

# Transition Pathway for the Chemical Industry

Efforts of European and Japanese Chemical  
industries

*27 February 2023; webinar*

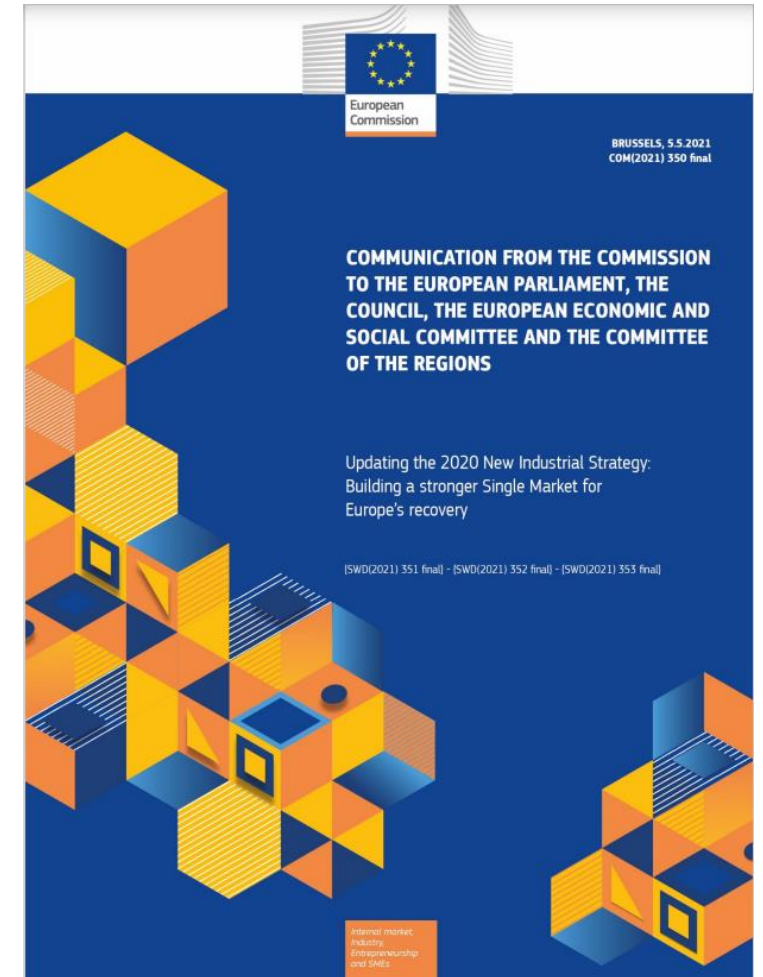
# 1. Background



# The 2021 updated Industrial Strategy

[COM\(2021\) 350 final](#)

- To co-create, in partnership with industry, public authorities, social partners and other stakeholders, **transition pathways** for ecosystems, where needed.
- Pathways offer a better bottom-up understanding of the **scale, cost, long-term benefits and conditions** of the required action to accompany the **twin transition** for the most relevant ecosystems, leading to an actionable plan in favour of sustainable competitiveness.
- **Priority to** tourism and energy-intensive industries (incl. **chemicals** and steel).



# The changing landscape for the EU chemical industry (1)



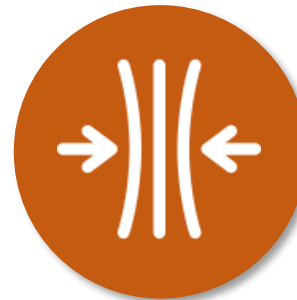
## Global market share

- *Decreasing pattern (2030 forecast)*



## Energy prices

- *Increasing, unstable*



## Geopolitics

- *Russian war of aggression against Ukraine;*  
- *China zero-Covid policy;*



## Technology

- *Alternative feedstock*  
- *Digitalisation*

# The changing landscape for the EU chemical industry (2)



## Climate

*Green Deal, European Climate Law, Landfill Directive, Packaging and Packaging Waste Directive, Waste Framework Directive, Sustainable Carbon Cycle, Sustainable Product Initiative, ETS*



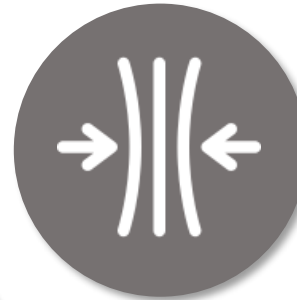
## Energy

*REPowerEU  
Renewable Energy Directive  
Industrial Emission Directive*



## Chemicals Strategy for Sustainability

*Restriction Roadmap  
Safe and Sustainable by Design  
Toxic-free environment*



## Resilience

*Update of the Industrial Strategy  
Due Diligence in the Supply Chain  
Advanced Materials manifesto and the critical raw material strategy*



## Digitalization

*Digitalisation of Chemical Production  
Data sharing  
Product Passport*

## 2. The outcome



# The transition pathway for the Chemical Industry

- Publication: 27 January 2023
- Actionable plan co-developed by the European Commission with EU Member States, industry, NGOs and other stakeholders
- Based on 8 building blocks developed by Industrial Forum



Sustainable  
competitiveness



Investment  
and funding



Research  
and Innovation



Regulation and  
Public Governance



Access to energy  
and feedstock



Infrastructure



Skills



Social dimension

- It identifies ~190 actions needed for the twin transition and increased resilience

# List of topics

Building Blocks	Topics
<b>1. Sustainable Competitiveness</b>	Topic 1: International competitiveness
	Topic 2: Reduction of unsustainable dependencies and supply chains vulnerabilities
	Topic 3: Safety and Sustainability
	Topic 4: Innovation and growth of SMEs
	Topic 5: New synergies
<b>2. Investments and Funding</b>	Topic 6: Fund for Green Investments
	Topic 7: Access to Funding
<b>3. R&amp;I, Techniques and Technological Solutions</b>	Topic 8: Better conceptualisation of new techniques and technical solutions (TRL 1 to 5)
	Topic 9: Developing new techniques and technological solutions (TRL 6 to 7)
	Topic 10: Deployment of new techniques and technological solutions (TRL 8 to 9)
<b>4. Regulation and Public Governance (Legislation)</b>	Topic 11: More effective and predictable regulation
	Topic 12: Vertically and horizontally coherent legislation
	Topic 13: Effective and efficient enforcement
<b>5. Access to energy and feedstock</b>	Topic 14: Anticipate long-term needs for Energy and Resource Supply
	Topic 15: Economically viable purchase of clean energy
	Topic 16: Feedstock Substitution
	Topic 17: Process and resource efficiency
<b>6. Infrastructure</b>	Topic 18: Large-scale electricity and hydrogen infrastructure
	Topic 19: Development of new sustainable production facilities
	Topic 20: Sustainable transport of raw materials and chemical products
	Topic 21: Deployment of digital technologies
	Topic 22: Circularity: recycling and reuse infrastructure
<b>7. Skills</b>	Topic 23: Education (reskilling/upskilling the workforce)
	Topic 24: Sufficient supply of jobs at technical level
<b>8. Social Dimension</b>	Topic 25: Impact on workforce and consumers
	Topic 26: Improve gender diversity and equality in the sector



# Example: sustainable competitiveness

- **Relevance for EU economy:**
  - ✓ EU chemical industry 4<sup>th</sup> largest industry in Europe (€499 bln sales in 2020);
  - ✓ However, its global market share is declining and forecasted to decline;
  - ✓ Therefore, need to ensure industry's continued competitiveness becoming more sustainable.
- **What should the industry do? (some examples):**

## Topic 1: International competitiveness

- Drive international competitiveness
  - Analyse medium to long-term impacts of energy crisis on sustainable competitiveness
  - KPIs and Sustainable Development indicators
- Promote the market for sustainable products
  - SSbD framework
  - 'market pull' and incentives: sustainable products with higher costs

## Topic 5: New synergies

- Facilitate the exchange of information
  - [Euroclusters initiative](#)
- Increase collaboration to de-risk investments
  - cross-border projects on the generation and supply of energy and feedstock
- Partnerships for innovation
  - Ensure shared access to the research and technology infrastructures as part of the European Research Area
  - joint cross-sectoral projects that qualify IPCEIs

## Topic 2: Reduction of unsustainable dependencies and supply-chain vulnerabilities

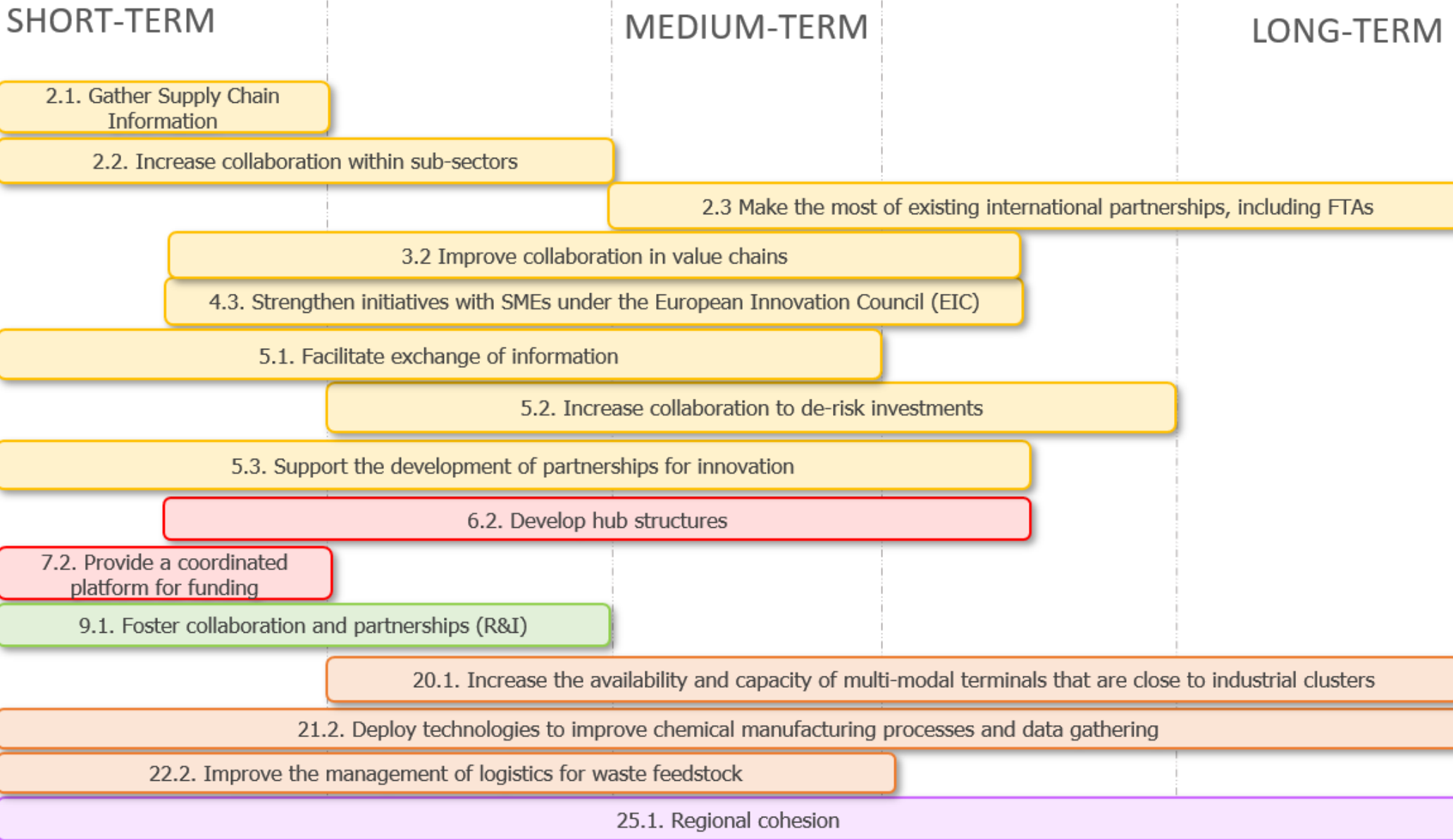
- Gather supply-chain information
  - Undertake a strategic foresight exercise focusing on the EU open strategic autonomy (link with critical raw materials)
  - Assess the need to build up and maintain strategic stocks of critical raw materials within the EU

# The outcome: a roadmap for the transition

- 1. An action-oriented component** grouping the topics under three cross-cutting themes: collaboration for innovation; clean energy supply; and feedstock diversification.
- 2. A technology component** identifying electrification, hydrogen, biomass, waste, Carbon Capture and Utilization (CCU) & Carbon Capture and Storage (CCS), as well as process efficiency as key technological contributors to the transition pathway.
- 3. A regulatory component** that collects the existing legislation, including major research and innovation (R&I) initiatives, influencing digital and sustainable development of the chemical industry.

# Action-oriented roadmap (1)

SUSTAINABLE COMPETITIVENESS	ACCESS TO ENERGY AND FEEDSTOCK
INVESTMENTS AND FUNDINGS	INFRASTRUCTURE
(SUPPORT TO) R&I, TECHNIQUES AND TECHNOLOGICAL SOLUTIONS	SKILLS
REGULATION AND PUBLIC GOVERNANCE (LEGISLATION)	SOCIAL DIMENSION



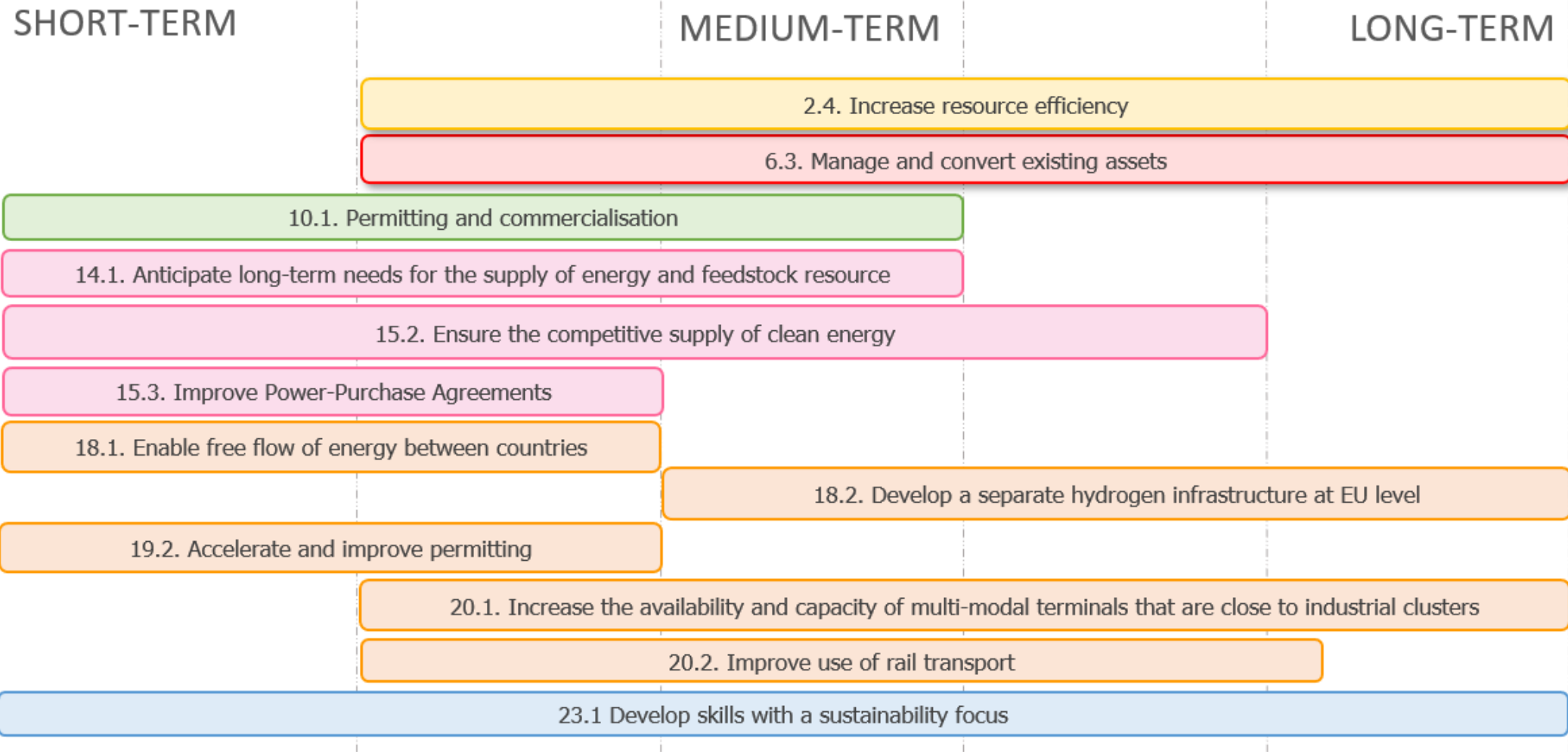
COLLABORATION FOR INNOVATION

# Action-oriented roadmap (2)

SUSTAINABLE COMPETITIVENESS	ACCESS TO ENERGY AND FEEDSTOCK
INVESTMENTS AND FUNDINGS	INFRASTRUCTURE
(SUPPORT TO) R&I, TECHNIQUES AND TECHNOLOGICAL SOLUTIONS	SKILLS
REGULATION AND PUBLIC GOVERNANCE (LEGISLATION)	SOCIAL DIMENSION



**CLEAN ENERGY SUPPLY**



# Action-oriented roadmap (3)



FEEDSTOCK  
SUBSTITUTION

SHORT-TERM

MEDIUM-TERM

LONG-TERM

1.2 Promote the market for sustainable products

3.3 Support product design and re-design

4.4. Support compliance with legislation and funding for new technologies

6.1. EU Taxonomy to support the CSS

7.1. Strengthen communication channels for European funding

8.1. Promote safety and sustainability assessment approaches

8.3. Develop industrial technology roadmap

9.2. Support for development

10.1. Permitting and commercialisation

11.1. Definitions and concepts

11.2. Methods

16.1. Identify and develop new and sustainable sources of feedstock

16.2; 16.3; 16.4. Biomass, Waste, CO2 as alternative feedstock

19.1. Develop recycling facilities and bio-refineries

22.1. Set a regulatory framework for the transport of waste







22.2. Improve the management of logistics for waste feedstock

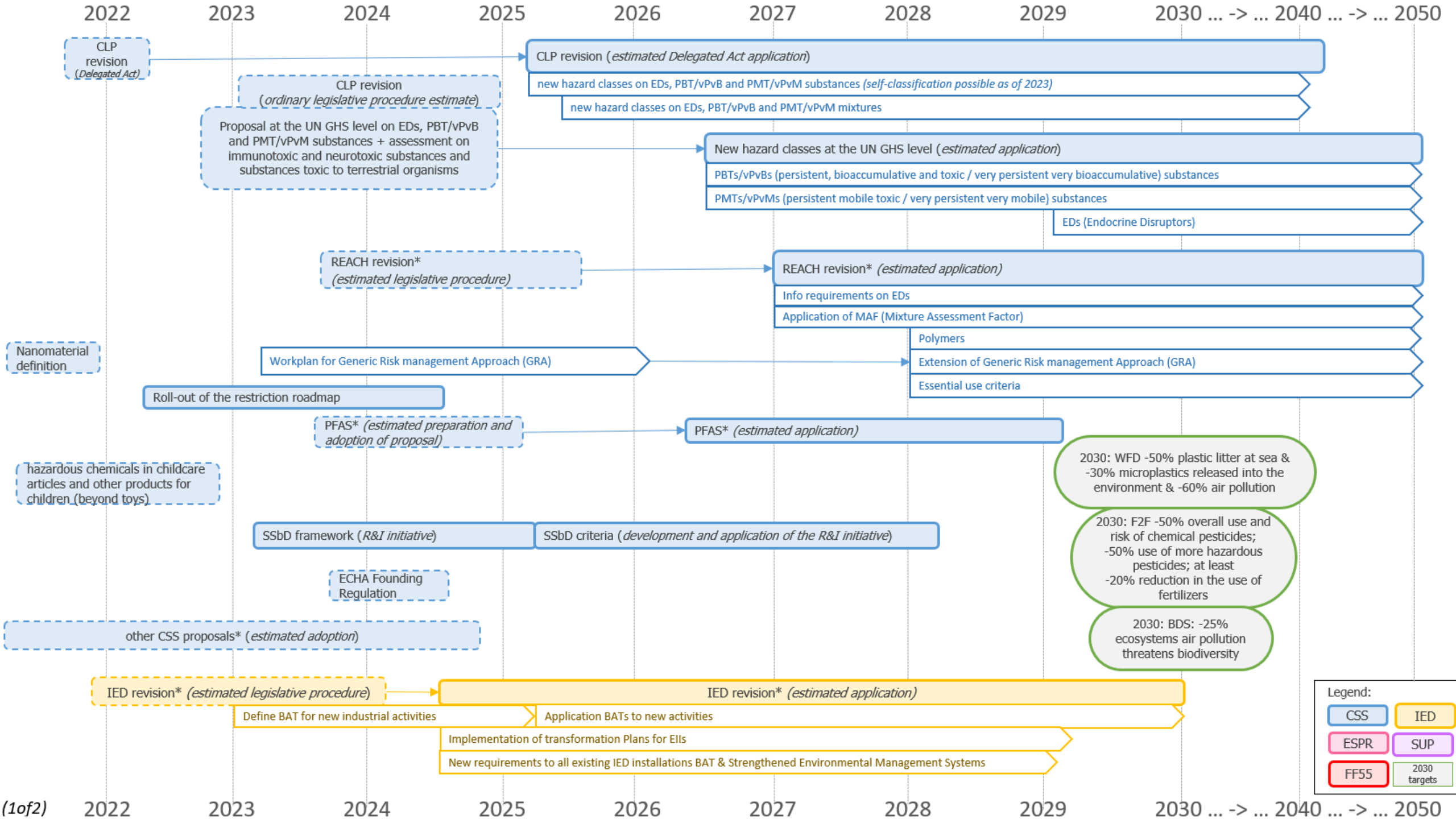
23.2. Adapt secondary, post-secondary and university education

24.2. Increase attractiveness of the sector

25.2. Safety and social security of workers

# Technology roadmap

EU Initiatives supporting Technological Transition (SET Action Plan)	Actions (as presented in Building Blocks – Part II)	EU Initiatives
 <b>A) ELECTRIFICATION</b>	6.2. Develop hub structures 8.3. Development of an industrial technology roadmap 14. Anticipate I-t needs for the supply of energy and feedstock resource 15.1. Channel investments for clean energy 15.2. Ensure competitive supply of clean energy 15.3. Improve Power-Purchase Agreements 18.1 Enable the free flow of energy between countries 20.1. Increase availability and capacity of multi-modal terminals close to industrial clusters 20.2. Improve use of rail transport	<ul style="list-style-type: none"> <li>REPowerEU</li> <li>EU Renewable Directive</li> <li>TEN-E Regulation</li> <li>Proposal for a directive on Energy Efficiency</li> </ul>
 <b>B) HYDROGEN</b>	6.2. Develop hub structures 6.3. Manage and convert existing assets 15.1. Channel investments for clean energy 15.2. Ensure the competitive supply of clean energy 18.2. Develop a separate hydrogen infrastructure at EU level	<ul style="list-style-type: none"> <li>European Clean Hydrogen Alliance</li> <li>Hydrogen and decarbonised gas market package</li> </ul>
 <b>C) BIOMASS</b>	4.3. Strengthen initiatives with SMEs under the EIC 8.1. Promote safety and sustainability assessment approaches 9.1. Foster collaboration and partnerships 16.2. Biomass as an alternative feedstock 19.1. Develop recycling facilities and bio-refineries (and exploit synergies with the chemical industry)	<ul style="list-style-type: none"> <li>Revision of the Renewable Energy Directive</li> <li>INCITE (Industrial Emissions Directive)</li> </ul>
 <b>D) WASTE</b>	3.2 Improve collaboration in value chains 3.3 Support product design and re-design 8.1. Promote safety and sustainability assessment approaches 11.1. Definitions and concepts 11.2. Methods 16.3. Waste as an alternative feedstock 22.1. Set a regulatory framework for the transport of waste 22.2. Improve the management of logistics for waste feedstock	<ul style="list-style-type: none"> <li>Hubs4Circularity</li> <li>Waste Framework Directive</li> <li>Landfill Directive</li> </ul>
 <b>E) CCU &amp; CCS</b>	6.3. Manage and convert existing assets 9.2. Support for development 16.4. CO <sub>2</sub> as an alternative feedstock 22.2. Improve the management of logistics for waste feedstock	<ul style="list-style-type: none"> <li>Hubs4Circularity</li> <li>Sustainable Carbon Cycle</li> </ul>
 <b>F) PROCESS EFFICIENCY</b>	3.2 Improve collaboration in value chains 3.3 Support product design and re-design 5.1. Facilitate exchange of information (new synergies) 5.3. Support the development of Partnerships for Innovation 6.3. Manage and convert existing assets 17. Process efficiency 19.1. Develop recycling facilities and bio-refineries (and exploit synergies with the chemical industry) 20.1. Increase the availability and capacity of multi-modal terminals that are close to industrial clusters 21.2. Deploy technologies to improve chemical manufacturing processes and data gathering 25.2. Safety and social security of workers	<ul style="list-style-type: none"> <li>REPowerEU</li> <li>Industrial Symbiosis</li> <li>Revision of the Industrial Emission Directive</li> </ul>



2022 2023 2024 2025 2026 2027 2028 2029 2030 ... -> ... 2040 ... -> ... 2050

ESPR (estimated legislative process) → ESPR - Eco-design for Sustainable Products Regulation (estimated application)

new eco-design and energy labelling working plans → Labelling and eco-design requirements + green claims (tbc)

Disclosure information on discard unsold consumer goods (large businesses only)

Product specific secondary legislation

Provide information on the environmental sustainability of products

Digital product passports

Fit For 55 package\*:  
 • CBAM  
 • EED  
 • RED  
 • LULUCF

Fit For 55 package estimated application → 2030 CL: -55% GHG emissions (vs. 1990)

CBAM (pilot as of October 2023) → EED – Energy Efficiency Directive & RED – Renewable Energy Directive

LULUCF (new rules)

SCC - Sustainable Carbon Cycle

SCC - Sustainable Carbon Cycles (tbc) → 2030 SCC: 5Mt of CO<sub>2</sub>/year removed from atmosphere and permanently stored

Reporting on CO<sub>2</sub> tons capture

2030 SCC: >20% carbon used in chemical and plastic products from sustainable non-fossil sources (indicative)

CSRD – Corporate Sustainability Reporting Directive (first Delegated Act estimate)

2025 Recycled plastic target: 25% for PET bottles

Taxonomy Regulation – Environmental Delegated Act

TR(art. 18) procedures to ensure alignment with OECD Guidelines for Multinational Enterprises and UN Guiding Principles on Business and Human Rights

SFDR - Sustainable Finance Disclosure Regulation (implementation)

Level 1 SFDR obligation → 2030 recycled plastic target: 30% for all drinking bottles

regulatory technical standards (RTS) for climate

DD – Due Diligence (estimated legislative procedure)

obligations of due diligence and establishment of rules on liability for violations of the due diligence obligation

Legend:

CSS	IED
ESPR	SUP
FF55	2030 targets

2022 2023 2024 2025 2026 2027 2028 2029 2030 ... -> ... 2040 ... -> ... 2050



# 3. Co-implementation



# Key elements of the Transition Pathway co-implementation process



## Calls for pledges

### *Main objectives*

- Encouraging stakeholders to commit to concrete and measurable actions
- Collect data to inform the monitoring and evaluation process



## Interaction with stakeholders

### *Main objectives*

- Establishing the governance of the process
- Setting priorities



## Monitoring and Evaluation

### *Main objectives*

- Develop KPIs to monitor and assess the actions for the twin transition



## Publications: Annual progress report

### *Main objectives*

- Assessing the status quo of the co-implementation
- Providing evidence on the actions taken and possible synergies among stakeholders

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