

# Safe and Sustainable-by-Design



An assessment framework

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# Safe and sustainable-by-design timeline

DOCUMENTS

**October 14, 2020**

Announcement within the CSS on development of SSbD criteria for chemicals and materials

→ targeted at INNOVATION



**July 2022**

JRC published preparatory work on the framework or the definition of criteria and evaluation procedures

→ no consultation process as follow-up

**October 2022**

Strategic Research and Innovation Plan for safe and sustainable Chemicals and Materials

**December 2022**

Adoption of Recommendation on European assessment framework for SSbD chemicals and materials

→ Cefic statement



MEETINGS



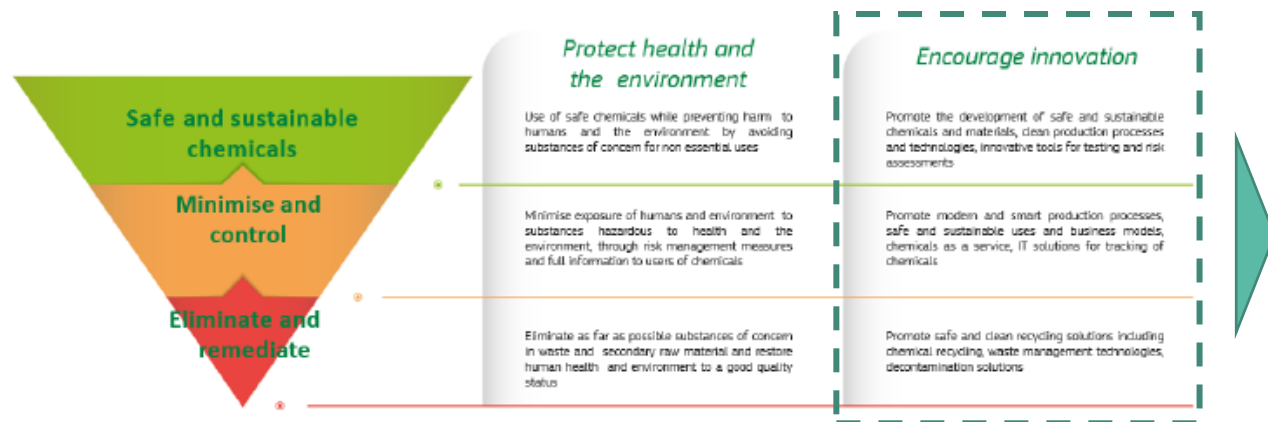
**March 2021/  
March 2022**

First and second stakeholder workshop on SSbD



# Origin of Safe and sustainable-by-design

## Chemicals Strategy for Sustainability – October 2020



### SAFE AND SUSTAINABLE-BY-DESIGN

The Commission will:

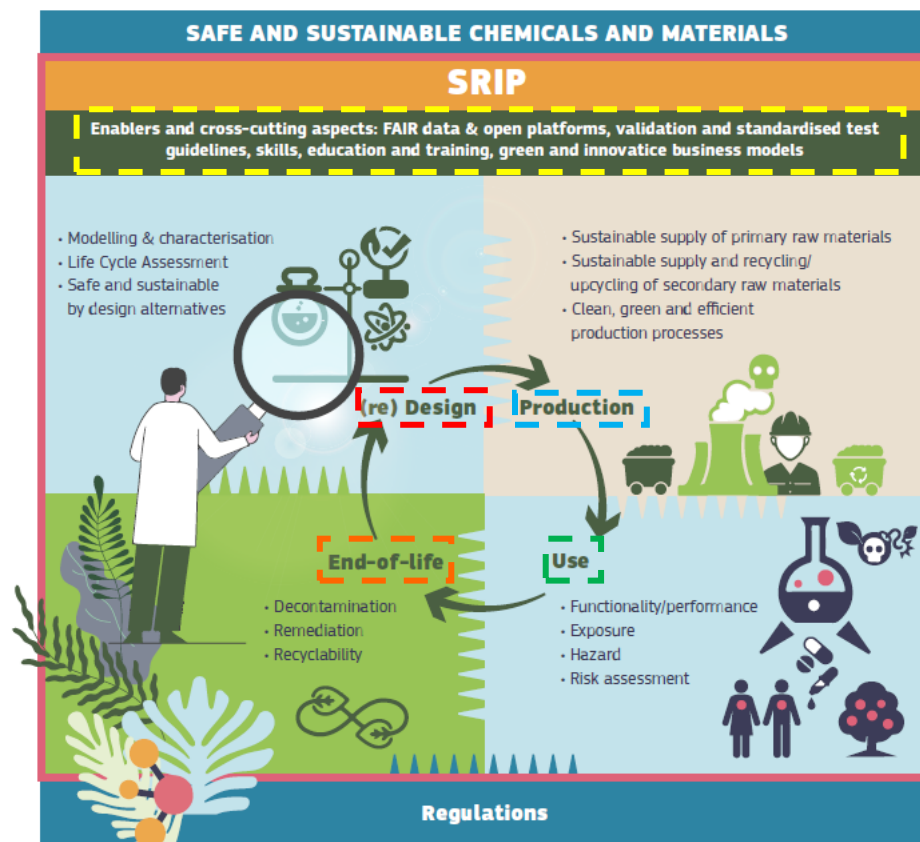
- develop EU **safe and sustainable-by-design criteria for chemicals**;
- establish an **EU-wide safe and sustainable-by-design support network** to promote cooperation and sharing of information across sectors and the value chain and provide technical expertise on alternatives;
- ensure the **development, commercialisation, deployment and uptake of safe and sustainable-by-design substances, materials and products** through financial support<sup>25</sup> – in particular to SMEs – **under Horizon Europe**, cohesion policy, the LIFE programme, other relevant EU funding and investment instruments and public-private partnerships;
- map and address **safe and sustainable-by-design skills** mismatches and competence gaps, and ensure adequate skills at all levels - including in vocational and tertiary education, research, industry and among regulators;
- establish, in **close cooperation with stakeholders**, **Key Performance Indicators** to measure the industrial transition towards the production of safe and sustainable chemicals;
- ensure that the **legislation on industrial emissions** promotes the use of safer chemicals by industry in the EU by requiring on-site risk assessments and by restricting the use of substances of very high concern.



- European Commission; COM(2020) 667 final
- Report on CSS KPIs: European Commission, Directorate-General for Internal Market, Industry, Entrepreneurship and SMEs, *Key performance indicators for the chemicals strategy for sustainability : final report*, Publications Office of the European Union, 2023, <https://data.europa.eu/doi/10.2873/9209>

# SRIP for safe and sustainable Chemicals and Materials

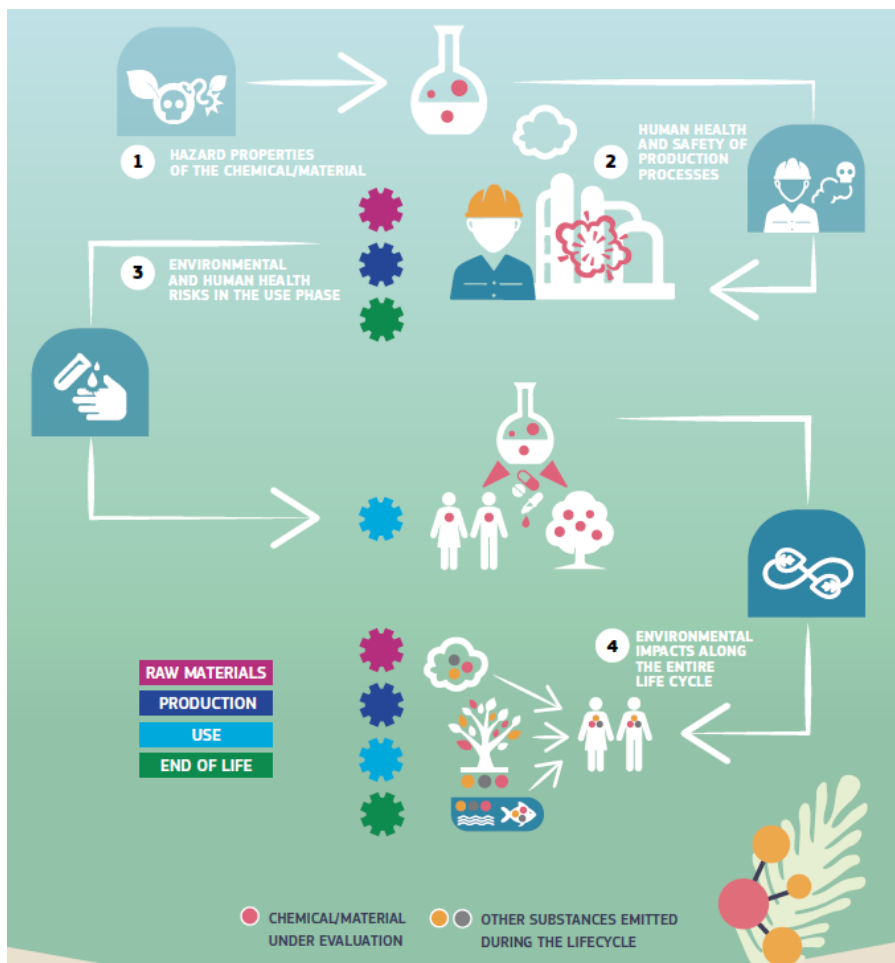
October 2022



|  |           |
|--|-----------|
| <b>3. Enablers and cross-cutting aspects</b>                               | <b>9</b>  |
| 3.1. FAIR data and open platforms  | 9         |
| 3.2. Validation and standardised test guidelines                           | 11        |
| 3.3. Skills, education and training  | 12        |
| 3.4. Green and innovative business models                                  | 13        |
| <b>4. Safe and sustainable by design</b>                                   | <b>15</b> |
| 4.1. Modelling and characterisation  | 15        |
| 4.2. Life-cycle assessment   | 16        |
| 4.3. Development of safe and sustainable by design alternatives            | 18        |
| <b>5. Safe and sustainable production processes and technologies</b>       | <b>20</b> |
| 5.1. Sustainable supply of primary raw materials                           | 21        |
| 5.2. Sustainable supply and recycling/upcycling of secondary raw materials | 22        |
| 5.2.1. Recuperation and recycling/upcycling of waste                       | 22        |
| 5.2.2. Valorising emissions  | 23        |
| 5.3. Clean, green and efficient production processes                       | 24        |
| <b>6. Exposure</b>   | <b>26</b> |
| 6.1. Exposure monitoring   | 27        |
| 6.2. Exposure models   | 29        |
| <b>7. Hazard assessment</b>  | <b>31</b> |
| <b>8. Risk assessment</b>  | <b>35</b> |
| <b>9. Decontamination and remediating pollution</b>                        | <b>37</b> |



# Safe and sustainable-by-design – set-up of the framework



## Step 1

Hazard properties of the chemical/material

## Step 2

Human health and safety of production processes

## Step 3

Environmental and human health risks in the use phase

## Step 4

Environmental impacts along the entire life cycle





# Safe and sustainable-by-design timeline (2)

DOCUMENTS

**February 3, 2023**  
Publication draft report  
on case study: **plasticisers  
in food contact**



**March 2, 2023**  
Survey on JRC report and  
overall framework

→ Cefic gave input



**January 2025**  
Implementation of SSbD  
framework



MEETINGS



**February 9/10, 2023**  
Workshop on case  
studies:  
plasticisers in food contact  
(JRC), halogen-free flame  
retardants in ITC  
(Clariant/BASF), enzymes  
in textile scouring  
(Novozymes)



**Q4 2023**  
Second Workshop on case  
studies



# Feedback first SSbD Case Studies

Plasticizers in  
food contact  
*JRC*

Halogen-free flame  
retardants in ICT  
*Clariant/BASF*

Enzymes in Textiles Scouring  
*Novozymes*

## ***Lessons learned by JRC and industry:***

- Communication/information flow and availability of data remains a challenge for all steps
- Coupling the SSbD assessment with the internal innovation process of the company is crucial
- For the hazard assessment (step 1), there is a big complexity and need of resources and expertise needed is underestimated, despite available REACH dossiers
- Step 2 (human health and safety in production and processing phase): highly challenging (upstream processes of suppliers)
- Trade-offs will be necessary



# Key points from Cefic feedback on EC SSbD survey March 2023

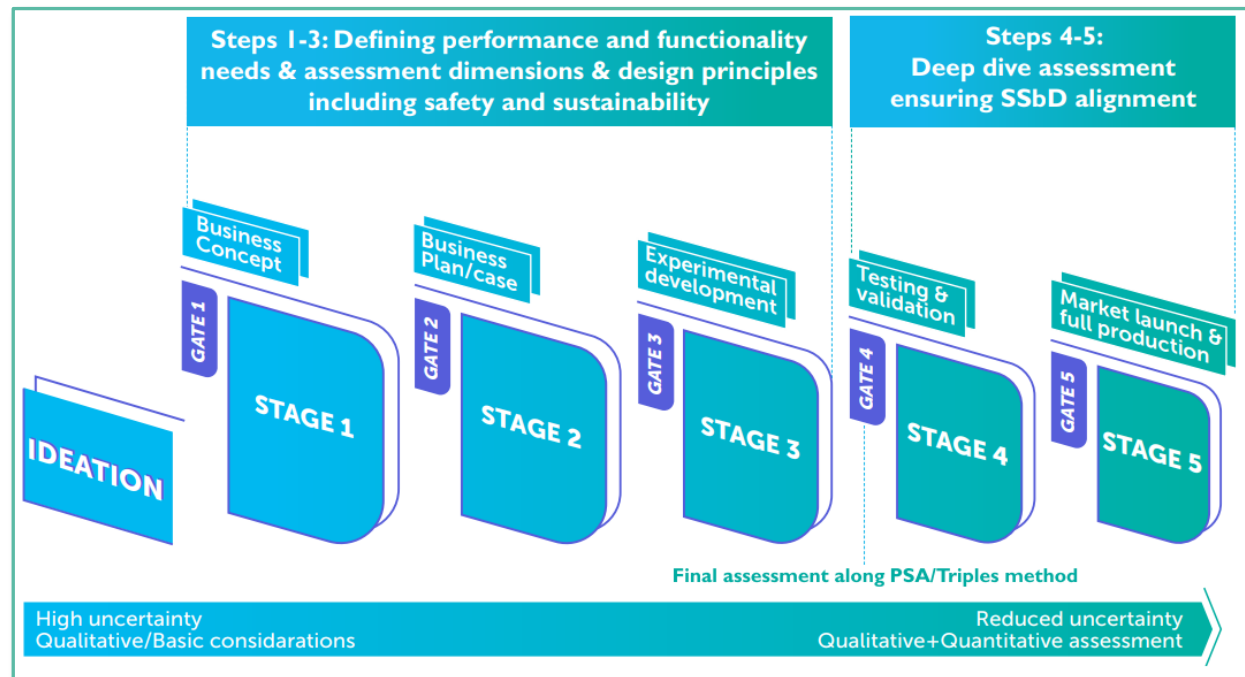
- The proposed framework as it stands is experienced as **complex, highly resource intensive and too distant from innovation practices** in the companies as well as extremely data demanding.
- The Commission should more clearly stress and **increase visibility of the purpose and benefit of the SSbD concept**. This includes also a clarification of the **intended link between the framework and innovation processes**.
- The SSbD framework should focus on the development of guidance on design aspects such as **circularity, durability and functionality** as well as the **broader sustainability and socio-economic assessment criteria**, hereby taking a life-cycle approach.
- Information on the upcoming regulatory measures is **important to inform the innovation process**. The use of **cut-off criteria is not the recommended path forward** e.g. it would prohibit a demonstrated safe use of certain chemicals and materials with proven sustainability benefits.
- The framework should elaborate and give guidance **on trade-off decision taking** which is inherent to all innovation processes, especially regarding the aspects of technical performance of chemicals and materials vs. e.g. immediate sustainability aspects.

**Cefic commits to continue facilitation of this co-creation process with the EC, bringing together all relevant stakeholders.**





# Cefic work on Safe and sustainable-by-design



- Proposal for guiding design principles for a selected set of safety and sustainability considerations, dimensions or criteria to be assessed at the level of product-application combination in a stage-gate process during innovation is made.



<https://cefic.org/a-solution-provider-for-sustainability/safe-and-sustainable-by-design/>

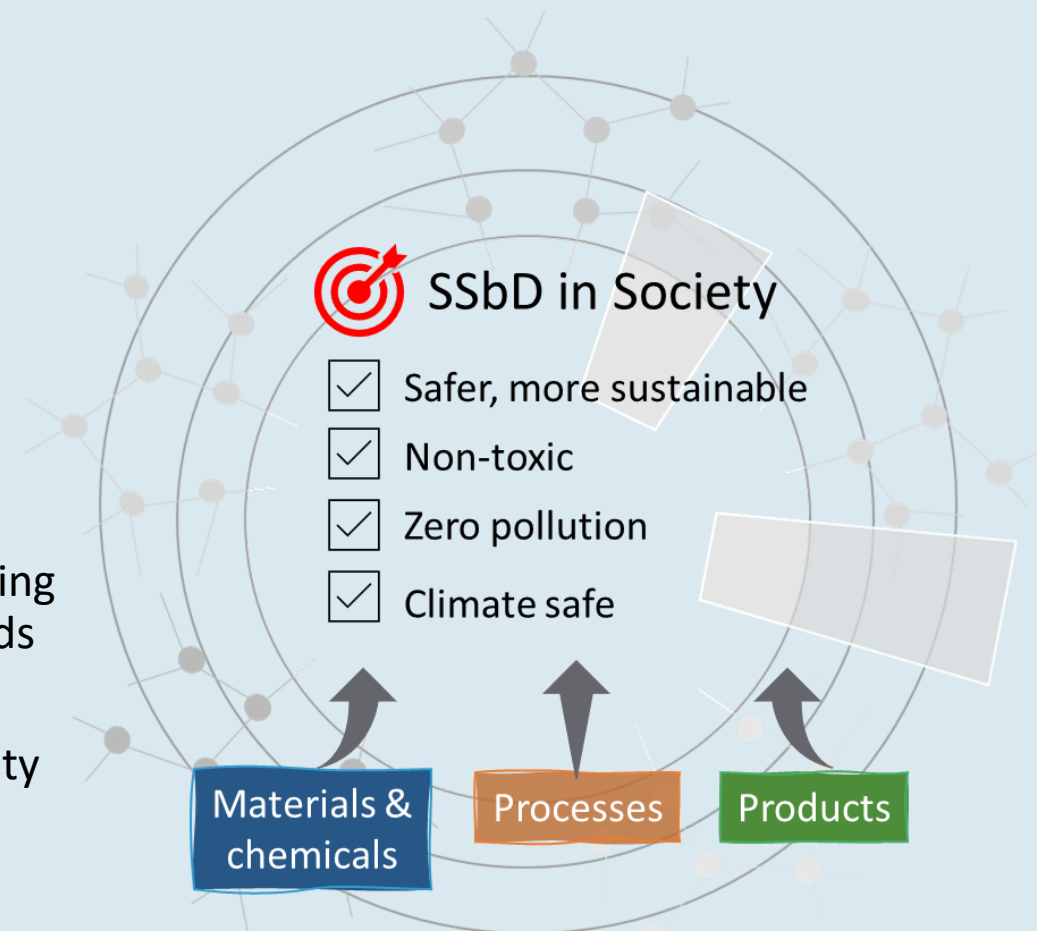
The background of the slide features a blue-tinted molecular structure with spheres and connecting rods, creating a scientific and technological feel.

# **The international ecosystem for accelerating the transition to Safe-and-Sustainable-by-design materials, products and processes**

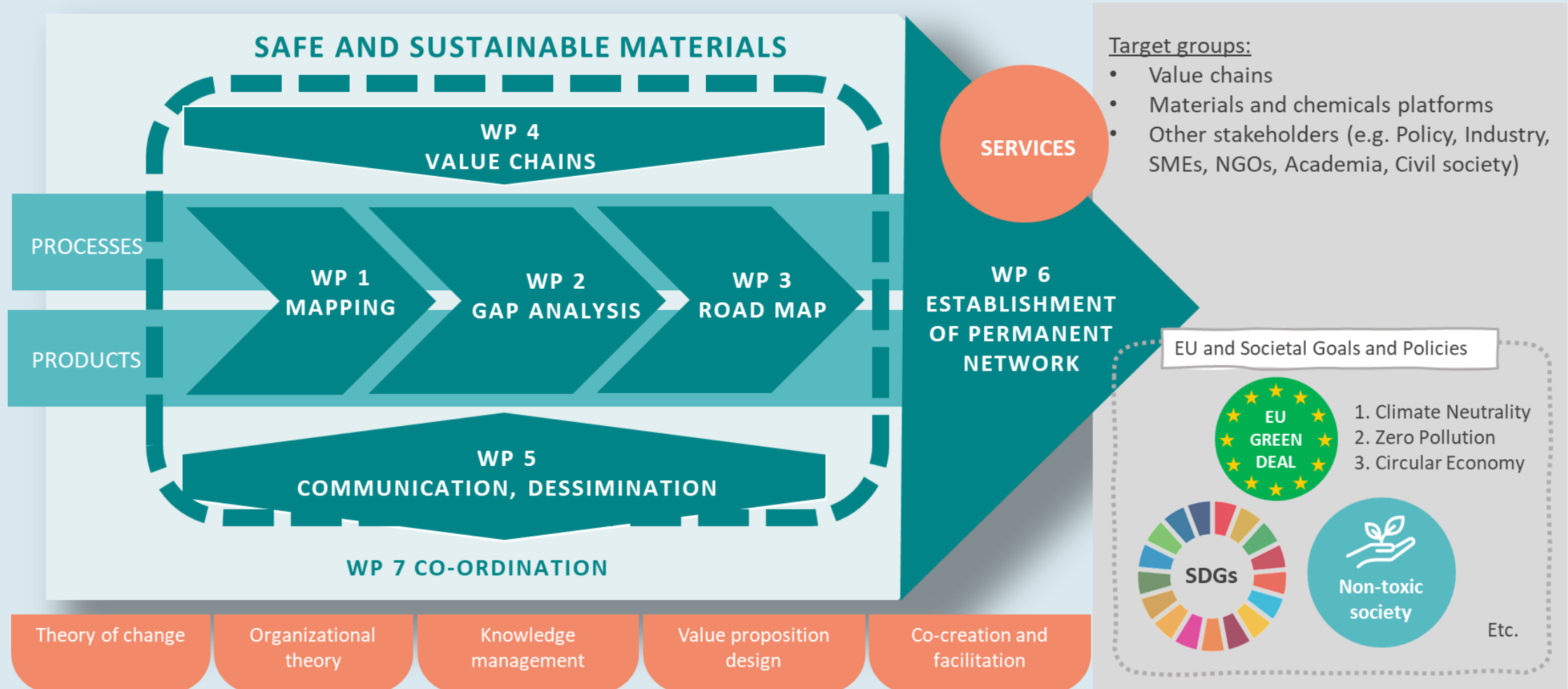
# Scope of the project

The IRISS project aims to connect, synergize and transform the SSbD community in Europe and globally towards a life cycle thinking

- Develop a **global permanent network** for long term cooperation between the networking members, engaging partners beyond the consortium, throughout and beyond the duration of the project
- Strongly support the **SSbD implementation** in industry **along value chains** to achieve more safe and sustainable products for society
- Focus on **materials including both products and processes**, considering the extensive progress to-date in chemicals and nanotechnology fields
- Establish cooperation mechanisms with relevant international initiatives to **align** and leverage the extensive international community
- Establish **synergy** with industry, EC and the projects that are working with SSbD concepts
- Building, sharing and transferring the **skills and knowledge** on SSbD



# Organisation and activities



# Development of SSbD supportive roadmap



## Packaging

(IPC; Industrial Technical Centre for Plastics and Composites)

## Textiles

(ETP; EU Technology Platform for the Future of Textiles & Clothing)

## Automotive

(CLEPA; European Association of Automotive Suppliers)

## Energy materials

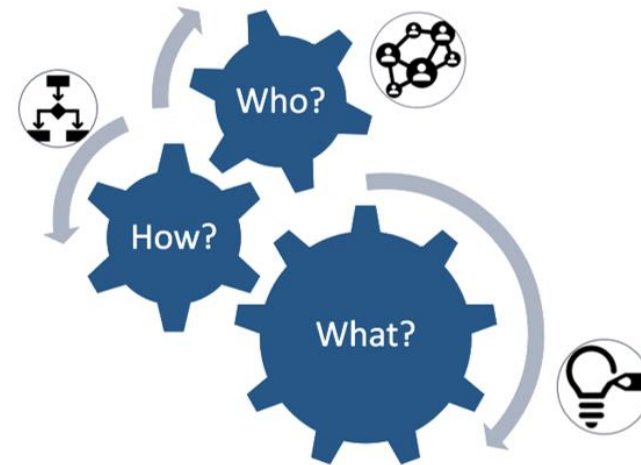
(EMIRI; Energy Materials Industrial Research Initiative)

## Electronics

(INL; International Iberian Nanotechnology Laboratory)

## Construction

(EFCC; European Federation for Construction Chemicals)



- **Development of value chain specific SSbD supportive roadmaps with agendas for:**
  - research needs
  - skills, competences and education needs, and
  - knowledge and information sharing needs
- **Translate the value chain specific SSbD supportive roadmaps to a generalized roadmap**



# Towards an efficient science-policy-industry interface

Building structural and efficient information sharing process and network



## Science:

Initial steps on operationalization of SSbD

- **IRISS-NSC collaboration**
- **IRISS-PARC collaboration**
- **IRISS-ongoing H2020 and HE projects**

Bringing science to harmonization and standardization

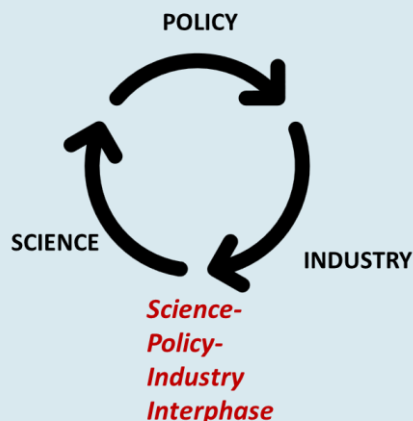
- **IRISS-OECD synergies**



## Policy:

IRISS structural dialogue with:

- **EC RTD**
- **EC JRC**



## Industry:

**Cefic coordinates SusChem NTPs and 7 value chains representatives**

- **Packaging** (IPC; Industrial Technical Centre for Plastics and Composites)
- **Textiles** (ETP; EU Technology Platform for the Future of Textiles & Clothing)
- **Construction chemicals** (EFCC; European Federation for Construction Chemicals)
- **Automotive** (CLEPA; European Association of Automotive Suppliers)
- **Energy materials** (EMIRI; Energy Materials Industrial Research Initiative)
- **Electronics** (INL; International Iberian Nanotechnology Laboratory)
- **Fragrances** (IFRA; The International Fragrance Association) – new VC



# Our partners and network



## Contact and more information

### Project coordinator:

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[www.iriss-ssbd.eu](http://www.iriss-ssbd.eu)



#IRISS\_SSbD

IRISS – International SSbD network

**JOIN THE IRISS NETWORK:** <https://www.iriss-ssbd.eu/english/ivl/project/iriss/join-the-network.html>

# Thank you.

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**About Cefic**

Cefic, the European Chemical Industry Council, founded in 1972, is the voice of large, medium and small chemical companies across Europe, which provide 1.1 million jobs and account for 15% of world chemicals production. Cefic members form one of the most active networks of the business community, complemented by partnerships with industry associations representing various sectors in the value chain. A full list of our members is available on the Cefic website. Cefic is an active member of the International Council of Chemical Associations (ICCA), which represents chemical manufacturers and producers all over the world and seeks to strengthen existing cooperation with global organisations such as UNEP and the OECD to improve chemicals management worldwide

