The EU Semiconductor Strategy: Adapting to a Changing Geopolitical Landscape

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Agenda

1. Semiconductor, the World’s Most Globalized Sector
2. 1990s - 2020s: A shifting Geopolitical Environment
3. Semiconductor: The rise of China and US attempts to contain it
4. Status of trades in semiconductor in this changing environment
5. The EU semiconductor strategy, Adapting to a Changing Geopolitical Landscape

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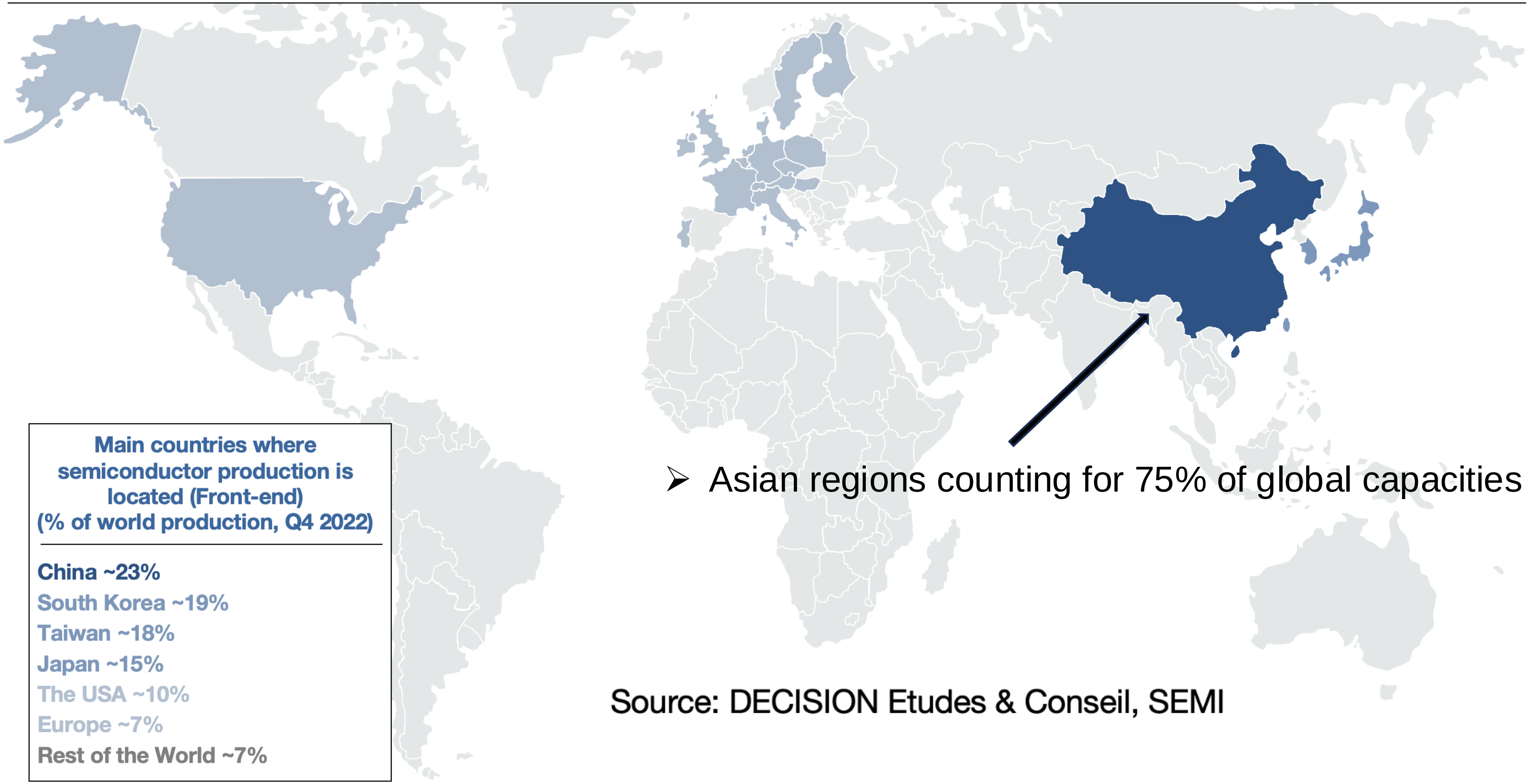
Overview of the Semiconductor Industry

The World's Most Globalized Sector

Semiconductor front-end manufacturing installed capacities in 2023



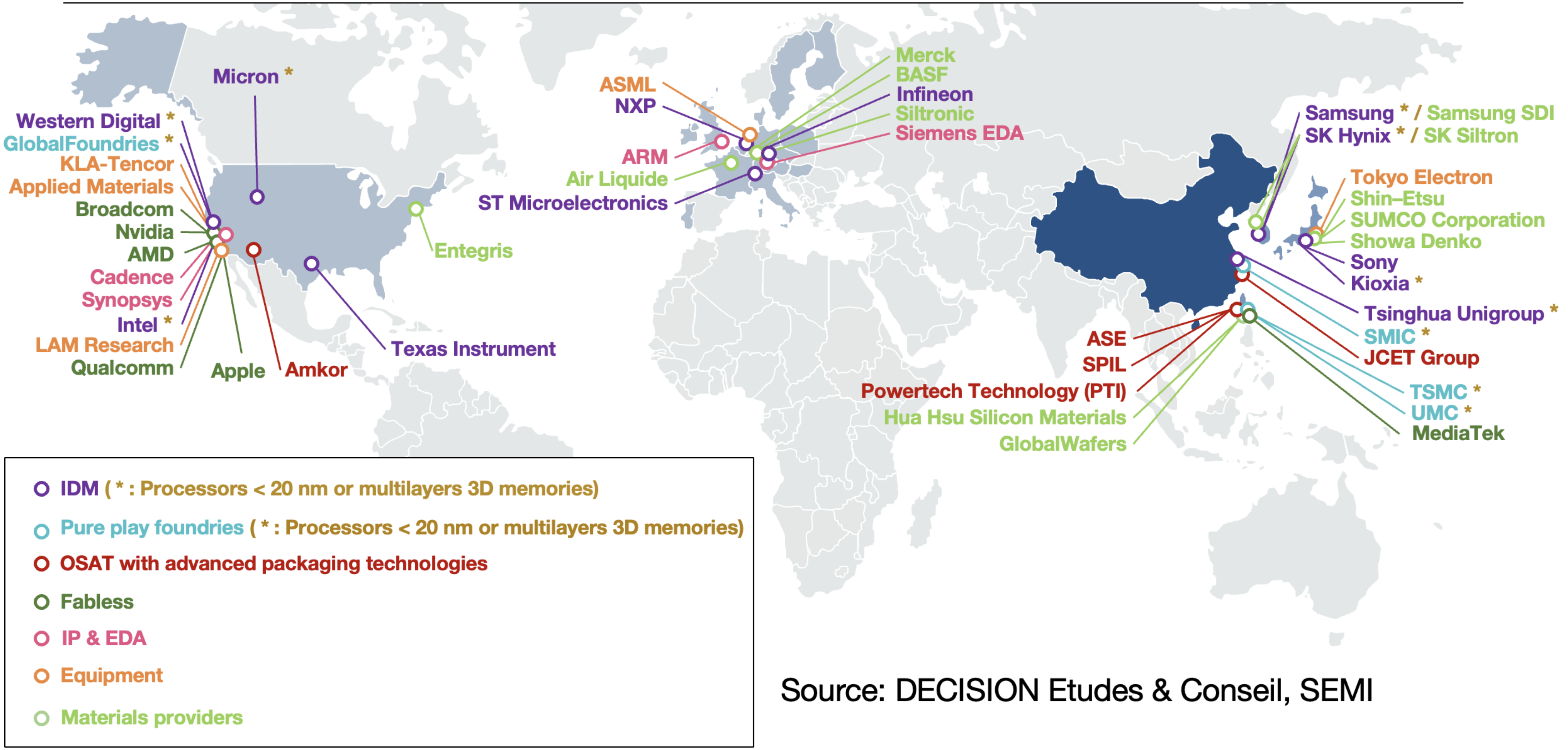
Main countries where semiconductor production is located (Front-end)
(% of world production, Q4 2022)

China ~23%
South Korea ~19%
Taiwan ~18%
Japan ~15%
The USA ~10%
Europe ~7%
Rest of the World ~7%

- Asian regions counting for 75% of global capacities

Source: DECISION Etudes & Conseil, SEMI

Semiconductor landscape in 2023



Source: DECISION Etudes & Conseil, SEMI

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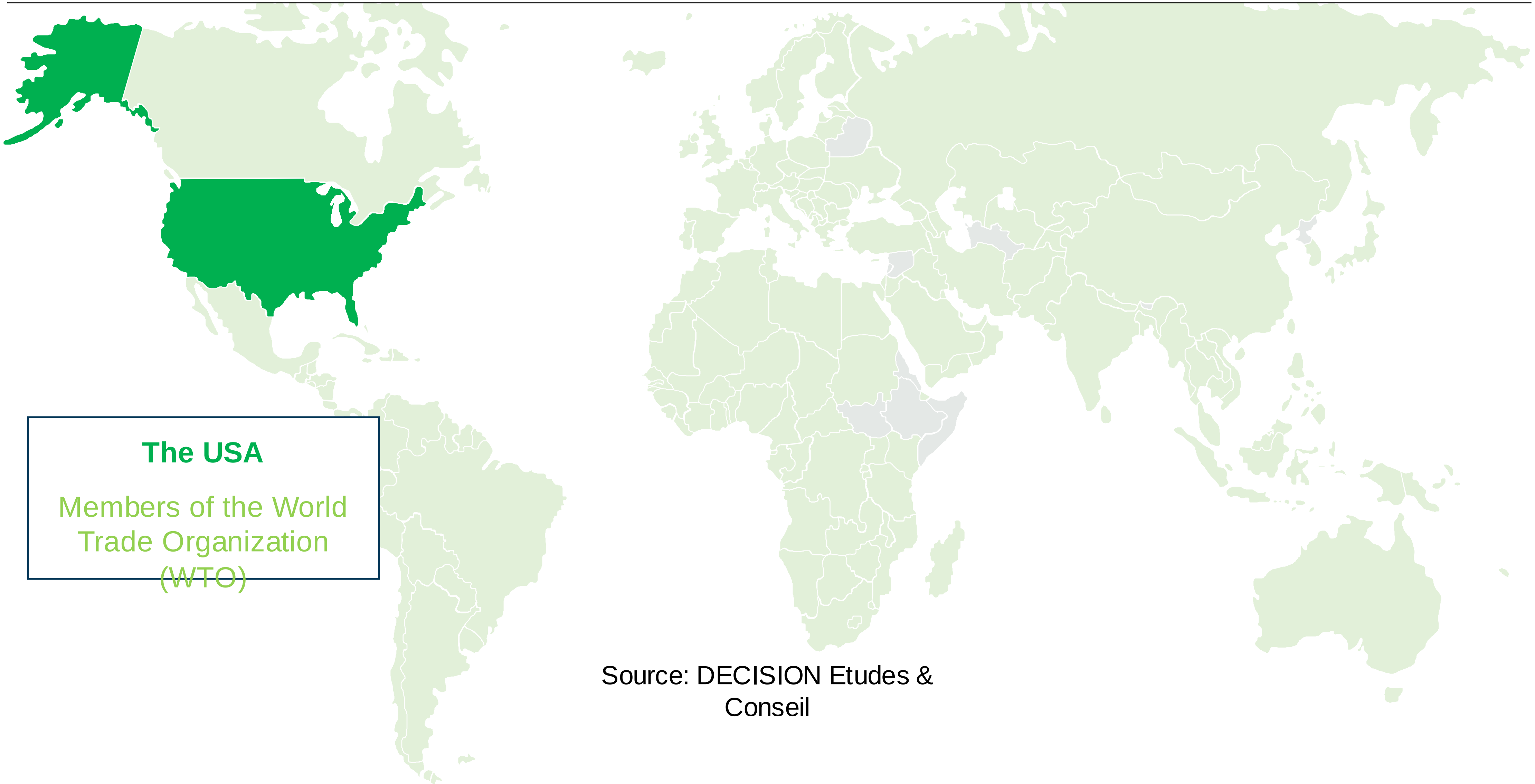
1990s – 2020s

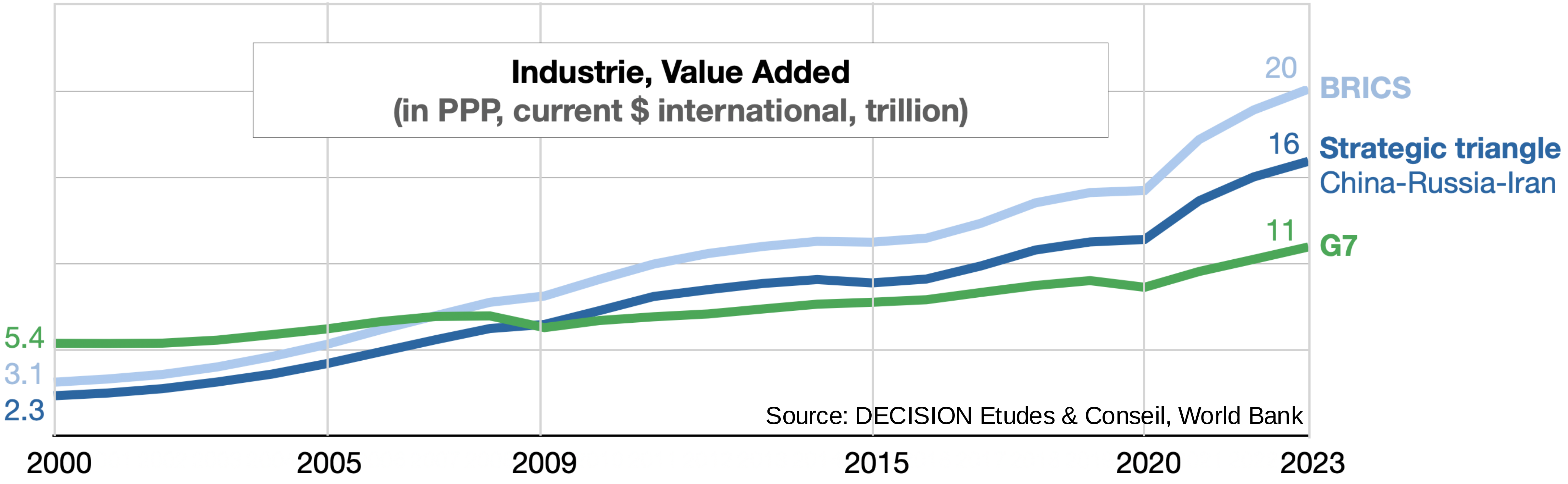
A shifting Geopolitical Environment

Globalization in a unipolar World (1991-2014)



Source: DECISION Etudes & Conseil

Towards multipolarity (2000-2023)

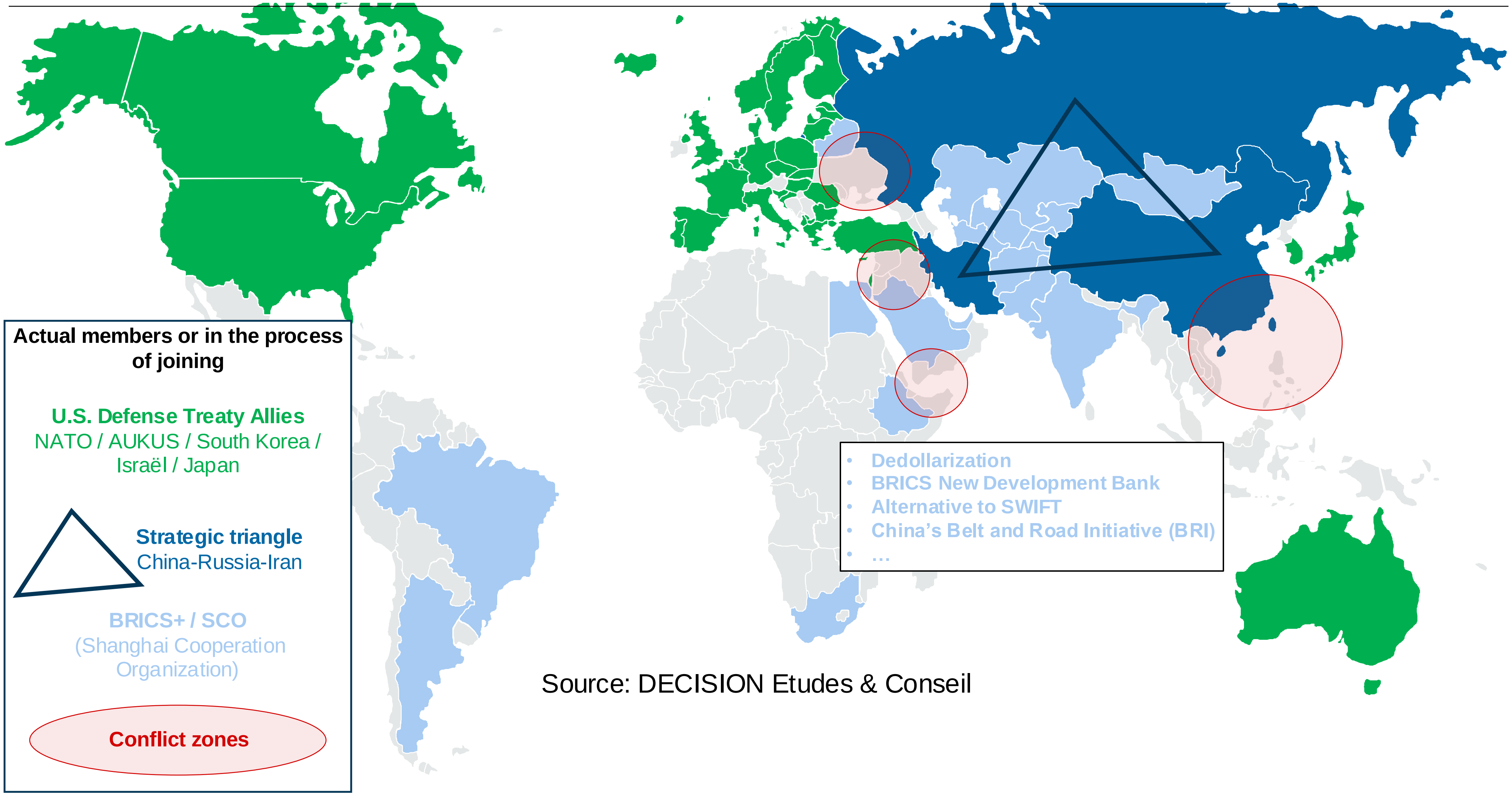


2014
Annexation of Crimea by Russia
New Development Bank of the BRICS

2019
U.S. Blockade of the WTO Appellate Body

2001
Creation of the Shanghai Cooperation Organization

Towards a logic of blocks? (2014-?)



Source: DECISION Etudes & Conseil

De-coupling? De-risking?

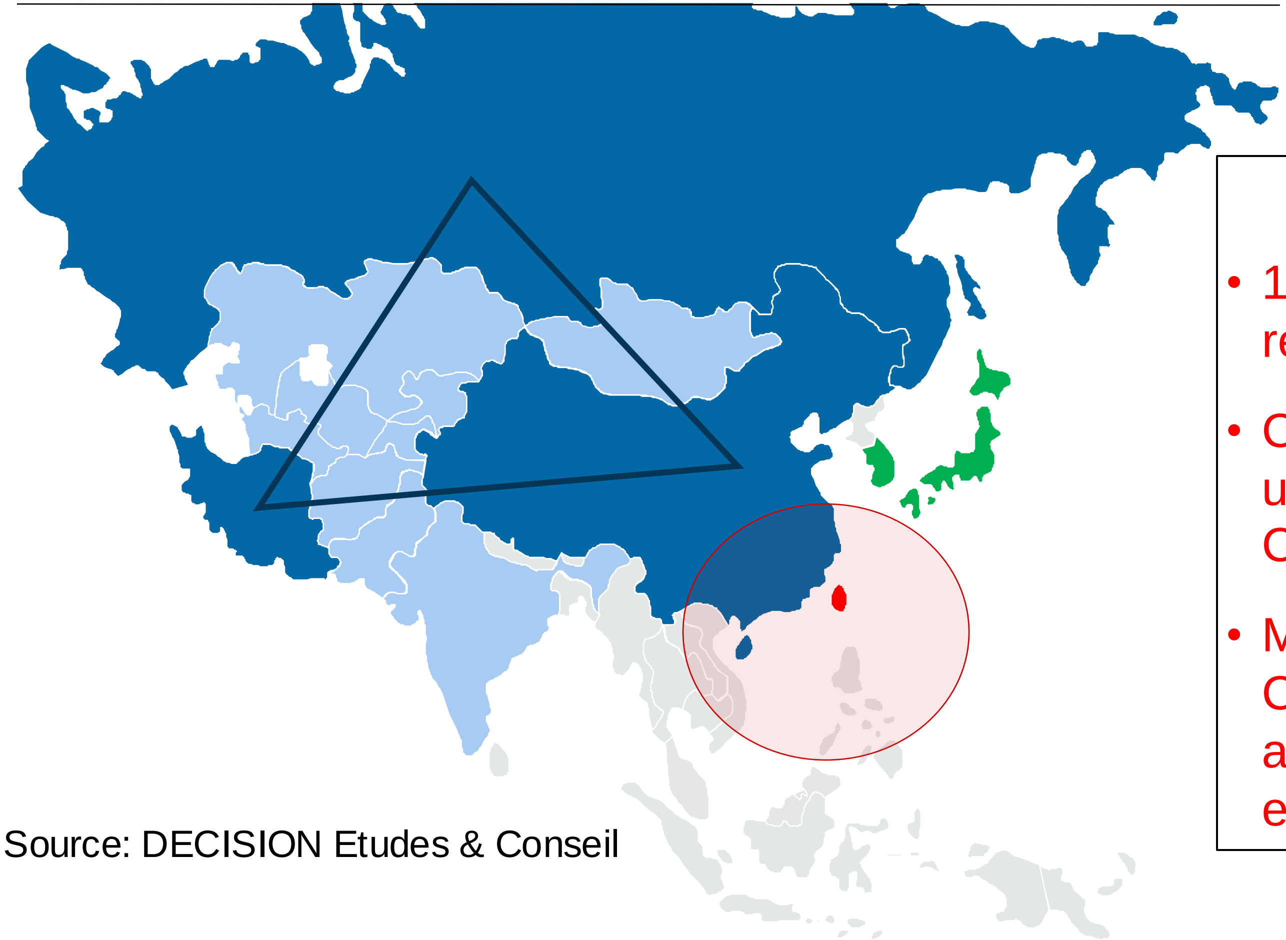
China designated by the West as

- “**Systemic rival**”, various G7 declaration since 2021
- ”**Systemic challenge**”, NATO 2022
- **Concerns about China’s non-market policies leading to spillovers, market distortions and harmful overcapacity**, G7 2024

However, the last G7 Communiqué (Apulia Leaders’ June 2024) states

- **We are not decoupling** or turning inwards. We are **de-risking** and **diversifying supply chains** where necessary and appropriate, and fostering resilience to economic coercion.
- **We further call on China to refrain from adopting export control measures**, particularly on critical minerals, that could lead to significant global supply chain disruptions.

Primary Risk of Value Chain Disruption



Source: DECISION Etudes & Conseil

Taiwan

- 1971 UN General Assembly resolution recognizing one single China
- China will “not renounce the use of force” to unify Taiwan with the People’s Republic of China
- May 2024 New Taiwanese President stating China "has no right to represent Taiwan" and his mission is to "resist annexation or encroachment upon our sovereignty.”

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Semiconductor

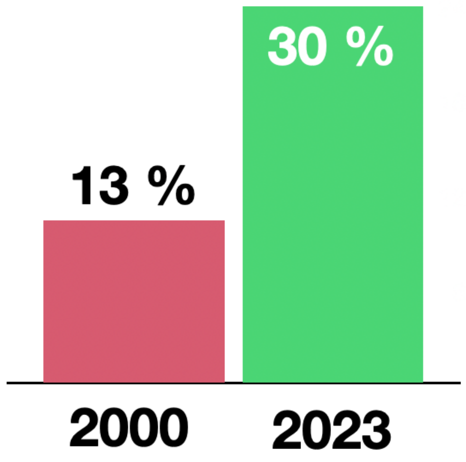
The rise of China…

…and US attempts to contains China's rise

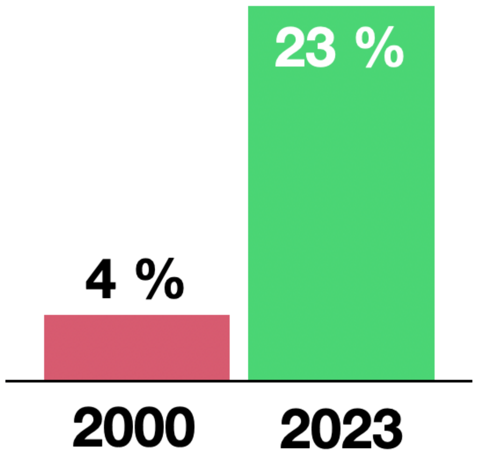
Semiconductor: The rise of China

In **2015**, China published its plan "**Made in China 2025**" where it officially announce for the first time its willingness to master the complete value chain of semiconductor.

Semiconductor market China % World



Installed capacity of semiconductor (Front-end) China % World



Across the entire semiconductor value chain in 2022

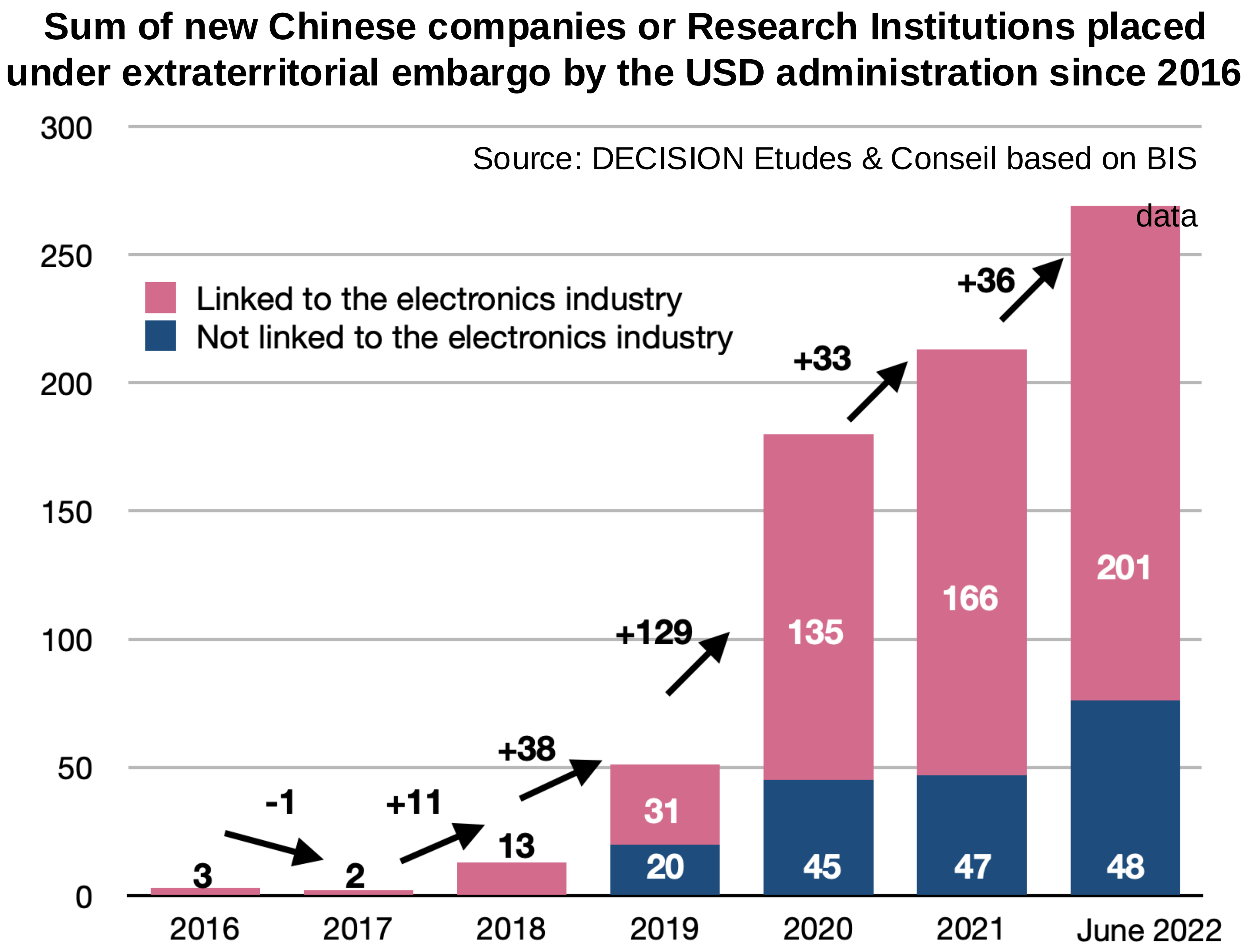
Sources: DECISION Etudes & Conseil, WSTS, SEMI

US attempts to contains China's rise

US industrial policy tools to contain China's rise

- **FCPA (Foreign Corrupt Practices Act) (2008↑)**: The use of foreign corrupt practices to weaken key non-US companies and eventually purchase them.
- **BIS Entity list (2016 ↑)** : Entities and products placed under extra-territorial embargo.
- **FIRRMA (Foreign Investment Risk Review Modernization Act) / CFIUS (2018)** to monitor and control foreign investments, including in semiconductors: Qualcomm, Aixtron, Lattice Semiconductor, Siltronic, Western Digital, Lumileds…
- **Inflation Reduction Act (IRA) (2022).** $369B by 2031 public funding, requiring domestic content ranging from 40% to 100% for different components and sectors to qualify for full subsidies and tax incentives.
- **Expansion of export control measures (dual use)**
- **Trump elected:** Universal tariff of 60% on all Chinese imports?
    - Possible retaliation from China: Export controls on critical minerals? Following Gallium and Germanium

Summary of the export ban list on China from the US



➢ Increasing every year

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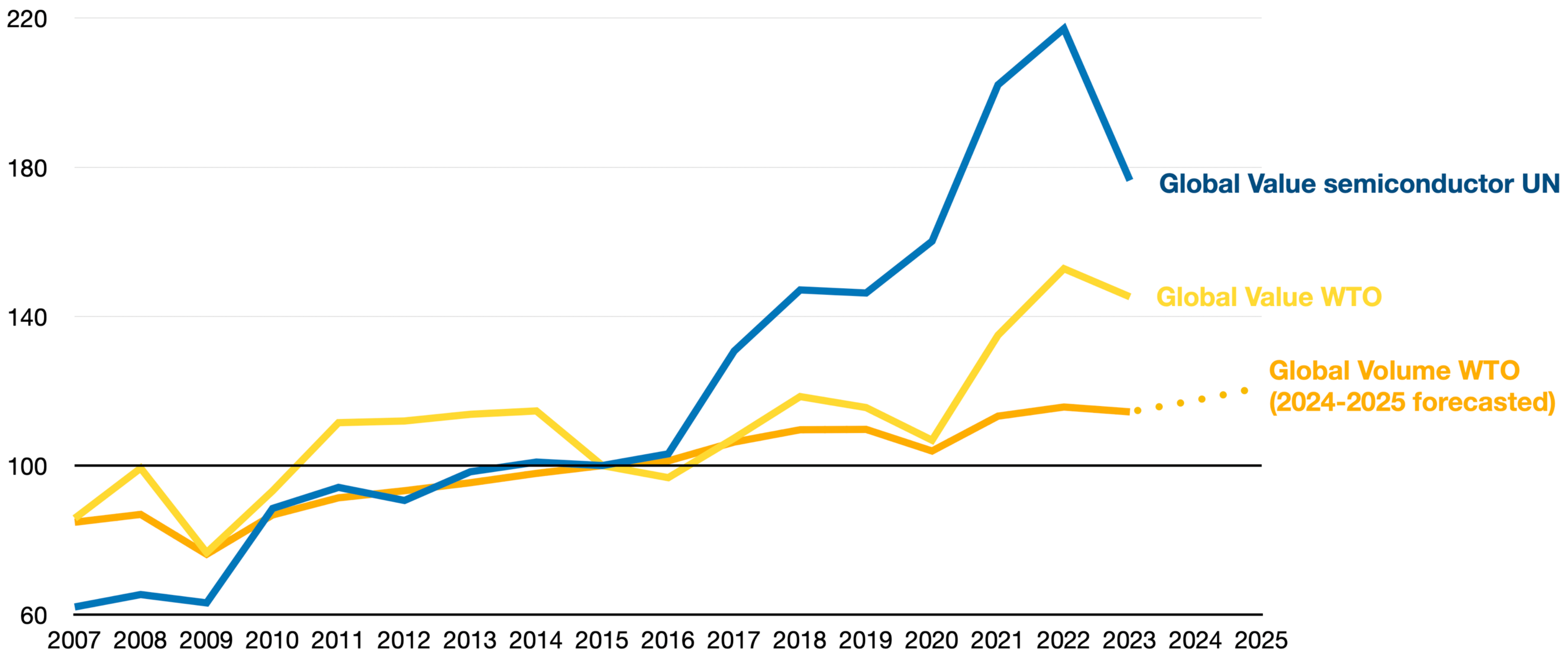
Status of trades in semiconductor

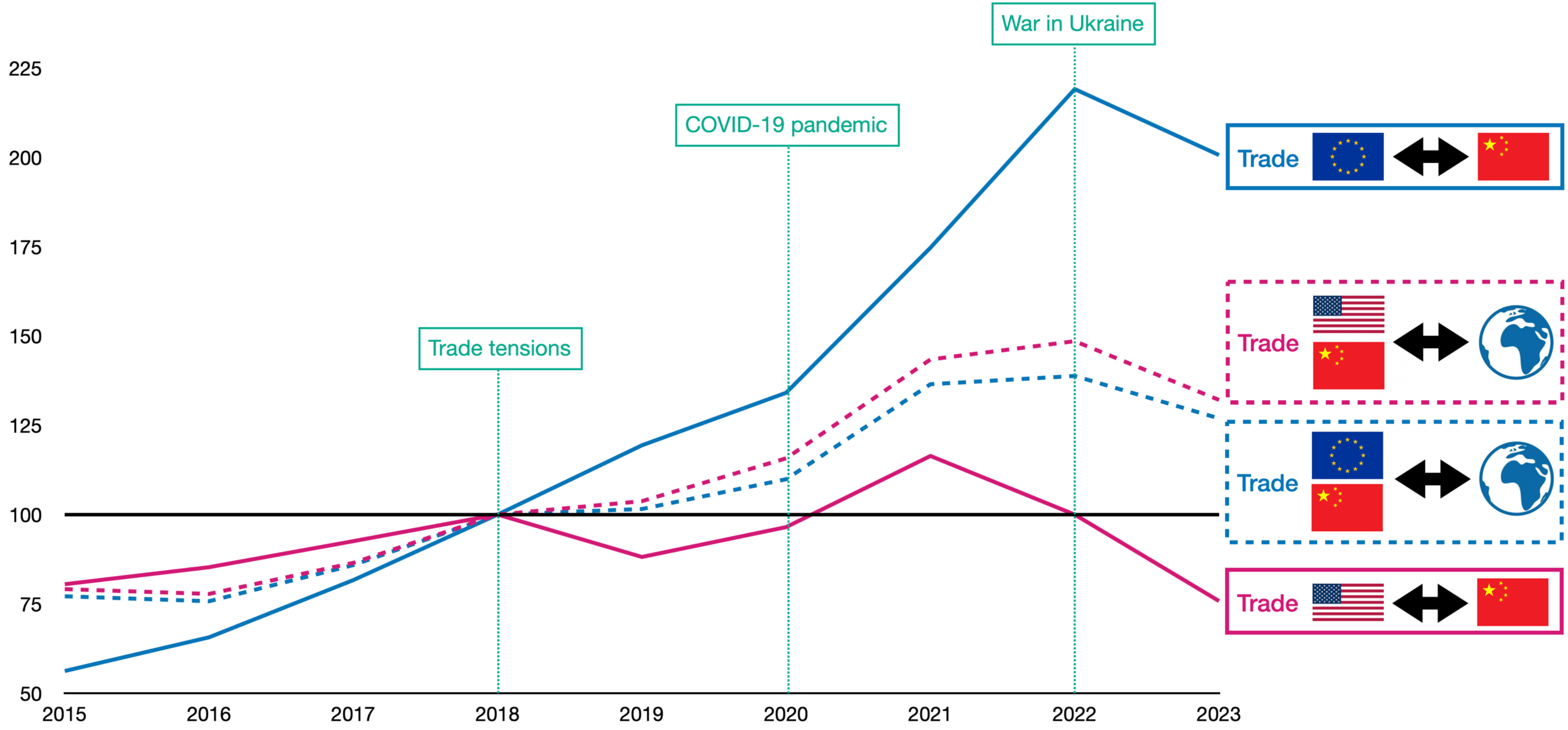
in this changing environment

Evolution of Overall Global Trade Value/Volume
and Semiconductor Global Trade Value in the World
(Indexed to 2015)



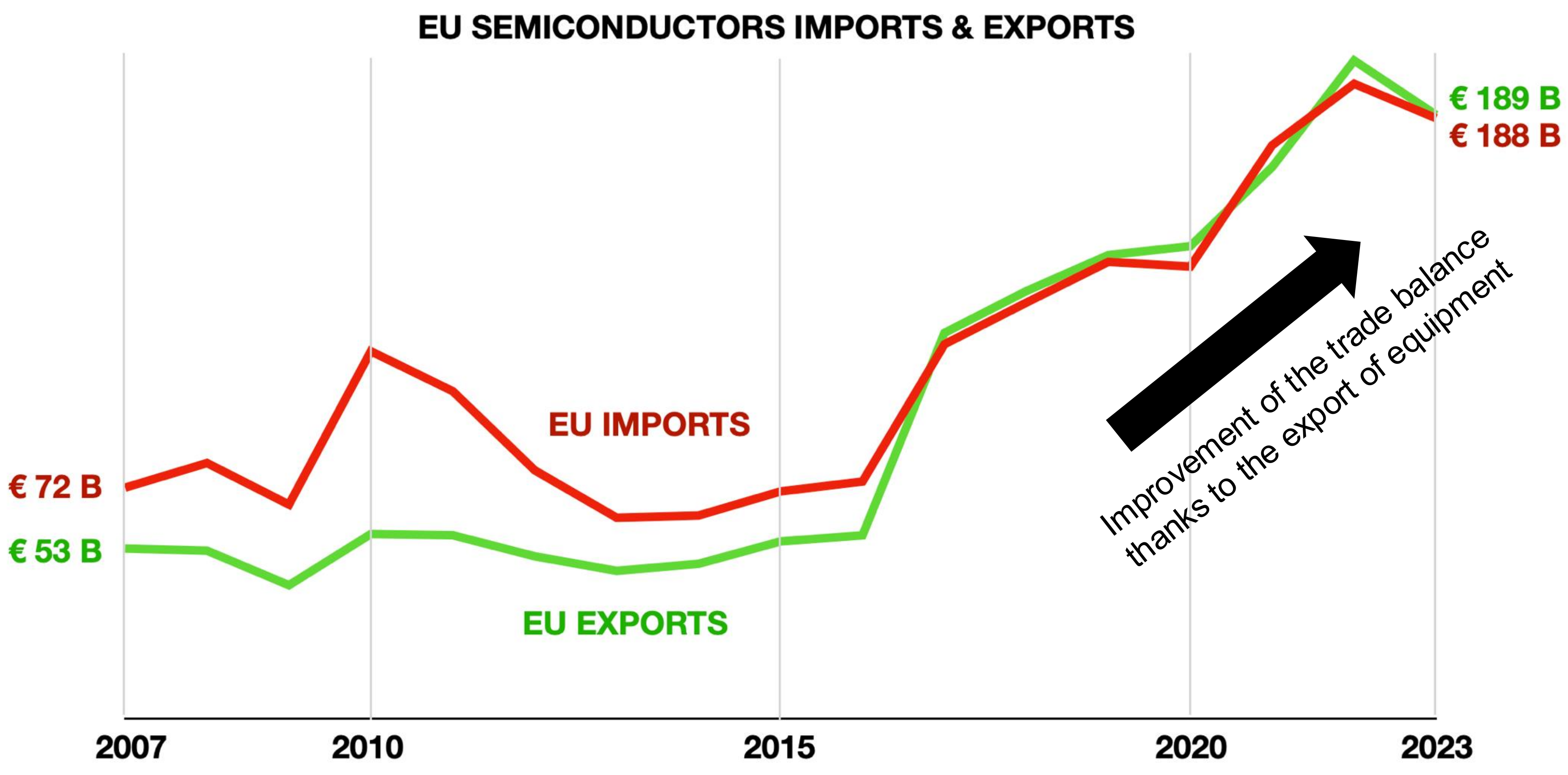
Source: DECISION Études & Conseil; UN Comtrade; WTO Stats

Semiconductor Trade Dynamics
Between US-China-EU Blocks (2015-2023) (2018=100)

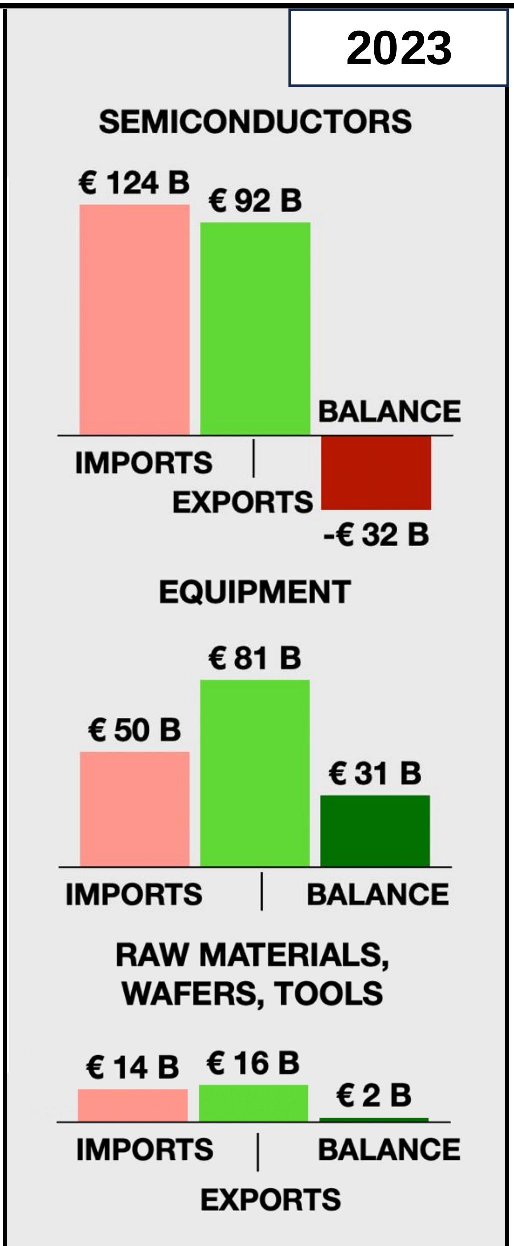


Source: DECISION Études & Conseil; UN Comtrade

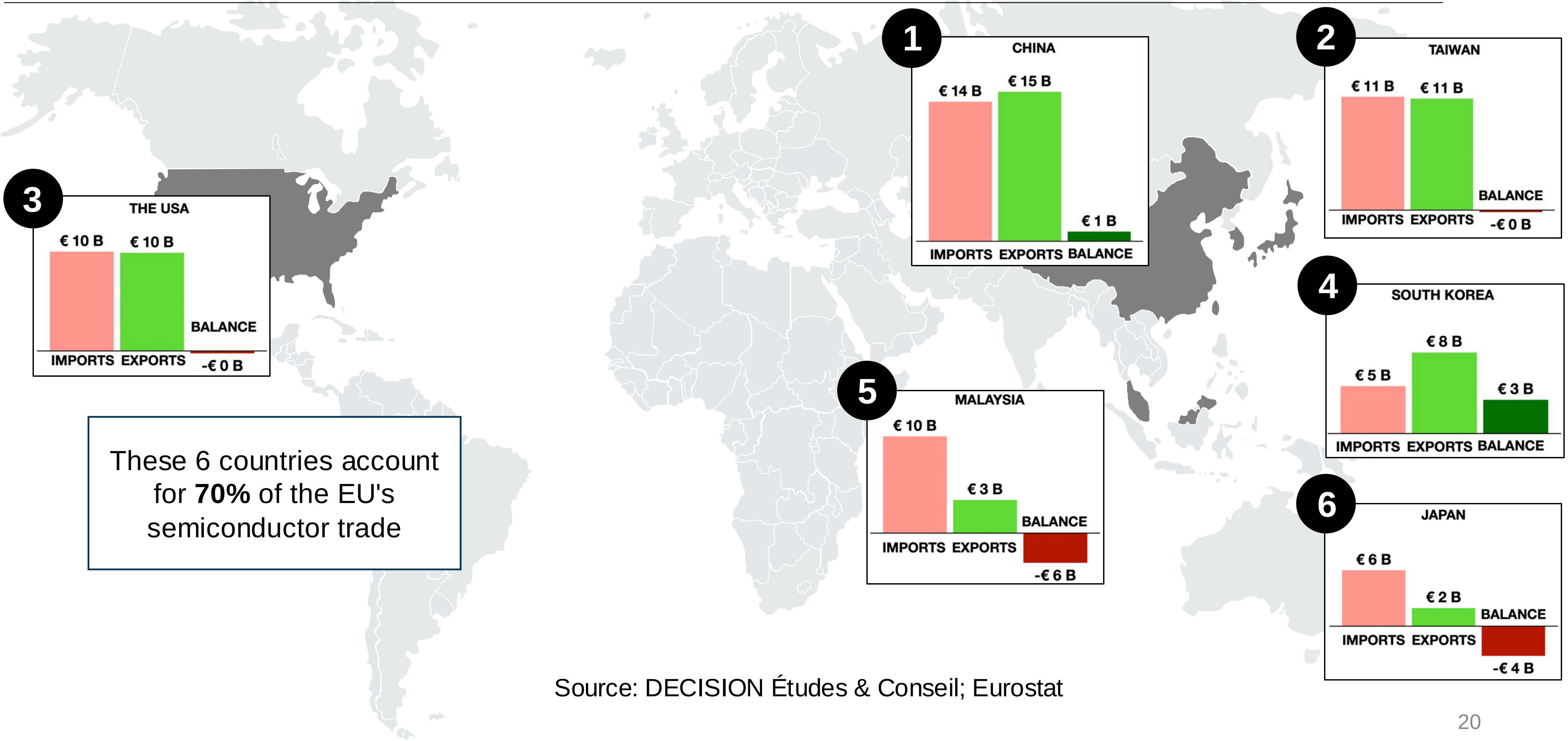
EU trade balance
Semiconductors, equipment, other



Source: DECISION Études & Conseil; Eurostat



Main trading partners of the EU in semiconductors



These 6 countries account for **70%** of the EU's semiconductor trade

Source: DECISION Études & Conseil; Eurostat

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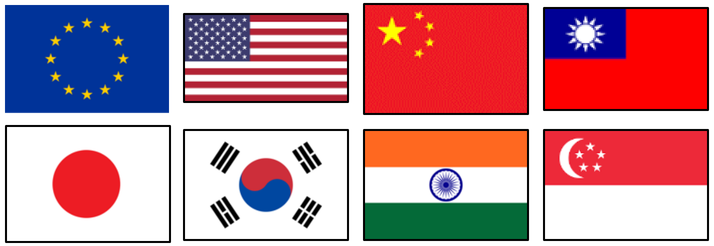
The EU Semiconductor Strategy

Adapting to a Changing Geopolitical Landscape

Report published in July 2024

Status of the semiconductor industries of 8 countries



& roadmap for cooperation in the confidential version shared to the Commission in February 2024

EU leaders in the semiconductor value chain

ICOS International Cooperation On Semiconductors

Material

- Epitaxial Wafers — soitec
- Raw silicon wafers — siltronic perfect silicon solutions
- Photomask — ∅
- Raw materials — Merck, BASF We create chemistry, Air Liquide, umicore, Atlas Copco, Linde

Semiconductor

IDM

ST life.augmented, Infineon, NXP, ams, BOSCH, nexperia

Design & Conception

- IP — ∅
- EDA — SIEMENS
- Fabless — ∅ Melexis INSPIRED ENGINEERING

Front-end

- Pure-Play Foundries — ∅ xfab

Back-end

- OSAT — ∅
- IC Substrate — ∅ AT&S

Equipment

Back-end — ∅ Besi

Others — exyte, TRUMPF, ZEISS

Front-end

- Lithography — ASML
- Etching and cleaning — ∅
- Diffusion, implantation & Deposition — ∅ ASM, AIXTRON
- Methrology & quality control — ∅
- Other Front-end — ∅

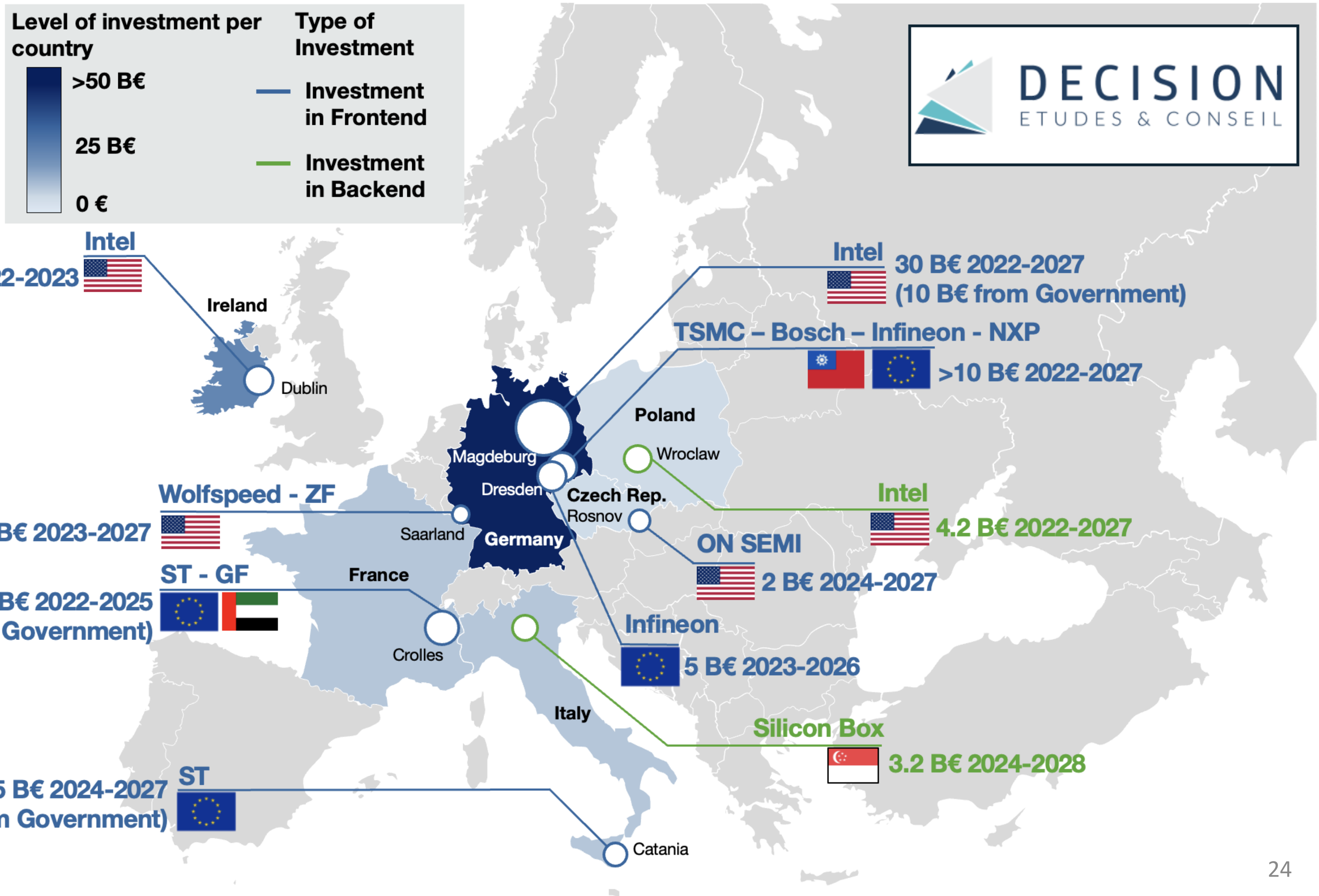
Source: DECISION Etudes & Conseil, 2023

Research & Technology Organizations

imec, Fraunhofer, cea leti

EU Chips Act
Key investments in the EU (>1B€)

- In total, €106B public and private investment
- 58% of investments from US companies
- €37B delayed



Future scenarios

1. Progressive de-risking, regionalization of value chains
2. Renewed US-China Economic Understanding (including a deal on Taiwan?)
3. Escalation (likely around Taiwan) -> Value chain disruption, decoupling

In any scenario, how to ensure a resilient EU semiconductor ecosystem?

- Considering our key export markets: Asia, China, Taiwan, North America
- Addressing our weaknesses & strategic dependencies

Challenges & opportunities for the EU
(non-exhaustive)

Challenges

- Talent gap: 75 400 workers lacking by 2030
- Find equilibrium between Asia and America
- …

Opportunities

- Develop new industrial policy tools to adjust industrial policies from third countries
- Strengthen the EU ecosystem of design of advanced processors
- …

Thank you for your attention

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