

SAFE AND SUSTAINABLE BY DESIGN: FUNDAMENTOS, EVOLUCIÓN Y PERSPECTIVAS EUROPEAS

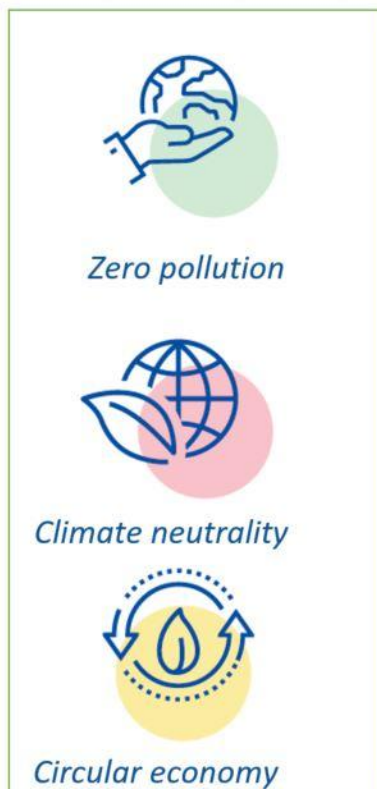
Asamblea General SusChem Espana

14 Octubre 2026, Madrid

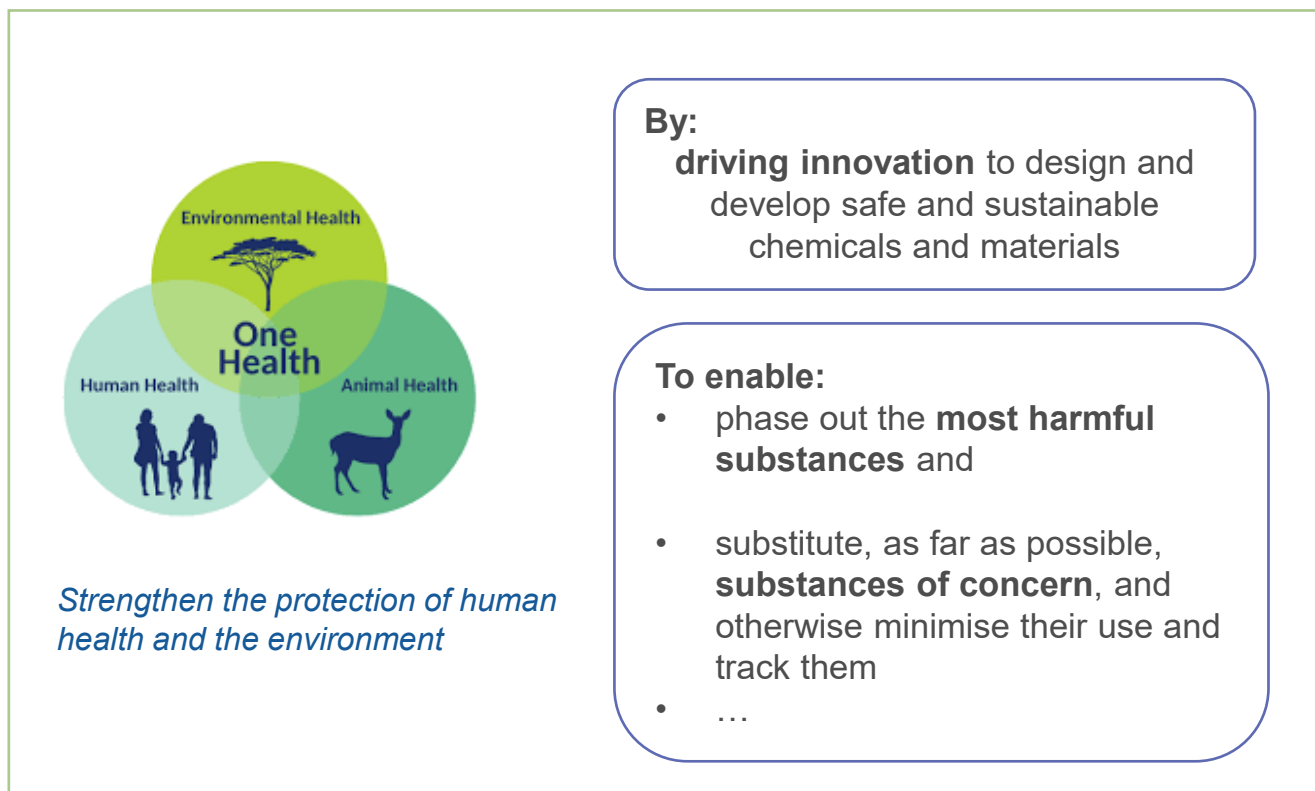
Irantzu Garmendia Aguirre, JRC

Green Deal and Chemical Strategy for Sustainability (CSS)

The EU Green Deal



Chemicals Strategy for Sustainability (CSS)



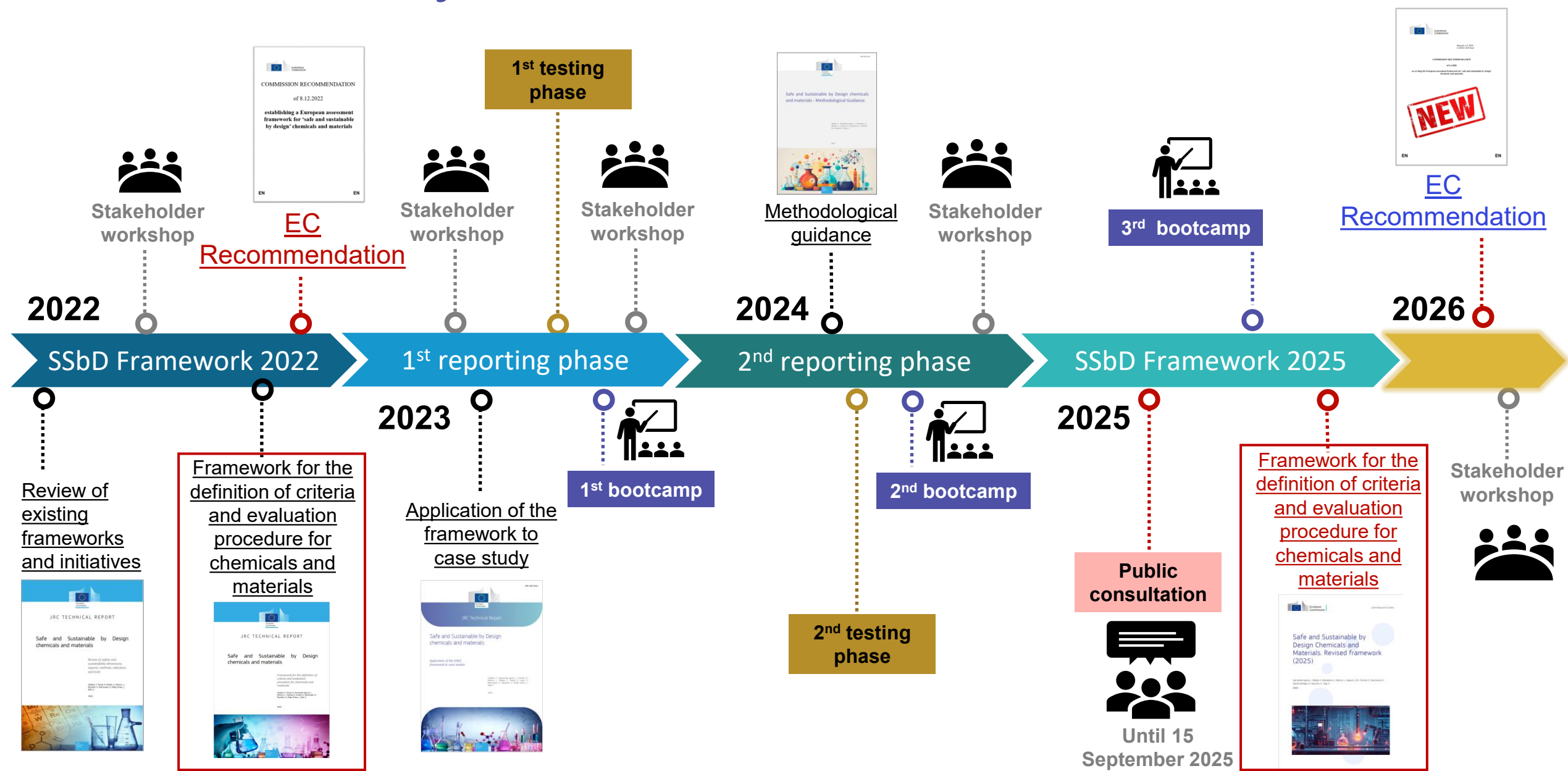
CSS Action Plan

Develop safe and sustainable by design (SSbD) Framework

JRC



A brief History of EC SSbD



Strengthening innovation in the Framework



COMPETITIVENESS COMPASS



EC revised SSbD Framework

2022

SSbD Framework 2022

1st reporting phase

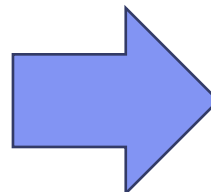
2024

2nd reporting phase

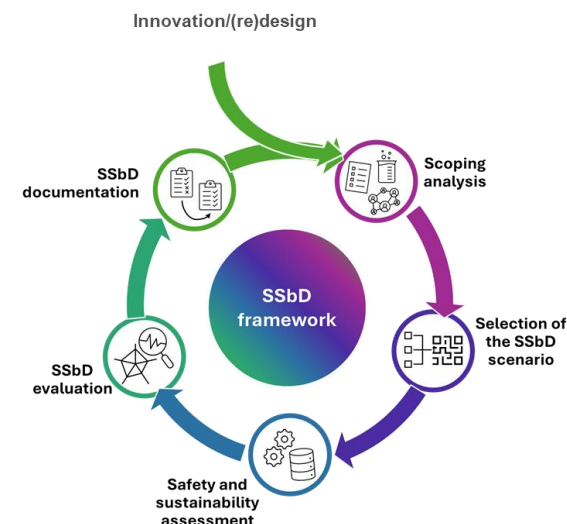
2026

SSbD Framework 2025

2023



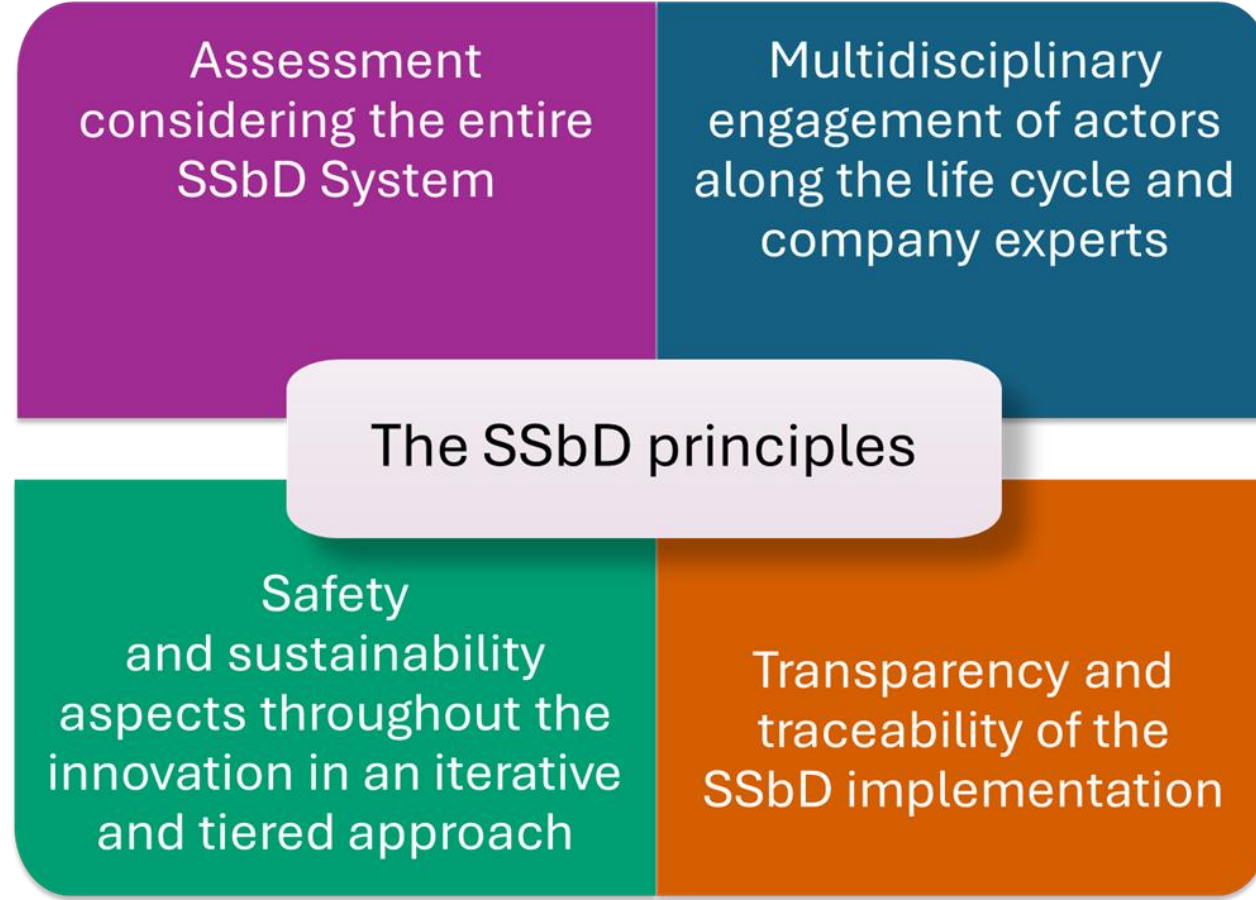
2025



- Static and linear
- Focus on safety and sustainability
- (re)design as the innovation component

- Dynamic and circular
- Focus on innovation from the (re)design to market readiness
- Safety and sustainability as an integral part of innovation

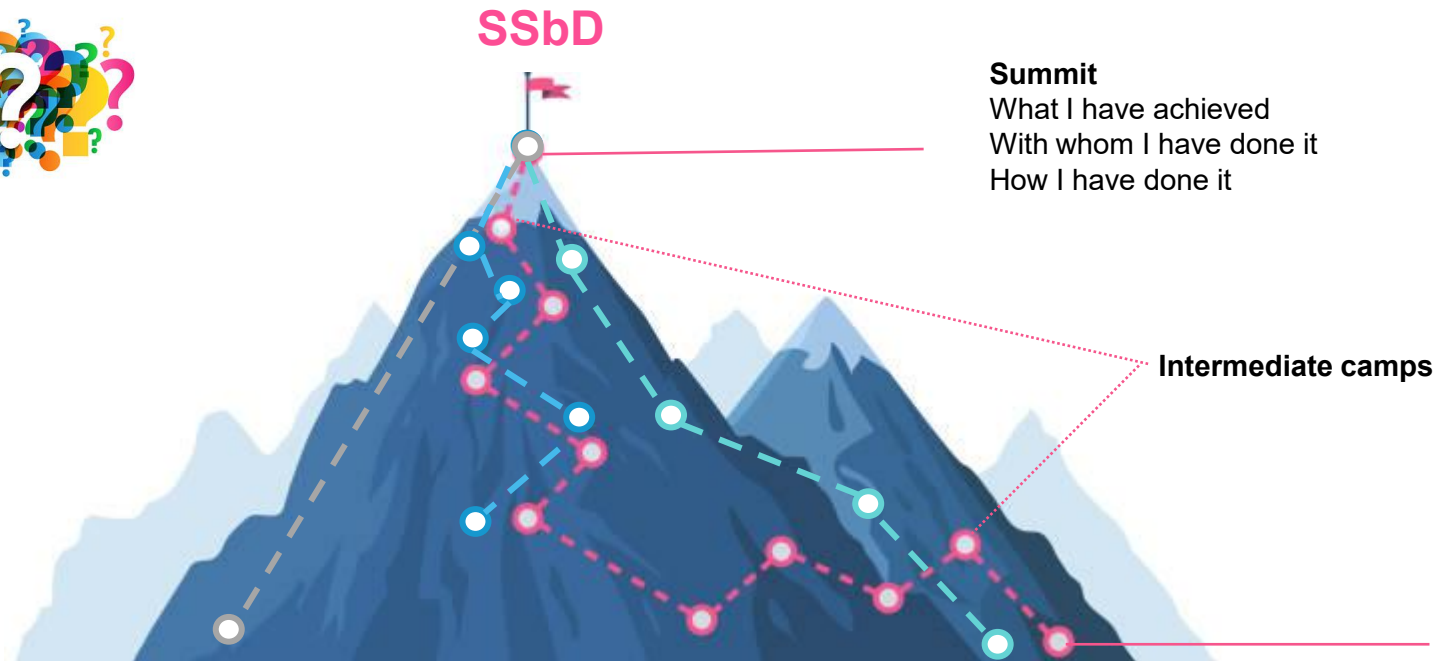
SSbD principles



SSbD principles

Holistic approach	Provides a broader view on safety and sustainability aspects	Supports the identification of gaps/needs, areas for improvement and potential trade-offs	Support informed decision-making	Continuous improvement
Life cycle/Value chain approach	Encourages value chain engagement	Can support early identification of important aspects to be considered along the value chain	Value chain uptake	Strengthens value chain collaboration
Pre-market/R&I approach	Provides a safe space for a trusted environment	Facilitates the dialogue and exchange	Regulatory readiness	Be prepared to tackle future needs
Transparent and traceable approach	Provides a summary of key aspects and important milestones in the innovation It allows for transparency on the implementation of the SSbD and the level of “completeness” It ensures traceability of the information It provides an instrument for communication			

The innovation



Summit

What I have achieved
With whom I have done it
How I have done it

Intermediate camps

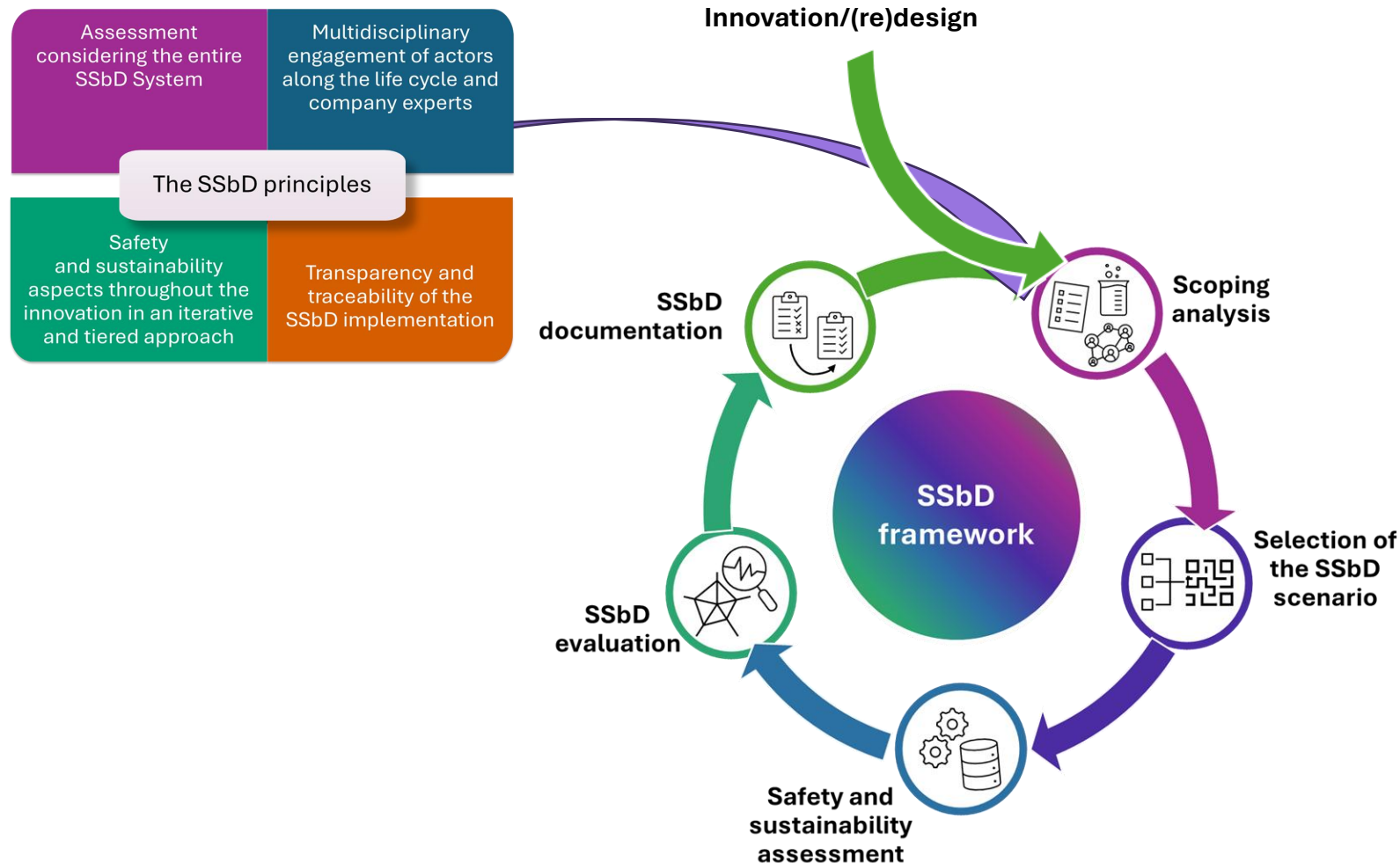
Base camp

Who am I
Where am I and why
What I want to achieve
What I am going to do to achieve it
With whom am I

Innovations can be triggered for example by the need of improving existing portfolios, new market/consumer requests, new ambitions and priorities and/or policy priorities



The Scoping analysis



Contextualizes the intended innovation into the SSbD.

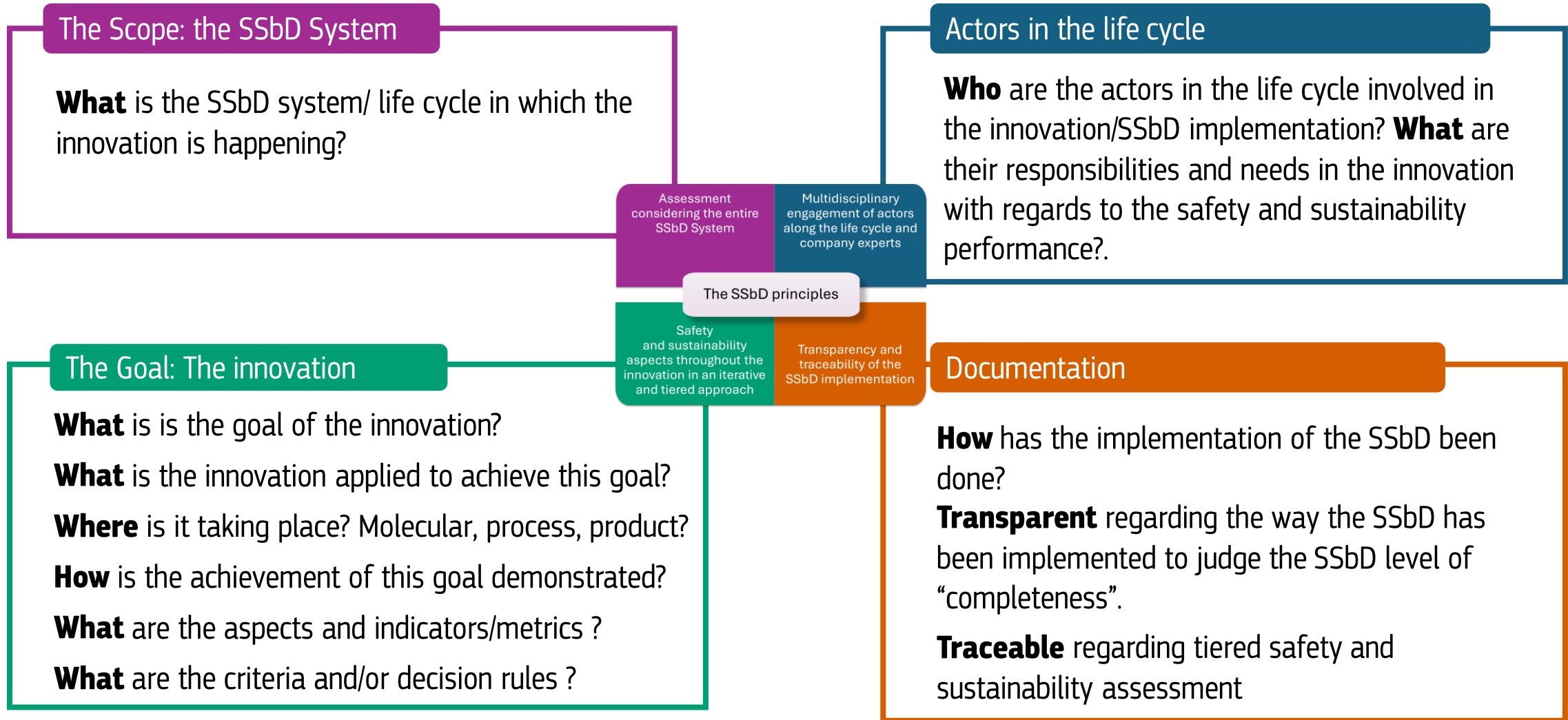
Includes the description of the system under study,

Definition of the objectives, (re)design actions and decision rules

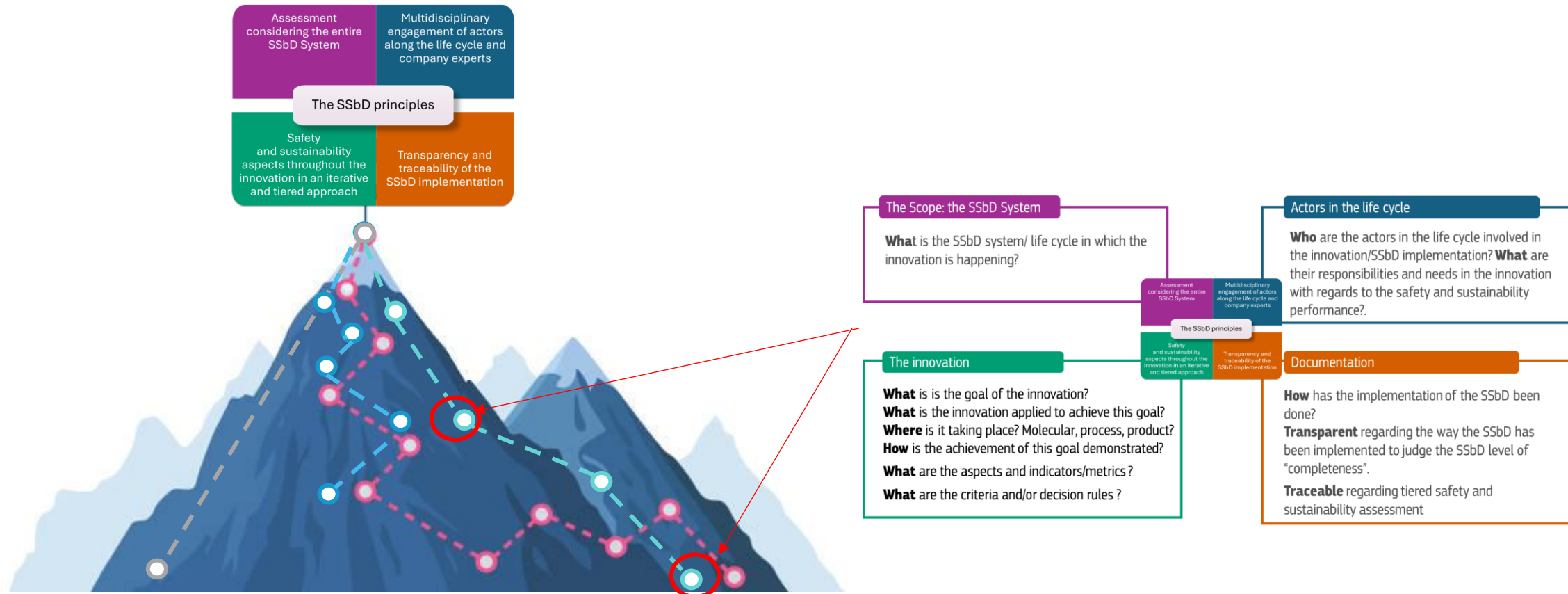
Identification the actors along the life cycle.

Provides structured assessment and decision-making support and guidance

The Scoping analysis



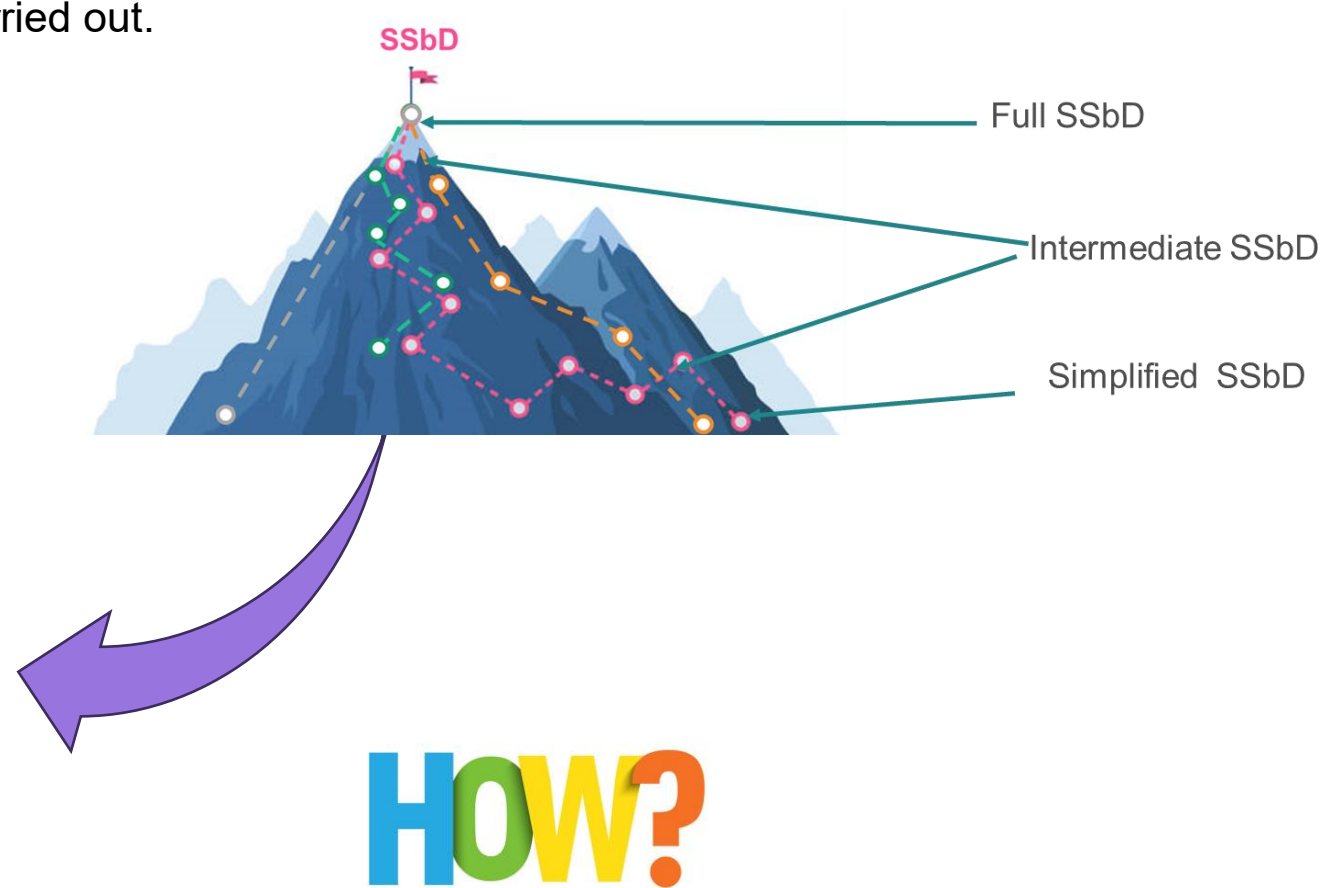
The Scoping analysis and Scenarios



SSbD Scenario: represents the outcome from the scoping analysis and identifies the entry point to the SSbD assessment, which allows to tailor the safety and sustainability assessments accordingly.

The SSbD Scenarios

SSbD scenario: the specific and real set of conditions (scoping analysis elements) that define the context in which the SSbD implementation and assessment is carried out.



Safety and sustainability

- **Intrinsic physical and (physico-)chemical properties:**
 - As common ground for safety and sustainability assessment.
 - These properties determine how chemicals and materials behave under different conditions and how they interact with other chemicals and materials.
- **Safety assessment:** quantifies both the potential of exposure and hazard associated with a specific chemical or material in specific scenarios to generate an absolute estimate of risk and reports results relative to maximum threshold levels, where these are available.
- **Sustainability assessment** focused on the overall processes related to the substance and its life cycle:
 - **Environmental sustainability assessment:** it evaluates the environmental impacts along the entire chemical/material life cycle by means of Life Cycle Assessment (LCA), assessing several impact categories.
 - **Socio-economic sustainability assessment:** describes how to assess aspects related to social fairness (e.g. working conditions and human rights) and competitiveness (e.g. vulnerabilities in the supply chain, skills shortages and Life Cycle Costs).

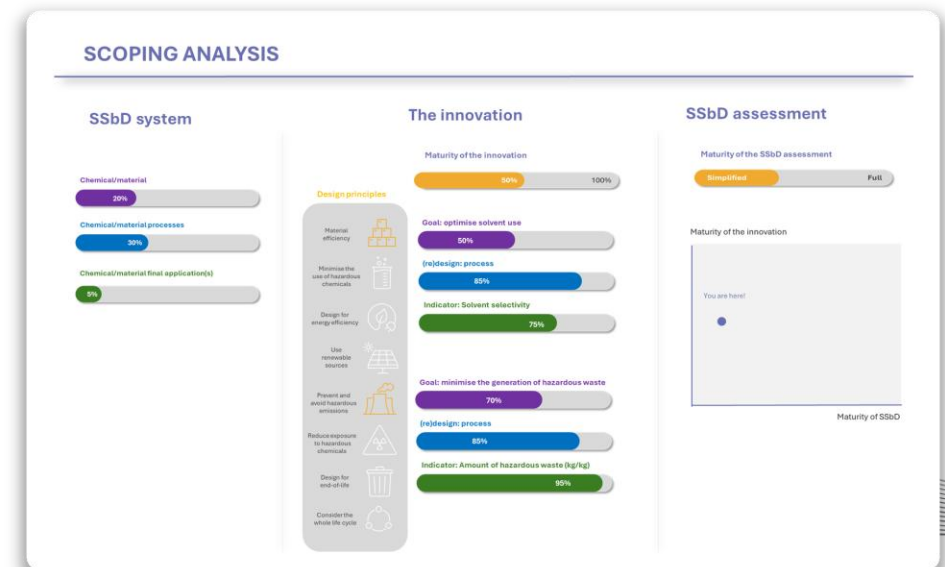
SSbD Evaluation

Presents the outcome of the safety and sustainability assessment and compares the results in an iterative manner with the objectives, (re)design actions and decision rules/criteria defined in the scoping analysis.

Possible outcomes of the evaluation, depending on the iteration, can be:

- Scope should be extended
- Objectives should be refined.
- (Re)design actions should be refined.
- Additional information is needed
- Sufficient degree of certainty has been achieved.

- Trade-offs and decision-making in the SSbD framework
- Uncertainty:
 - Maturity of the SSbD
 - Maturity of innovation
- Idea of dashboard



SSbD Documentation



- It allows **transparency** regarding the way the SSbD has been implemented and how its implementation has supported the iterative approach to reduce uncertainties with regard to the SSbD “completeness”
- It ensures **traceability** of tiered safety and sustainability assessment, as well as, of the data gaps and hot spots identification along the innovation, facilitating the reuse / sharing of the data generated or applied in the assessment.

The documentation should ideally include:

- A summary stating the important milestones in the innovation, the iterations and conclusion
- The summary table, with the main elements of the scoping analysis, the results of the safety and sustainability assessment
- The specific tables with the larger description of each of the elements in the summary



Revised SSbD Methodological guidance (2026)

- Updates the 2024 Methodological Guidance publication and clarifies certain aspects of the application of the revised SSbD framework (Garmendia Aguirre et al., 2025a).
- Main improvements:
 - Contextualization of the intended innovation through the scoping analysis
 - Tiered approach of the safety assessment
 - Tiered approach in the environmental sustainability assessment
 - Approach for the socio-economic assessment
 - Iterative and tiered evaluation process
 - More Examples



Innovation and substitution Hubs

- The Commission will create **EU Innovation and substitution Hub(s)** to overcome innovation barriers, accelerate the development of safer and more sustainable solutions and will explore collaborative approaches to the substitution of targeted chemicals.
- The **Safe and Sustainable by Design (SSbD)** chemicals will be embedded in the Innovation Hubs, providing technical guidance from early-stage innovation.
- The **SSbD framework** will promote collaboration among product designers, chemical companies, scientists and research organisations.
- The Commission will facilitate access to the necessary digital and physical infrastructure to develop, test and scale up **SSbD innovations**.
- The revised Commission recommendation on the framework for **SSbD chemicals (2025)** will reinforce EU chemical industry competitiveness by making the innovation process towards safer and more sustainable alternatives more efficient.

Muchas gracias



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