



European Chips Act

Information Session for Stakeholders

DG CNECT, Tuesday 29 March 2022

Agenda

1 Context: A semiconductor crisis

Dr Colette MALONEY, Head of Unit CNECT A3,
Microelectronics and Photonics Industry

2 Pillar 1: Chips for Europe Initiative

Q&A

3 Pillar 2: Security of Supply

Mr Kilian GROSS, Head of Unit CNECT A2, Artificial
Intelligence Policy Development and Coordination

Q&A

4 Pillar 3: Monitoring and Crisis Response

Ms Laura JUGEL, Legal Officer, CNECT A2, Artificial
Intelligence Policy Development and Coordination

Q&A

5 Concluding remarks

Mr Kilian GROSS, Head of Unit CNECT A2, Artificial
Intelligence Policy Development and Coordination

Context: A semiconductor Crisis

The context: we are in a crisis...

1

Severe shortage of semiconductor chips

In a context of...

- Accelerated digital transition
- **Increased demand** for semiconductors
- **Concentration of production** in Asia (Taiwan, Korea)

2

Security supply risk in the EU

Due to...

- Limited **capabilities** in manufacturing
- Insufficient **expertise** in manuf. at < 20 nm
- High entry fees / **cost** for new facilities
- **Geopolitical** tensions (e.g., South China Sea)

3

Detrimental effect across industries

Leading-edge semiconductor technology is central to...

- **Competiveness**
- **Security, safety and data protection**
- **Energetic performance** of digital systems



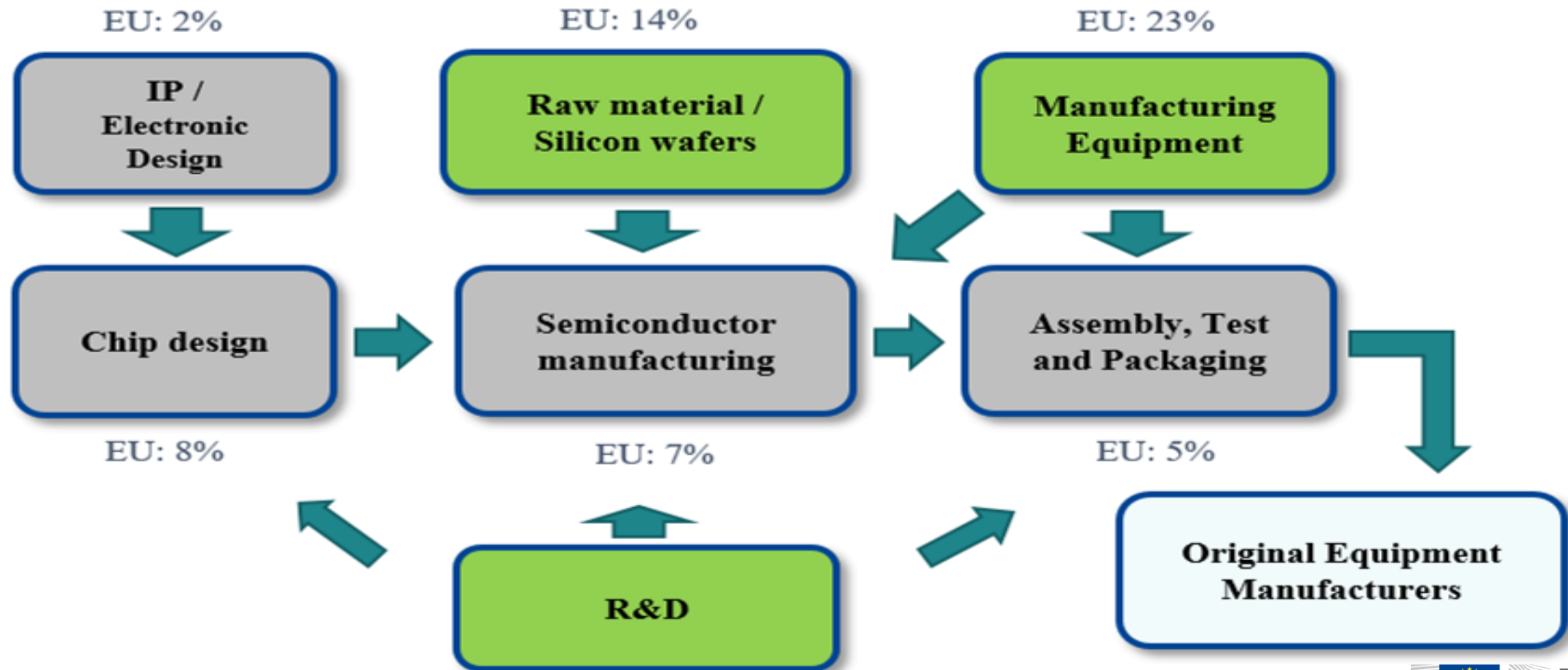
No single Member State can face these problems alone, need for:

- **EU & international partnerships**
- **Public subsidies**



Minus 11 million cars produced globally and 23% drop in German car sales in 2021.

Semiconductors value chain in Europe

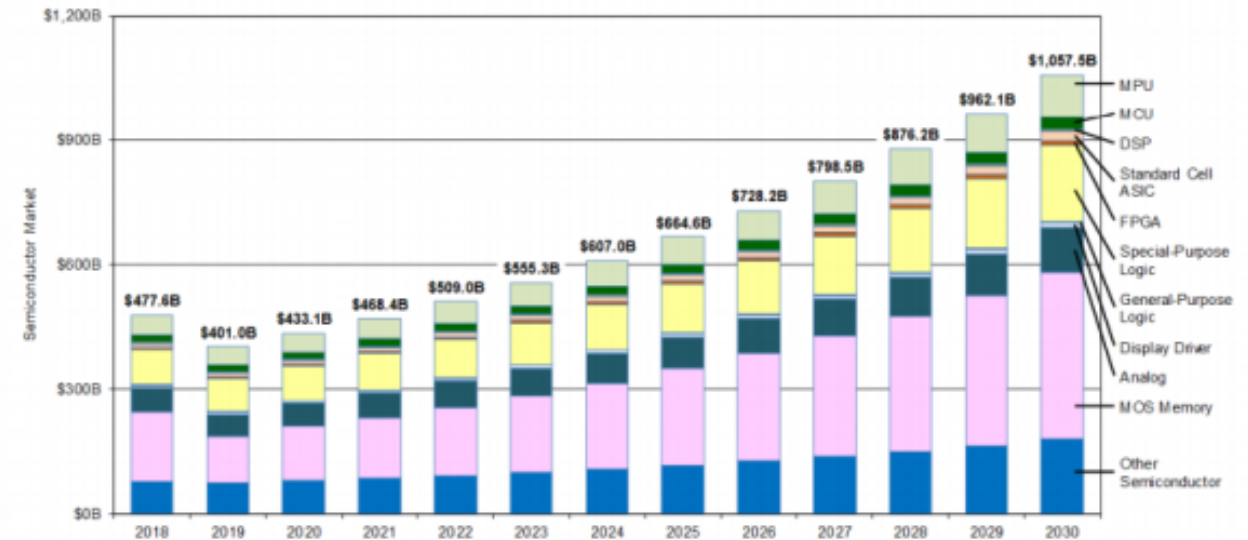


Market forecast

| Market | 2019 market size (\$bn) | 2024 market opportunity (\$bn) | CAGR (%) |
|-----------------------------------|-------------------------|--------------------------------|-------------|
| Smartphone | 106 | 155 | 7.9% |
| Personal computing | 86 | 99 | 2.8% |
| Consumer electronics | 42 | 61 | 7.7% |
| Automotive | 41 | 65 | 9.5% |
| Industrial electronics | 49 | 71 | 7.8% |
| Wired and wireless infrastructure | 34 | 45 | 5.5% |
| Servers, datacenters and storage | 61 | 102 | 10.6% |
| | 419 | 598 | 7.3% |

ASML Annual Report, Feb 2021

Semiconductor Market by Product



SEMICONDUCTOR MARKET WILL BE \$1 TRILLION IN 2030

IBS, SEMI, 2021

The market is forecast to exceed **USD 1 Trillion by 2030**

→ Europe must develop capabilities in **digital design and advanced node production** to capture opportunities in edge computing, automotive, industrial electronics, etc.

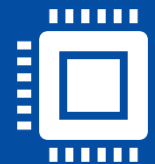
Digital Decade target: doubling of market share by 2030



Doubling of demand by 2030



**Emerging market opportunities:
AI, edge computing, digital
transformation**



**Technological change:
miniaturisation reaches its limits**

Europe needs a Chips Act!

“*Our aim is to jointly create a state-of-the-art European chip ecosystem, including production. We need to link together our world-class research, design and testing capacities. We need to coordinate EU and national investment along the value chain. This is not just a matter of our competitiveness. This is also a matter of tech sovereignty.*

Commission President Ursula von der Leyen set the vision for Europe's chip strategy for the digital decade in her state of the Union speech of 15 September 2021:

Europe's objectives are:

- **To strengthen its research and technology leadership**
- **To build and reinforce its own capacity to innovate in the design, manufacturing and packaging of advanced chips**
- **To put in place an adequate framework to increase substantially its production capacity by 2030**
- **To address the acute skills shortage**
- **To develop an in-depth understanding of the global semiconductor supply chains**

Three pillars of the Chips Act

European Semiconductor Board (Governance)

Pillar 1

Chips for Europe Initiative

- Initiative on infrastructure building in synergy with the EU's research programmes
- Support to start-ups and SMEs

Pillar 2

Security of Supply

- First-of-a-kind semiconductor production facilities

Pillar 3

Monitoring and Crisis Response

- Monitoring and alerting
- Crisis coordination mechanism with MS
- Strong Commission powers in times of crisis

The Chips Act Package

| | Pillar 1 Chips for Europe Initiative | Pillar 2 Security of Supply | Pillar 3 Preparedness and Monitoring |
|----------|---|--|---|
| 1 | Commission Communication | | |
| 2 | | | Commission Recommendation |
| 3 | Chips Act Regulation | | |
| 4 | SBA amending act | | |

Pillar 1: Chips for Europe Initiative

Chips for Europe Initiative: Why do we need an Initiative?

Situation today

- Strong in R&D, RTOs and in manufacturing equipment
- EU and Member States spend ~4 B€ in research and in part of the supply chain development in MFF programmes

What is the EU missing today

- Industrial capabilities in advanced production notably in leading edge nodes
- Design capabilities for leading-edge nodes
- Capability for translating R&D know-how into industrial innovation
- Market pull



EU + MS programmes address the above to a very limited extent

Basic
Research

Applied
Research

Prototyping

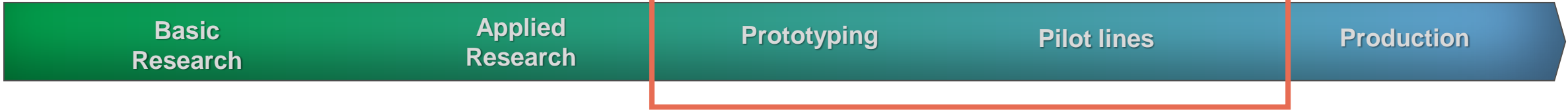
Pilot lines

Production

Chips for Europe Initiative: What are the objectives?

Bridge the gap from lab to fab
Create large innovation capacity and a resilient and dynamic semiconductor ecosystem

- Build up **large-scale design innovative capacities** for integrated semiconductor technologies
- Enhance existing and developing new **pilot lines**
- Build advanced technology and engineering capacities for accelerating the development of **quantum chips**
- Create a network of **competence centres** across Europe
- Establish a **Chips Fund** to facilitate access to loans and equity by start-ups, scale-ups and SMEs and other companies in the semiconductor value chains



DIGITAL skills actions 2021-2022

EUR 166 Million

1st Call

- 1. Specialised Education Programmes in key capacity areas (Master's courses)
- 2. Coordination and Support Action (CSA) on skills analysis
- 3. Preparatory Action for a Data Space on skills



2nd Call

- Short-term training courses, including Crash Courses for SMEs
- CSA on transformation of digital education

NOW OPEN

3rd Call

- Specialised Education Programmes in key capacity areas

Opening September 2022

Industrial Alliance for Processors and Semiconductor Technologies

Slide 15

Launch

- **Launched** July 19th 2021: publication of Terms of Reference (ToR),
- Applications always open, no deadline
- Open to any entity with relevant activities - Application Form & Declaration

Objective

- Strengthening the EU's industrial capacities
- Maintain and boost competitiveness of the EU's microelectronics sector
- Advisory role on the initiatives foreseen under the Chips Act

Tasks

- A. Planning and Analysis**
 - ✓ Identify gaps, bottlenecks, dependencies
 - ✓ Develop strategic roadmaps
- B. Increase design capacity and manufacturing production in EU**
 - ✓ Define a roadmap to reach advanced nodesTwo parallel targets: 16-10nm and 5nm to 2nm
- C. Foster investment and synergies across private/public initiatives**

Platform to enhance coherence across activities in the IPCEI, the KDT JU, DEP and the Pact for Skills



Q&A

Thank you for your attention!

Pillar 2: Security of Supply

Rationale and objectives

- Pillar 2 sets framework to facilitate the implementation of projects that **contribute to the security of supply and strengthen the resilience of the semiconductor ecosystem** in the Union

Recognition of two types of first-of-a-kind facilities:
Integrated Production Facility and Open EU Foundry

Facilities have to comply with certain criteria to make sure they are a reliable supplier of chips in a situation of crisis

Definition of first-of-a-kind facility

First-of-a-kind facilities (1): Definition

First-of-a-kind facility

- ▶ Facility needs to offer innovation that is not yet present **in the Union**
- ▶ Could be with regard to **different aspects**, e.g. small scale of nodes, new functionalities or environmental footprint
- ▶ Only innovation which is **not yet substantively** present: not excluded by existing innovation in R&D or small-scale production sites

“*an industrial facility capable of semiconductor manufacturing, including front-end or back-end, or both, that is not substantively already present or committed to be built within the Union, for instance with regard to the technology node, substrate material, such as silicon carbide and gallium nitride, and other product innovation that can offer better performance, process innovation or energy and environmental performance*”

First-of-a-kind facilities (2)

Integrated Production Facility (IPF)

Vertically integrated first-of-a-kind facility which produce the chips they design and market

Open EU Foundry (OEF)

First-of-a-kind facility that (also) **produces chips which are designed and marketed by unrelated undertakings**

Common Criteria:



Qualification as first-of-a-kind facility



Clear positive impact on the value chain (security of supply and qualified workforce)



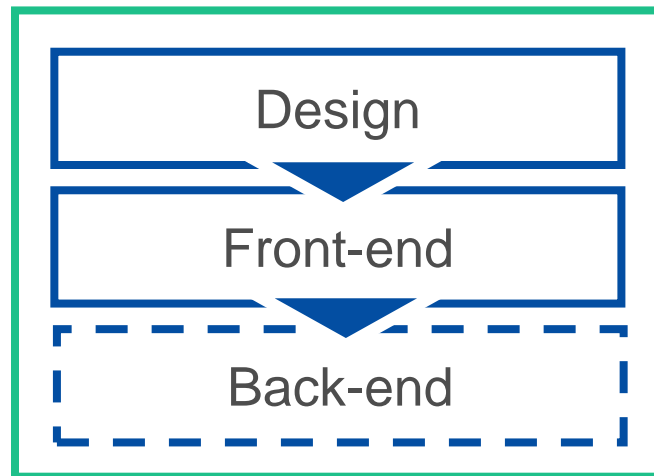
Security of supply: guarantees not to be subject to extraterritorial application of public service obligations of third countries in a way that undermines the ability to accept priority rated orders



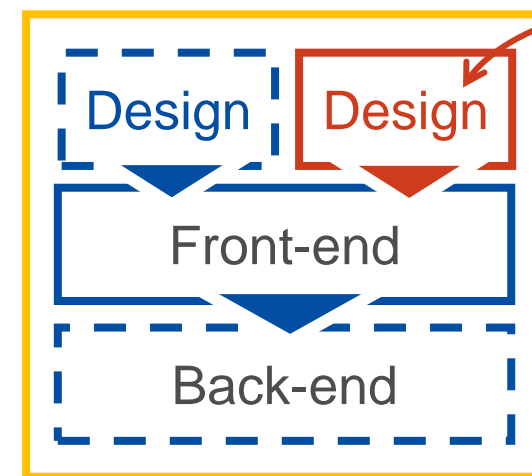
Clear commitment to invest in the next generation of chips

First-of-a-kind facilities (3)

Integrated Production Facility



Open EU Foundry



Other companies

Users of semiconductors

Front-end: manufacturing/producing of chips

Back-end: advanced packaging of chips

Recognition of IPF and OEF

- **Application** by individual company or consortium of companies
- Assessment of the Commission **in consultation with the European Semiconductor Board**
- Approval by **Commission decision**

Elements of the assessment:

- **Compliance with criteria** for IPF or OEF
- **Viability** of the project:
 - Business plan evaluating financial viability
 - Proven experience of applicant
 - Letter of intent by supporting Member State(s)



Monitoring

- Commission monitors activities by IPF and OEF
- In the case that
 - ▶ **IPF or OEF no longer fulfils criteria:**
 - Notification to European Semiconductor Board
 - Hearing of the facility
 - Commission repeals decision to grant label
 - ▶ **Application contained incorrect information:**
 - Consultation with European Semiconductor Board
 - Commission repeals decision to grant label

Benefits of the label



Fast-tracking of permit granting procedures

- Priority status under national law for administrative applications
- Single point of contact in national authorities for all administrative applications



Priority access to pilot lines set up under the Initiative

- To facilitate innovation in next generation chips as a counterpart for the commitment to continued investment in innovation

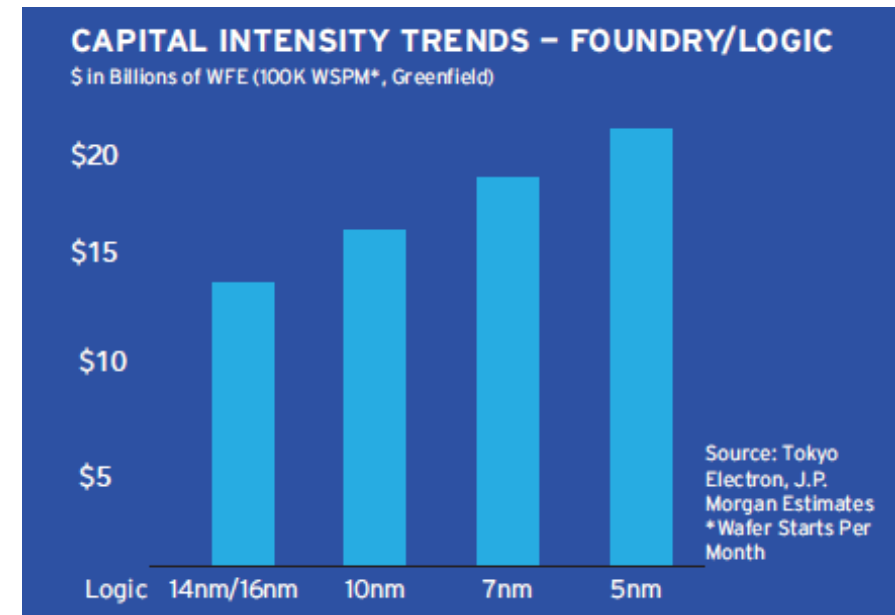


Label determines that a facility is first-of-a-kind in the Union

- In the overall balancing of the positive effects of the aid against its negative effects on competition and trade, the Commission will take into account the fact that new production facilities are first-of-a-kind in the Union

State aid for first-of-a-kind facilities (1)

- Chips sector is characterized by **capital intensity and high barriers to entry**, especially for leading-edge technologies
- This is due to **high capital expenditures**: it is estimated that a modern fab (technology node size of 5 nanometres) costs USD 20 billion in capital expenditure
- Capital intensity set to further **increase** with advances in technology
- Investment in innovation is risky, while at the same time returns materialize only after very long periods
- **High public subsidies** allocated in regions outside the EU



State aid for first-of-a-kind facilities (2)

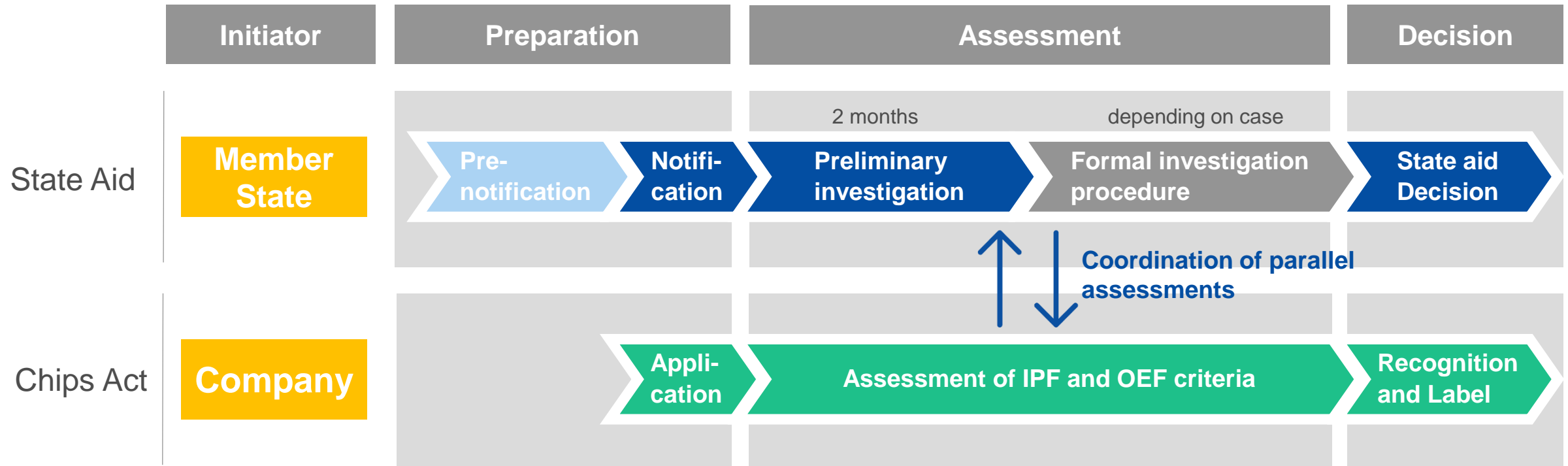
- ▶ Commission may authorise State aid of **up to 100% of a proven funding gap** for the establishment of **first-of-a-kind facilities** in the Union based on State aid rules

- Individual State aid authorisation based directly on Art. 107(3)(c) of the Treaty
- Definition of first-of-a-kind facility in the Union in Chips Act
- Recognition as IPF or OEF and State aid assessment to be conducted in parallel
- Aid intensity limited to sufficiently proven funding gap

Elements of State aid assessment:

- ✓ Aid does **not adversely effect trade conditions**: first-of-a-kind status positive factor in balancing of effects
- ✓ Aid has an **incentive effect**: project would not take place otherwise
- ✓ Aid is **necessary, appropriate and proportionate**: only what is needed

Timeline of procedures



For projects notified **before Chips Act adoption**, COM will take into account compliance with criteria from the proposal with expectation that projects will apply for the label after the adoption.

Link to IPCEI

- ▶ First-of-a-kind facilities and IPCEIs will be **complementary**:
 - IPCEI State aid framework intended to support R&I projects up to **first industrial deployment** in areas of common interest based on Art. 107(3)(b).
 - State aid assessments of first-of-a-kind facilities to **set-up production capacity** will be based on Art. 107(3)(c).

IPCEI on Microelectronics

- ▶ First IPCEI 2014-2018
- ▶ 32 participants from 5 MS
- ▶ EUR 8.4 billion investment
- ▶ EUR 1.9 billion funding



IPCEI on Microelectronics and Connectivity

- ▶ Second IPCEI, pre-notification in December 2021
- ▶ Expected involvement of 20 MS (DE as coordinator)
- ▶ Expected participation >100 companies, universities & RTOs

Q&A

Thank you for your attention!

Pillar 3: Monitoring and Crisis Response

Rationale and objectives

- Pillar 3 sets up a **mechanism for monitoring and crisis response**

Objectives:

▶ **Anticipating and mitigating shortages** of the semiconductor supply chain

▶ Strengthening the Union's and Member States' **abilities to react to crises** related to disruptions of the semiconductor supply chain

**European
Semiconductor
Board**

as a mechanism for
coordination

Coordination through Board

Recommendation

- **Recommendation** invites Member States to coordinate in a **European Semiconductor Expert Group**
- Coordination of **response to the current shortage** and preparatory work to set up a **coordinated monitoring mechanism**



Regulation

- **European Semiconductor Board becomes the central platform for coordination and exchange** under the legislative act



Monitoring and crisis mechanism

Monitoring stage

- Regular monitoring by Member States and update mechanism for alerts by stakeholders
- Board meetings with advisory participation of industry stakeholders and other relevant Union bodies



Crisis trigger

When **assessment of Commission provides evidence** of serious disruptions in the supply

- entailing significant negative effects on one or more important sectors, or
- preventing the repair and maintenance of essential products used by critical sectors

Commission implementing act

(preference for normal procedure, possibility for urgency procedure in exceptional cases)

Crisis stage

- Emergency Toolbox activated
- Intensified coordination in the Board



Emergency toolbox

- **Toolbox of emergency measures** which the Commission would be empowered to use to **ensure security of supply to critical sectors** in the crisis stage:



1. Information gathering



2. Priority rated orders



3. Common purchasing



4. Export control

Information requests

- ▶ **Objective:** to gain in-depth understanding of crisis and to identify potential mitigation or crisis measures.
- Commission may launch **mandatory information requests** about production capabilities and capacities, current primary disruptions and other existing data necessary to assess the nature of the crisis or to identify and assess potential mitigation or emergency measures

Scope

▶ **Representative organisations**

▶ If necessary, **individual companies** along semiconductor supply chain

Priority rated orders (1)

► **Objective:** Ensuring security of supply to critical sectors in a situation of crisis.

Functioning

- Obligation to **accept and prioritise** an order of crisis-relevant products
- Only where **necessary and proportionate**, having regard for the legitimate aims of the undertaking and the cost and effort required for any change in production sequence
- **Commission decision** specifies time limit, product and quantity
- Placed at fair and reasonable prices

Safeguards

Right to redress

- undertaking is **unable to perform the order**, even under preferential treatment, or
- **unreasonable economic burden** and particular hardship

Liability protection

- undertaking is **not liable** for any breach of contractual obligations required to comply with the priority rated orders, e.g. delays, failure to perform
- Encouragement to anticipate possibility in contracts

Priority rated orders (2): Scope

Article 21(1) and (2)

Facilities which are recognized as **Integrated Production Facilities** or **Open EU Foundries** following the Chips Act

Semiconductor undertakings which accept such possibility in the context of receiving public support

When:

- ▶ necessary and proportionate to ensure the operation of all or certain critical sectors

▶ **Obligation to accept priority rated orders**

Article 21(3)

Any semiconductor undertakings operating along the semiconductor supply chain in the Union that

if subject to a third country priority rated order

▶ **Obligation to notify the Commission**

When:

- ▶ compliance with this obligation significantly impacts the operation of certain critical sectors

▶ **Obligation to accept priority rated orders**

Common Purchasing

- ▶ **Rationale:** Pooling the negotiating leverage and offering access to a larger procurement market for joint procurement of e.g. critical raw materials, wafers for the benefit of critical sectors.

Functioning

- Commission acts as central purchasing body **on behalf of Member States**
- Initiative by two or more Member States
- Commission and Member States stipulate **framework agreement**
- Procurement rules of **Financial Regulation** apply
- Deployment and use of products remains **Member States' responsibility**
- **Financing provided by Member States**, possibility to include financing from the Union

Similar tools already in use:

- **Joint Procurement Agreement (JPA)** enabling COM to organise procurement of medical supplies on behalf of participating MS. 12 procedures since 2020, allowing countries to order essential medical supplies for nearly €13 billion. The JPA is based on Art. 168(2) TFEU (support to MS cooperation in public health).
- COM **centralized approach on procuring COVID-19 vaccines on behalf of MS**, following an agreement between COM and MS based on Council Regulation (EU) 2016/369 (ESI Regulation). COM financed a part of the upfront costs from the €2.7 billion Emergency Support Instrument.

Export Control

- European Semiconductor Board may assess impact of the possible imposition of protective measures and **provide an opinion in order to inform the Commission assessment** under the EU framework of common rules for export
- Any export authorisation scheme would be introduced under the EU framework of common rules for export

Framework of Regulation (EU) 2015/479 on common rules for exports

To prevent or remedy a critical situation caused by the shortage of an essential product:

- **Article 5:** Empowerment for export authorisation scheme of 6 weeks via COM implementing act (examination or urgency procedure)
- **Article 6:** Empowerment for appropriate measures via COM implementing act (examination procedure)

Framework was used for an export authorisation of COVID-19 vaccines from 30 Jan until 31 Dec 2021 (originally based on Art. 5, then extended based on Art. 6). This has helped to improve the transparency of vaccines production, deliveries and supply chains, and to secure deliveries to Europeans in line with companies' contractual obligations.

European Semiconductor Board

Member States



European Semiconductor Board:

- Composed of high-level representatives of Member States
- Commission acts as chair and secretariat
- European Industrial Semiconductor Alliance, other stakeholder organisations or experts may be invited to participate in advisory function
- Ad-hoc subgroups
- Cooperation with other Union crisis response structures in a semiconductor crisis
- Support the Commission in international cooperation

Q&A

Thank you for your attention!

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