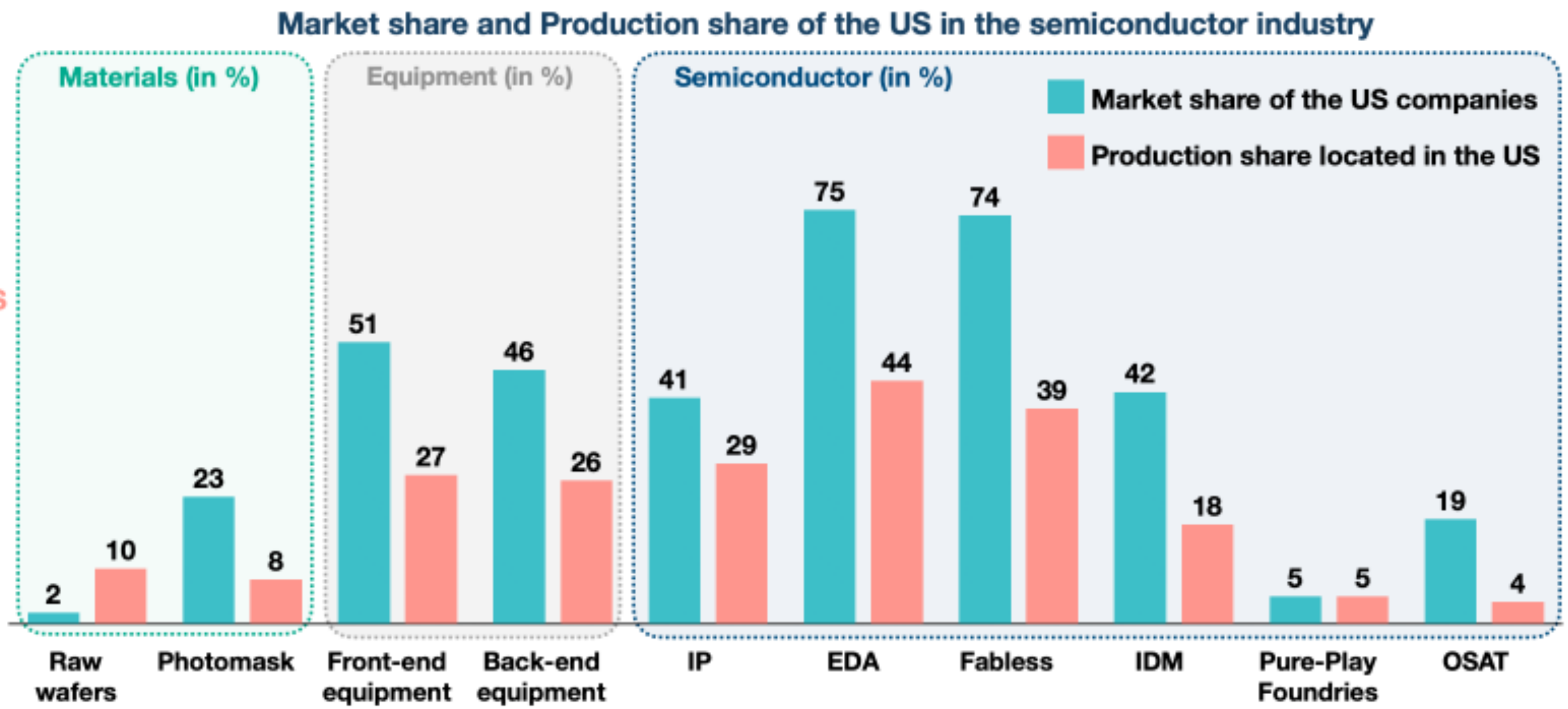
Illustration with the USA



Source: DECISION Etudes & Conseil

Market and Production share of the US companies





Global market size	16 B€	2.5 B€	96 B€	12 B€	6 B€	8 B€	168 B€	377 B€	127 B€	44 B€

Source: DECISION Etudes & Conseil

- ➢ A strong presence in the whole value chain, except on pure-play foundries

The EU semiconductor market

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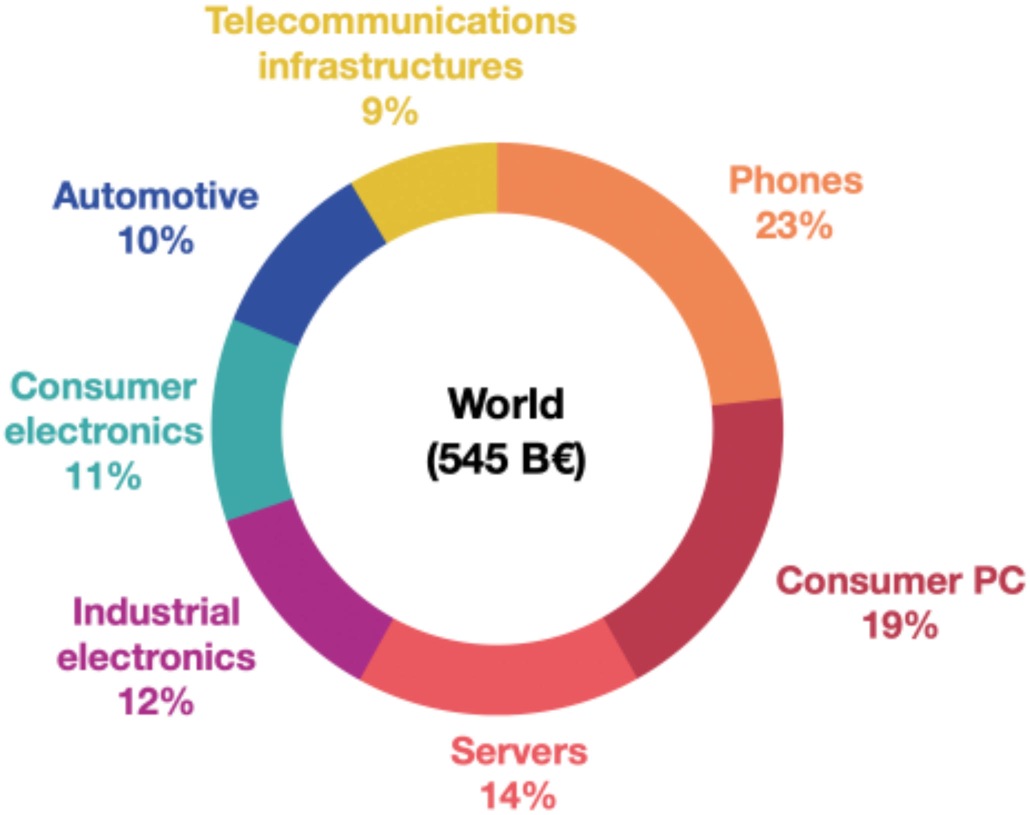
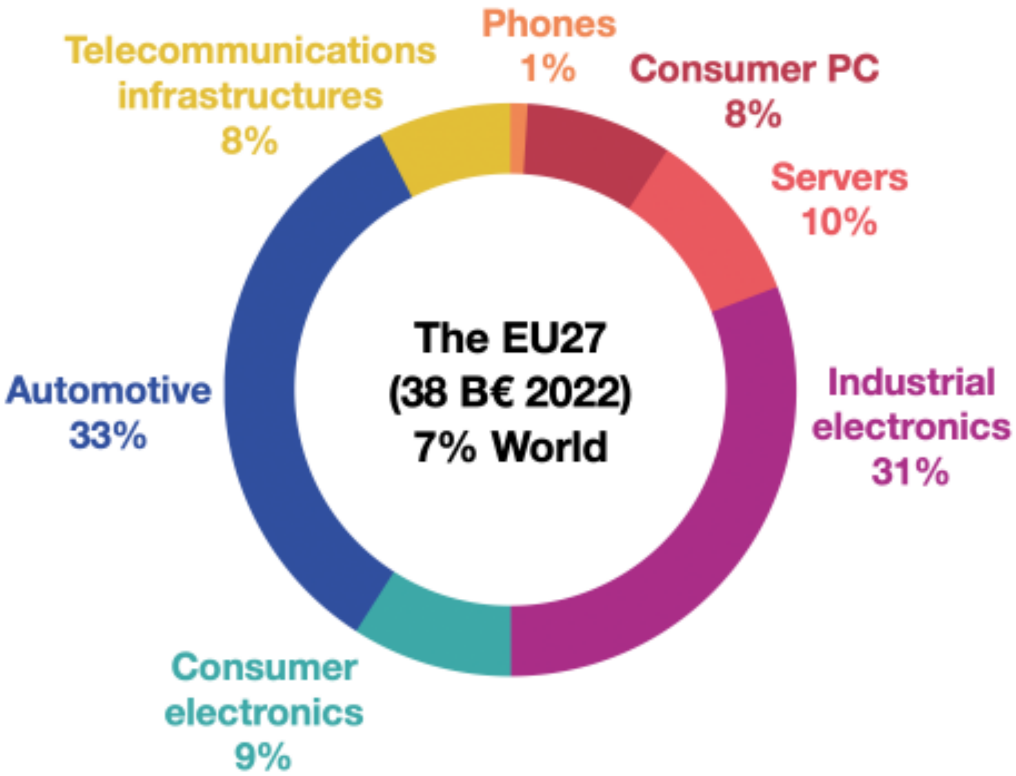
Description of the semiconductor demand in the EU by application

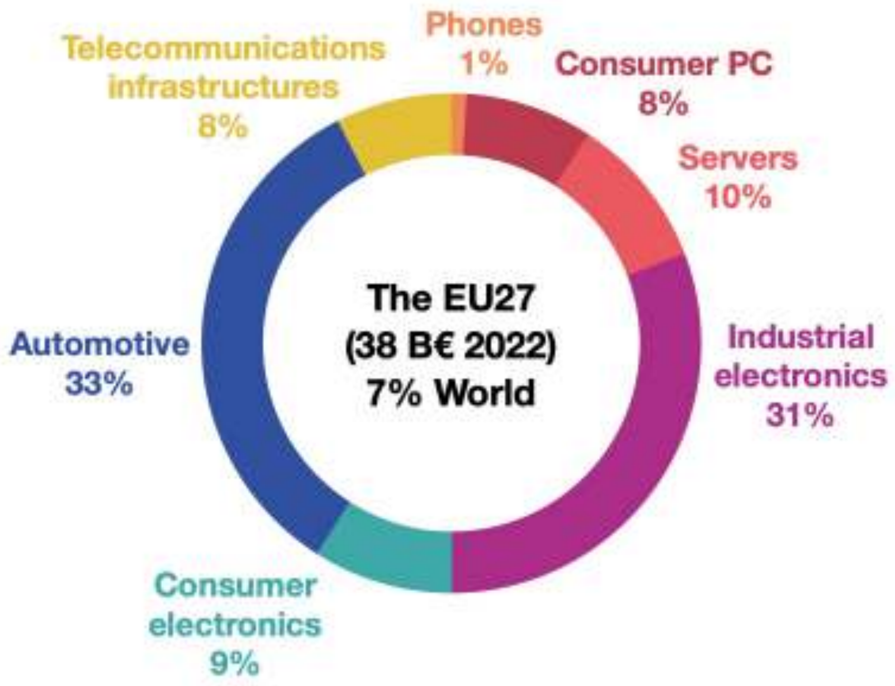
- Historical strengths in automotive and Industrial electronics
- Weak presence in ICT segments (Information and communication technologies)

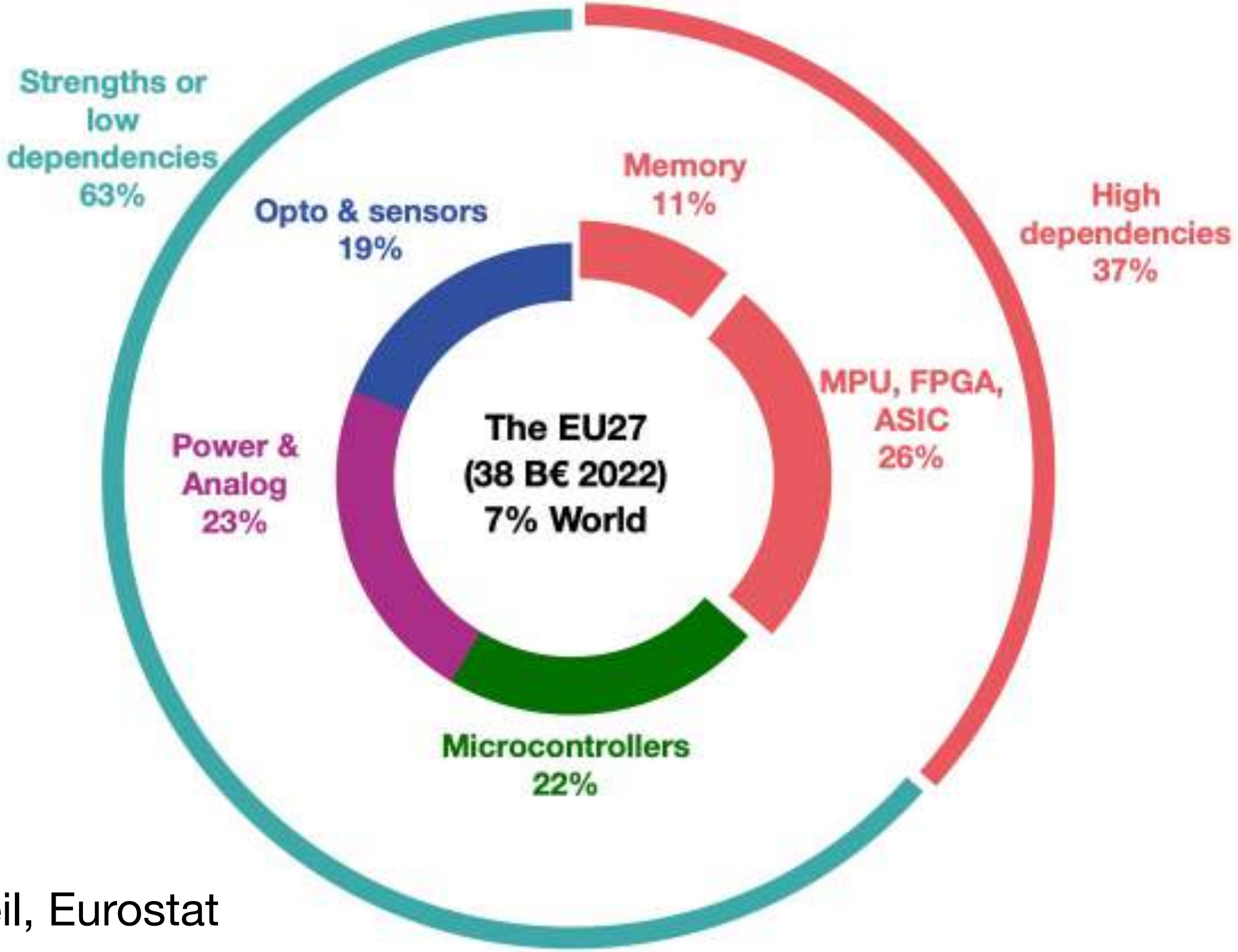




Source: DECISION Etudes & Conseil, WSTS, Eurostat

Description of the semiconductor demand in the EU by application and products





Source: DECISION Etudes & Conseil, Eurostat

Towards a strategic dependence on the US in terms of processors and memories

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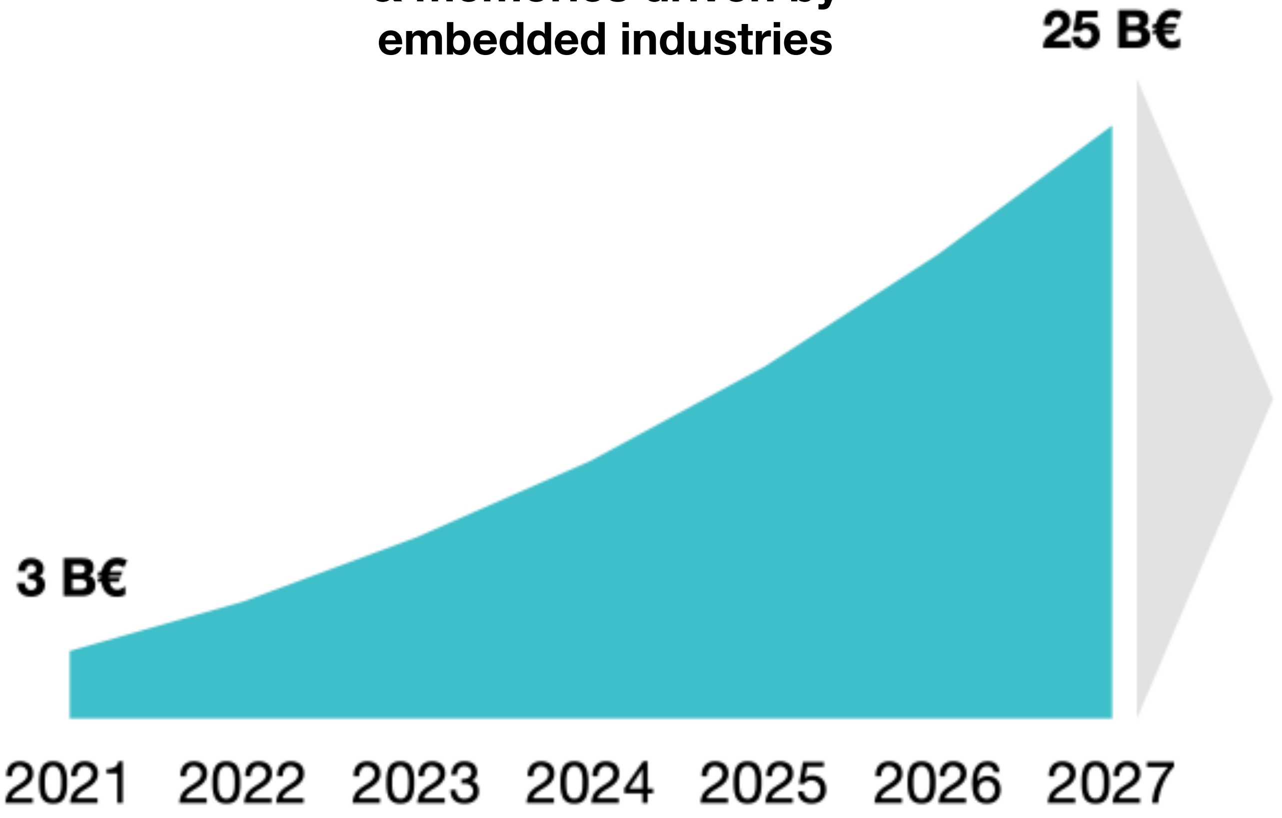
The EU market for processors & memories driven by embedded industries



Source: DECISION Etudes & Conseil

EU industries demand for:

- Processors: MPU, logic, SoC, SiP
- Memories: Flash NAND, DRAM

Driven by embedded industries:

- Automotive
- Industrial & robotics
- Health & Care
- Aerospace / Defense / Security

EU dependence towards the US

intel NVIDIA AMD Qualcomm

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The EU semiconductor industry

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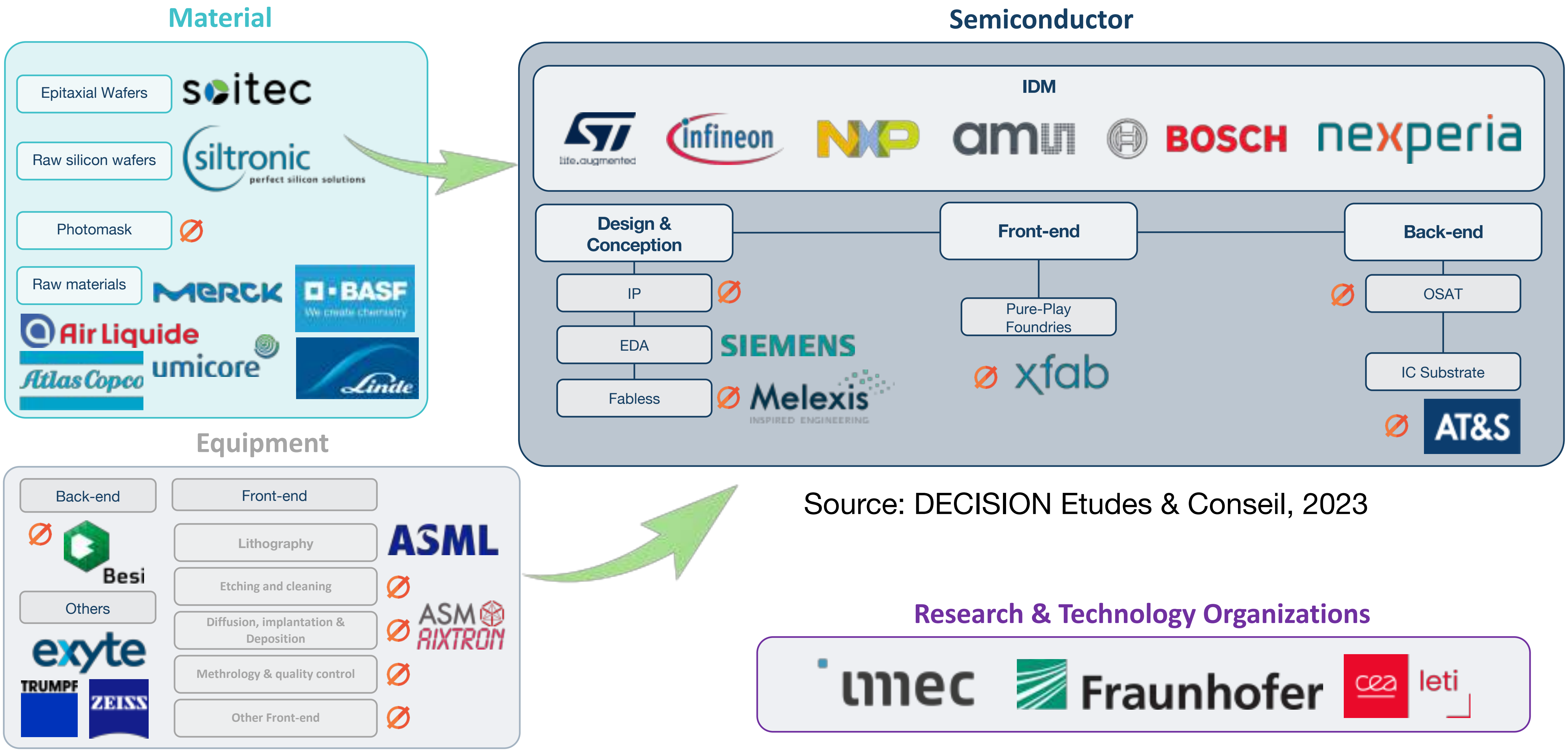
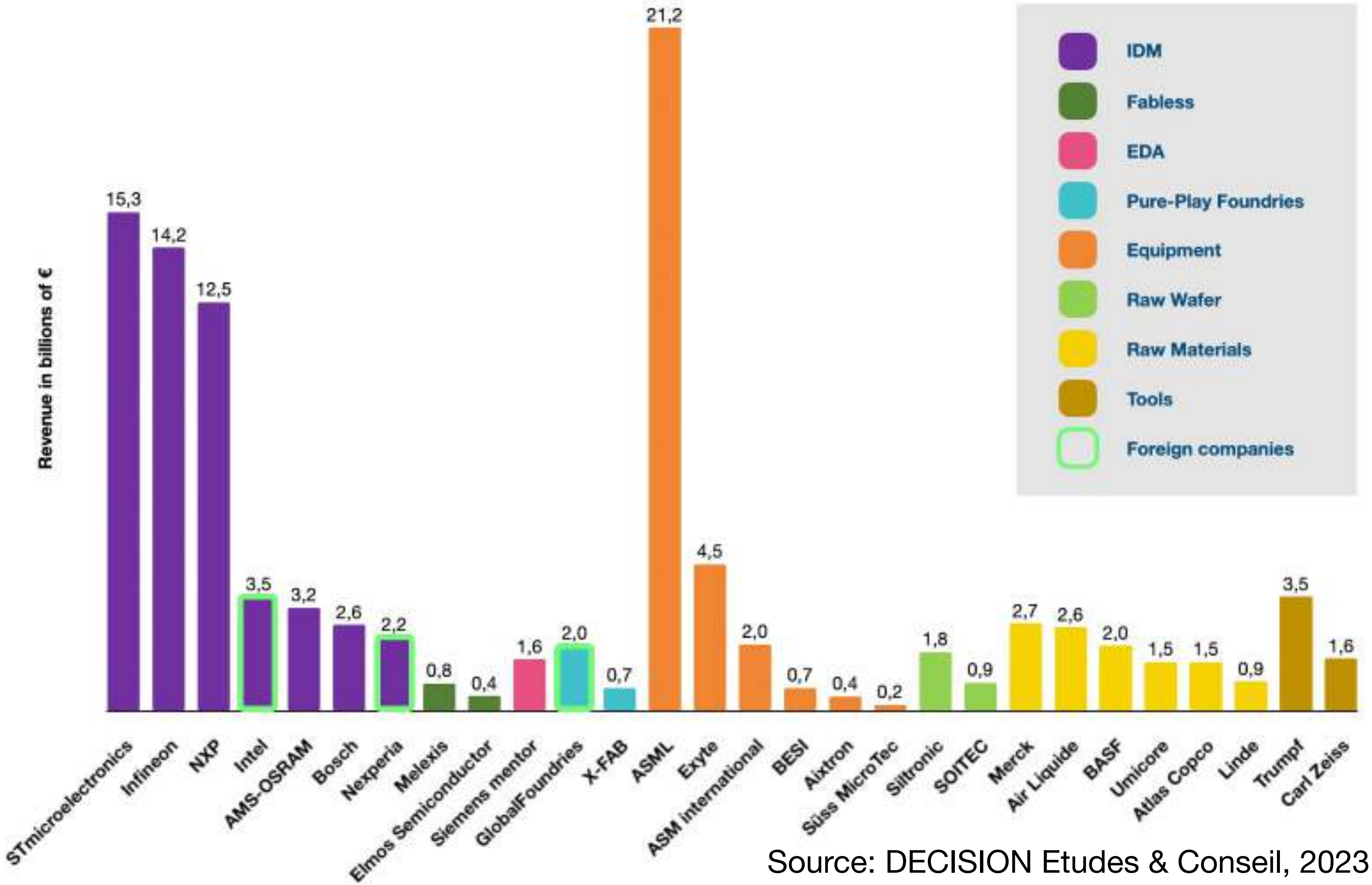
EU leaders in the semiconductor value chain



Source: DECISION Etudes & Conseil, 2023

EU leaders in the semiconductor value chain, 2022



Source: DECISION Etudes & Conseil, 2023

EU Skills shortage

ECSA

Profiles the most sought-after and difficult to fill on the European job market

Since 2020 :

3 new job profiles in the top 5

1 new critical job profile

Take the survey for 2024

Deadline: End of the week

Source: DECISION Etudes & Conseil

EU International trades of semiconductors

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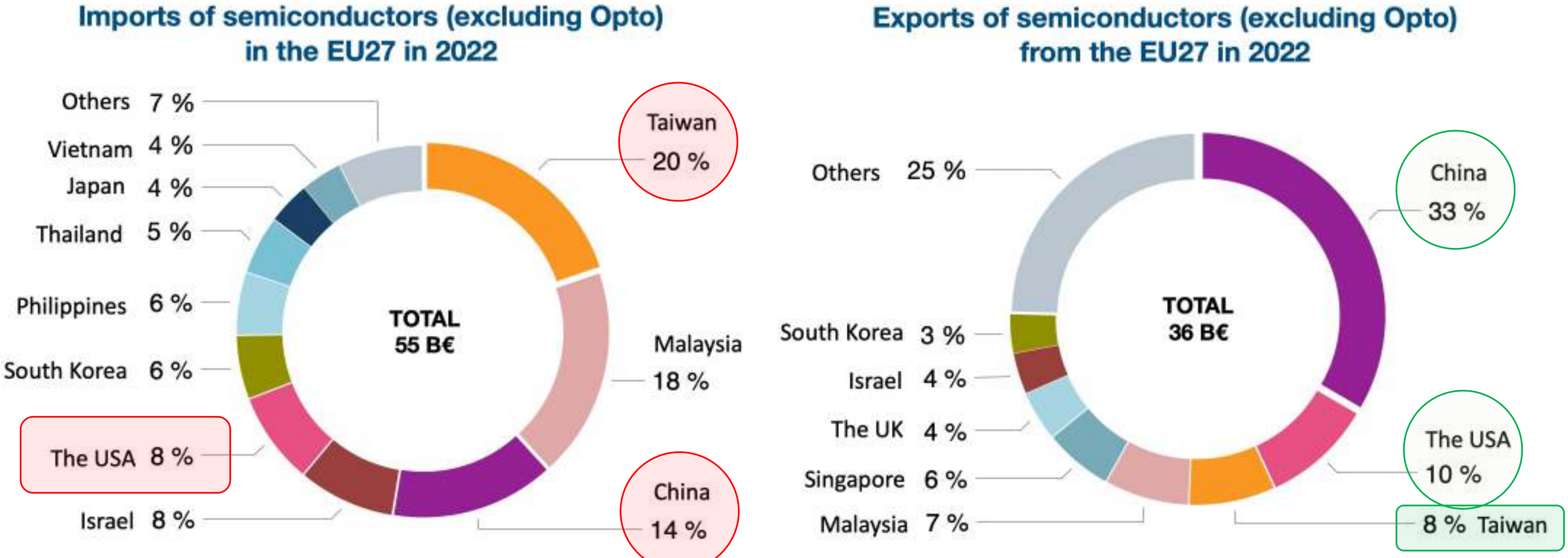
Semiconductor trade partners of the EU (by location)



Source: DECISION Etudes & Conseil, Eurostat, 2023

Ongoing investments in the EU

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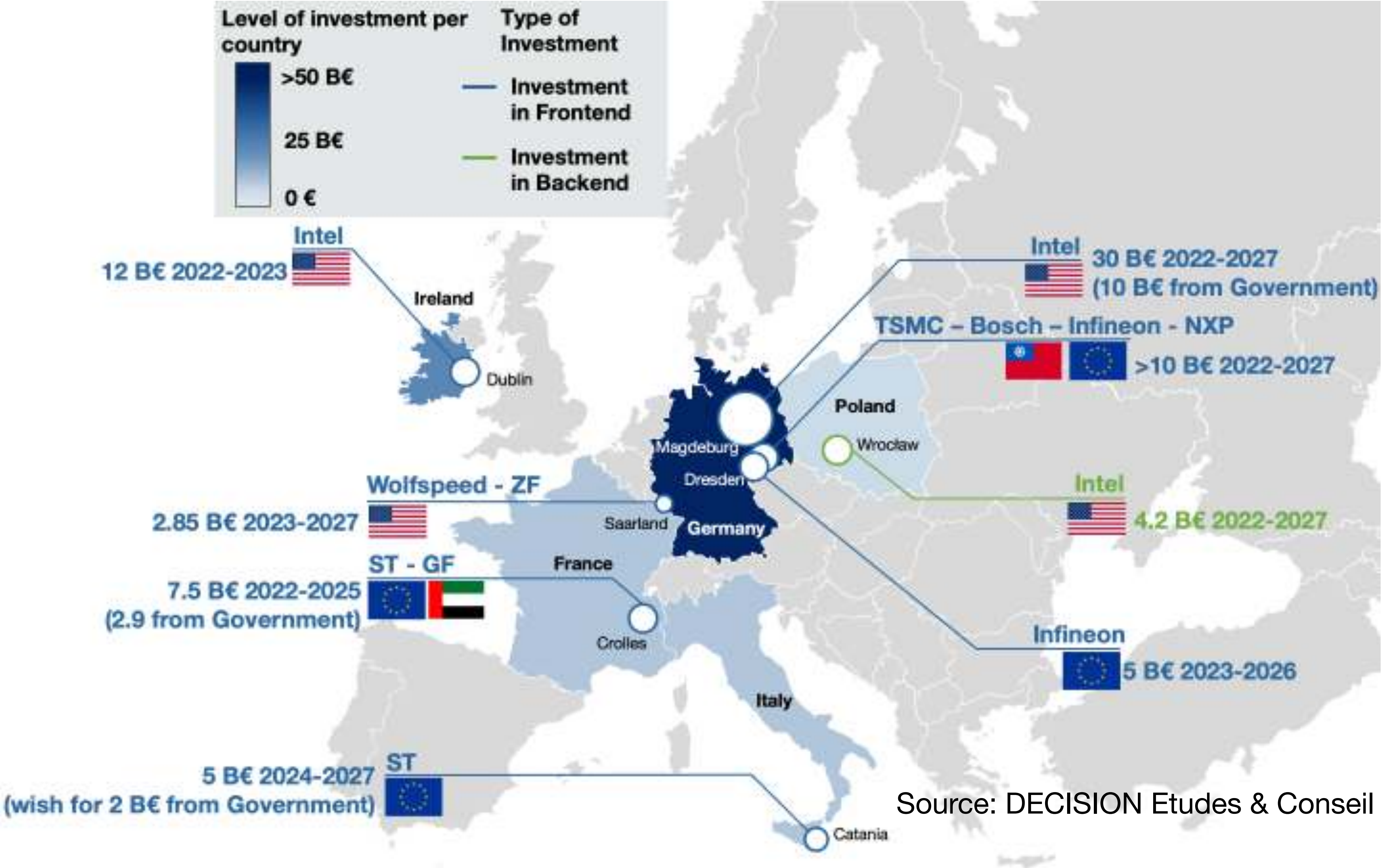
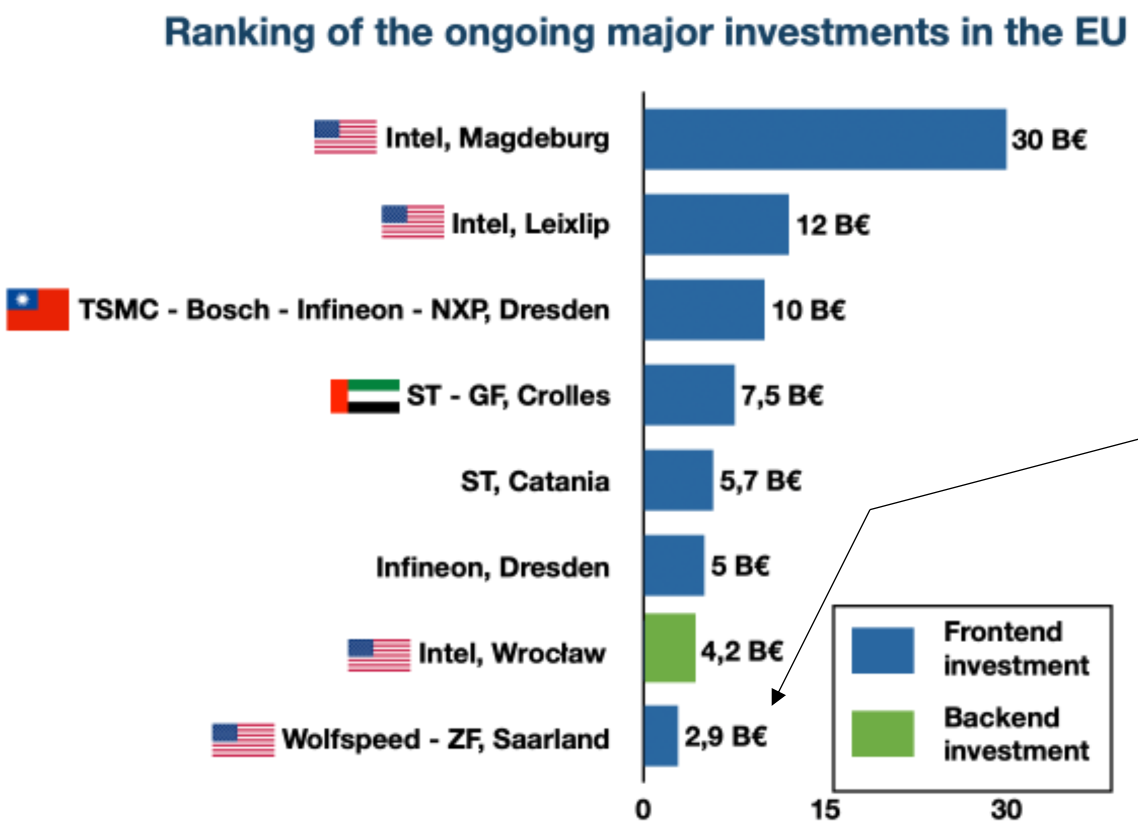
Key investments in the EU



Source: DECISION Etudes & Conseil

- 58% of investments from US companies

Key investments in the EU from 2023



Source: DECISION Etudes & Conseil

+3.2 B€ in Italy from the Taiwanese Silicon Box

Back-end

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Strengths and dependencies

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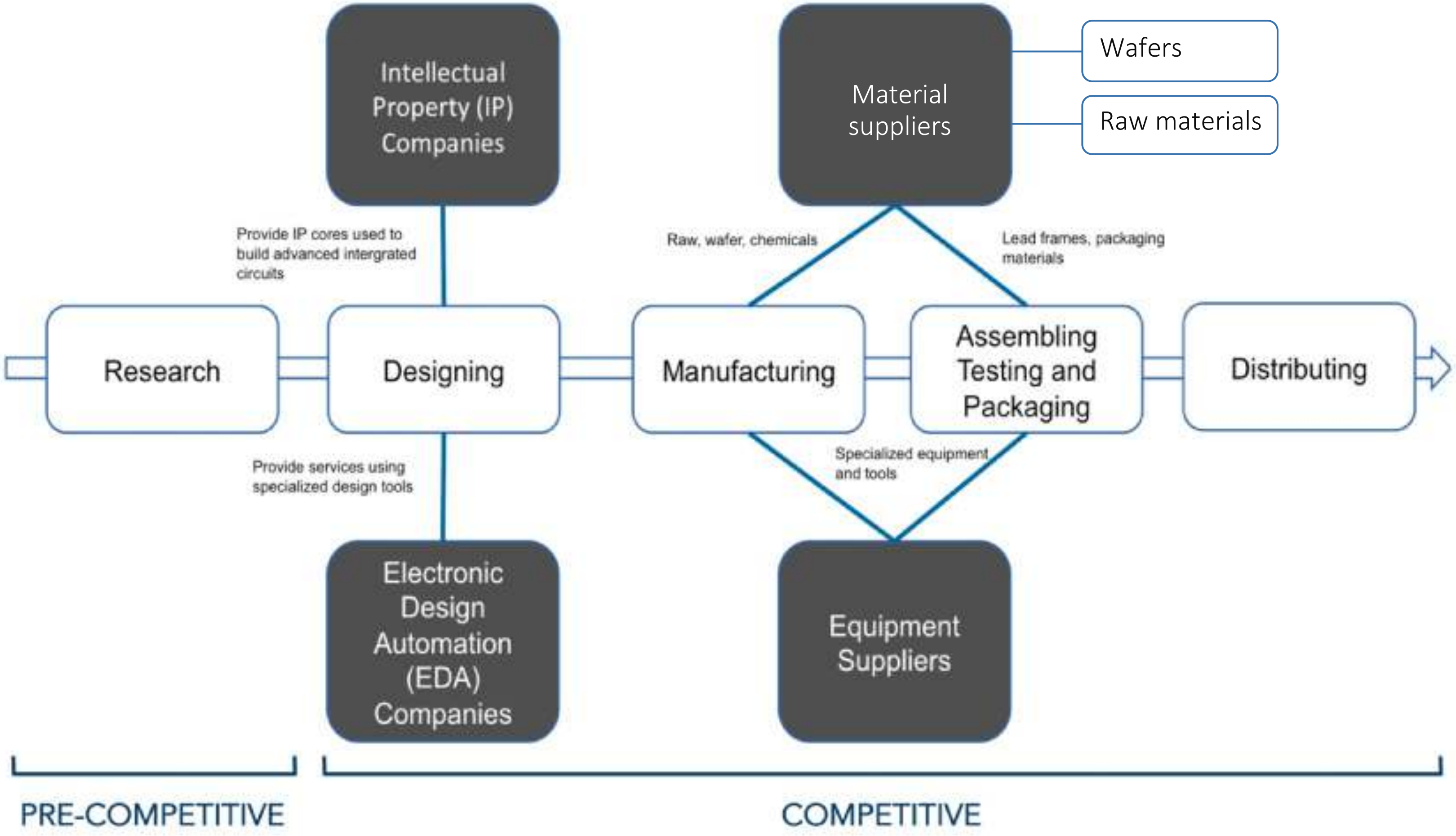
EU strategic dependencies



Source: DECISION Etudes & Conseil, ESIA

Weaknesses

Strategic dependencies

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3) Our approach to identify areas for bilateral R&D cooperation

Baseline - Review per country & region

International Cooperation On Semiconductors

Qualitative Review

Quantitative Review Key figures

Strengths & Dependencies

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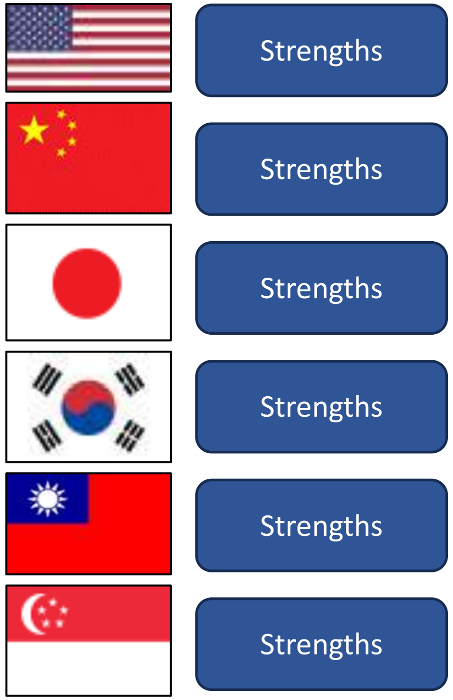
Approach - Criterium 1: Leverage mutual strengths

Strengths

- ❑ High end lithography equipment
- ❑ Leadership in sensors, power electronics, nano optics, and imaging
- ❑ SOI wafer materials
- ❑ …

Leveraging mutual strengths



- Which region/which country ?
- Which part of the value chain ?
- Which product/technologies ?

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Approach - Criterium 2: Crossed cooperation

Weakness / Strategic dependency

Strength

Strength

Weakness / Strategic dependency

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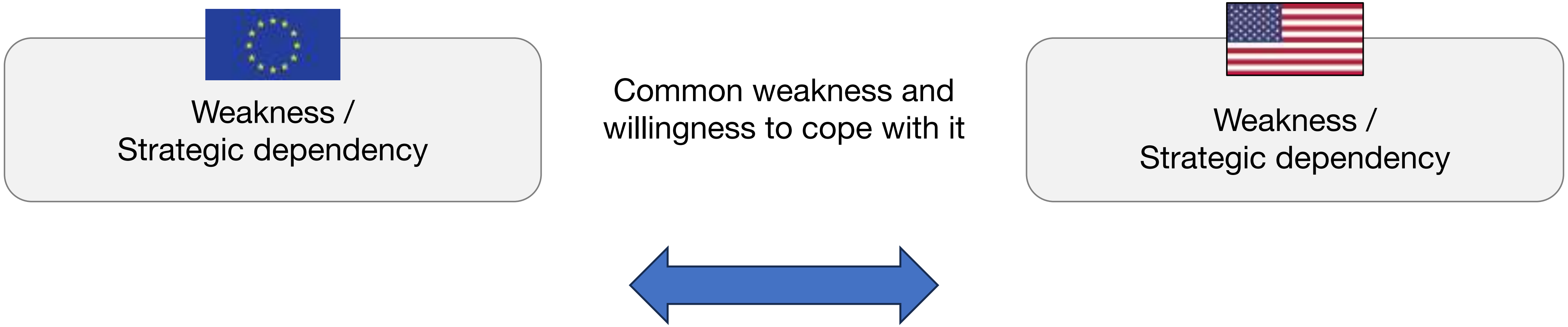
Approach - Criterium 3: Bridge mutual weaknesses



Léo Saint-Martin | Partner

Phone | +33 (0) 1 45 05 70 13

Email | saint-martin@decision.eu

Website | www.decision.eu

Address | 17 rue de l’Amiral Hamelin
75116 Paris, France

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