

Introduction to Integrated Impact Assessment for SSbD decision making

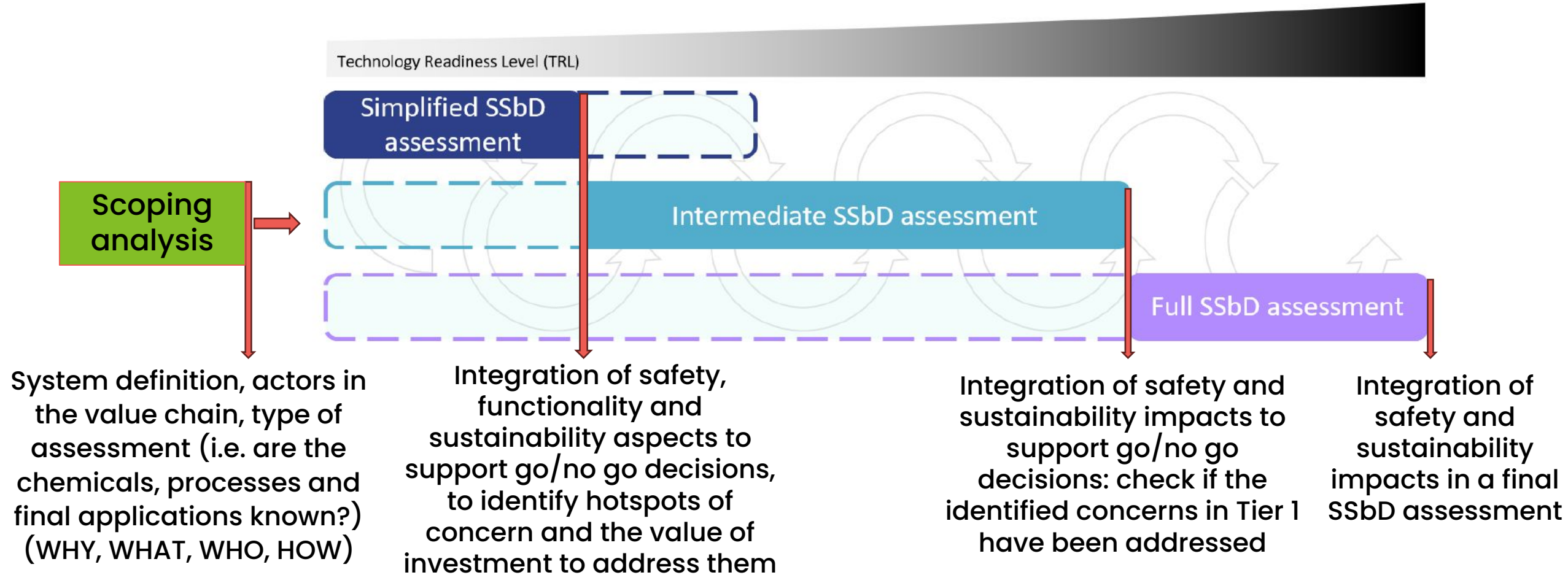
Lisa Pizzol – GreenDecision

Introduction

- The **Chemicals Strategy for Sustainability** identify the need for a Safe and Sustainable by Design (SSbD) approach to chemicals and novel materials.
- In December 2022 the European Commission issued a **recommendation** for establishing a European **assessment framework for 'safe and sustainable by design' chemicals and materials which** was developed by JRC.
- It is based on a **tiered** and **iterative approach** to safety and sustainability assessment along the **lifecycles** of chemicals/materials, which covers especially the **early stages of innovation** to identify “hotspots” as soon as possible.



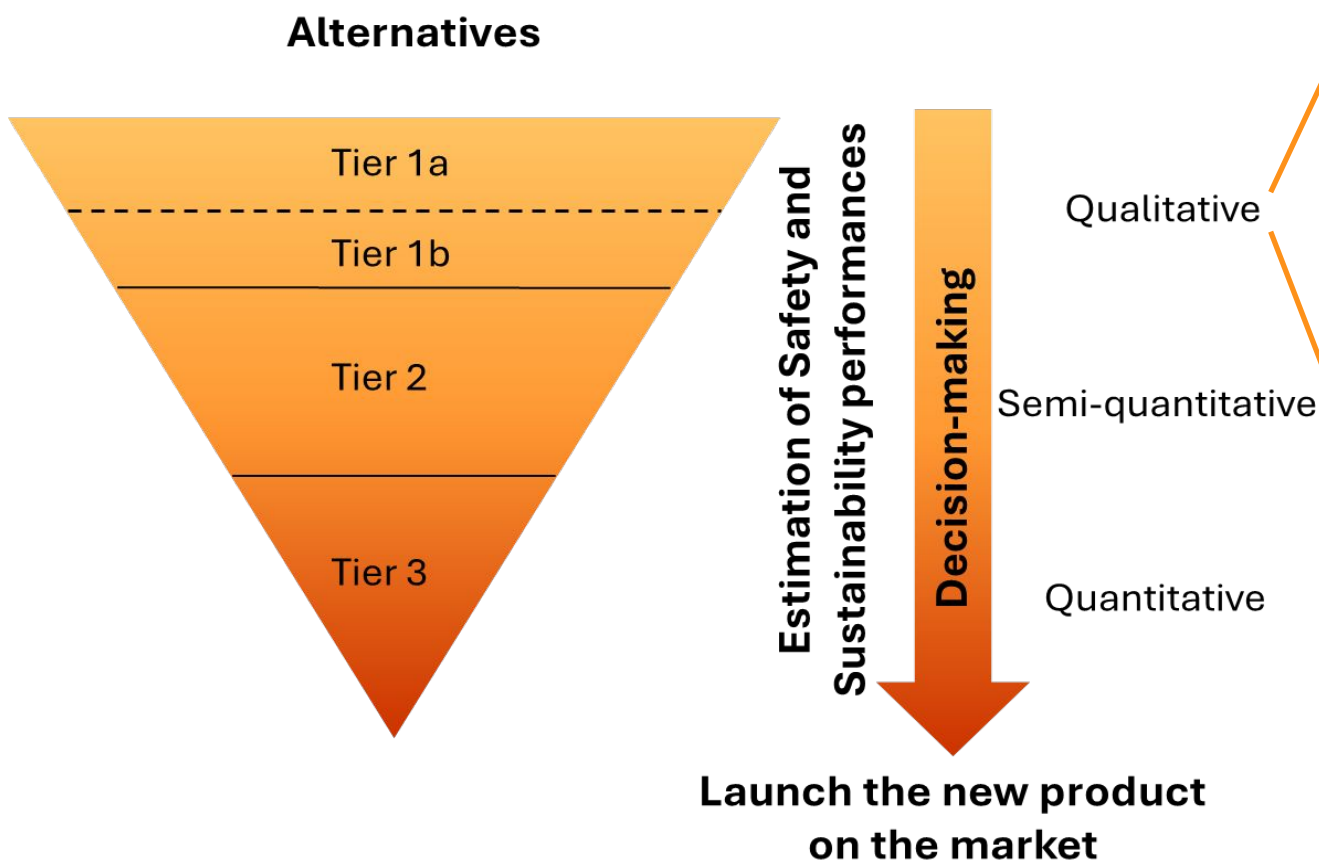
SSbD assessment levels



The separation among tiers should be seen as flexible rather than strict, considering that there are natural transitions and overlaps between the different tiers depending on the available information and the innovation stage



TIERS: different assessment levels/R&D stages, and related data availability



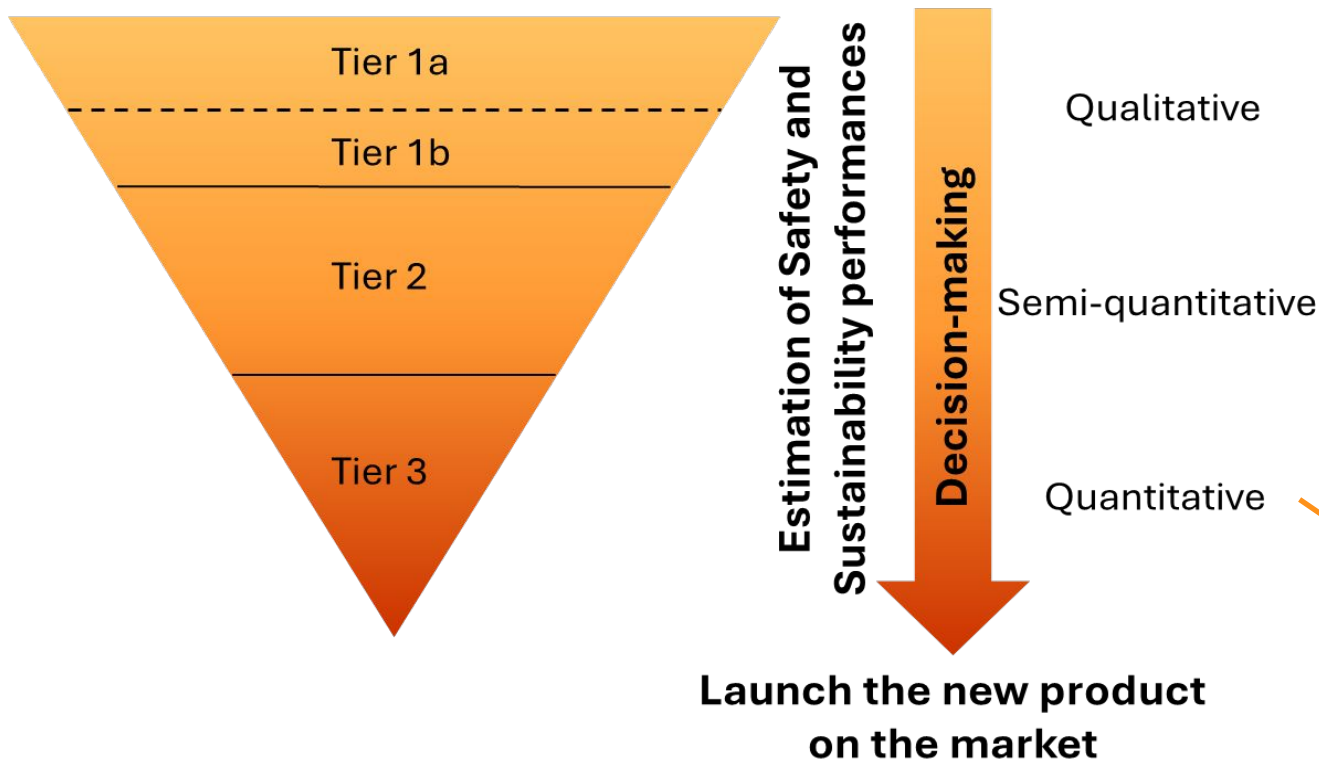
Tier 1a: a qualitative assessment (i.e. through questionnaires and data gathering) for the identification of the most promising alternatives, among a relatively high number of alternatives, based on selected relevant functionality, safety and sustainability indicators;

Tier 1b: a qualitative assessment (i.e. through questionnaires, data gathering, read-across and in silico tools) for the identification of hot-spots and data gaps, value of investment and for the prioritisation of alternatives that present the highest safety and sustainability performance and for the identification of those to be stopped;



TIERS: different assessment levels/R&D stages, and related data availability

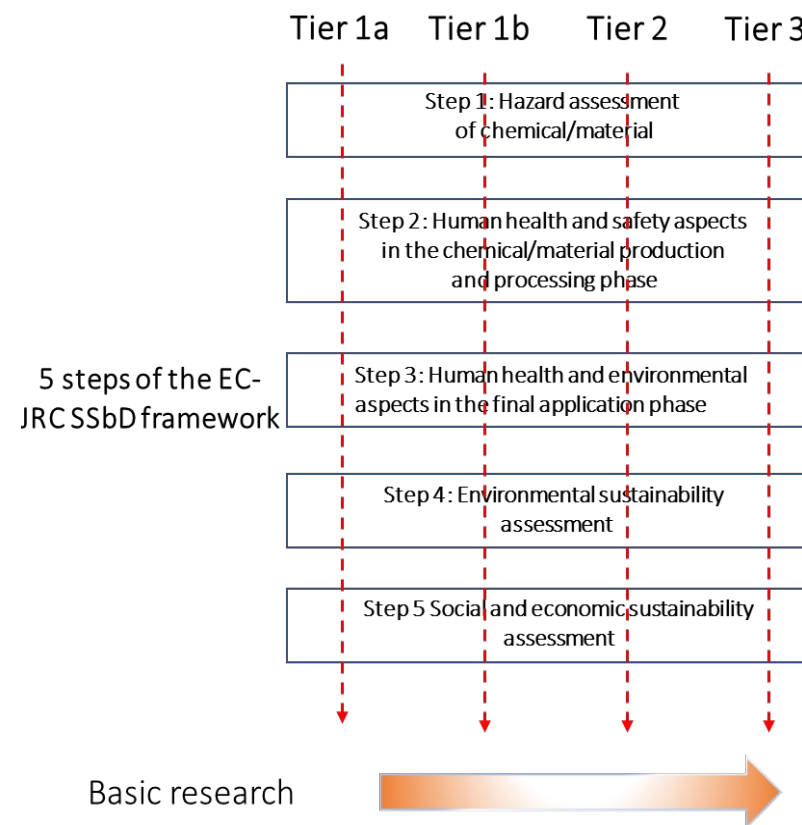
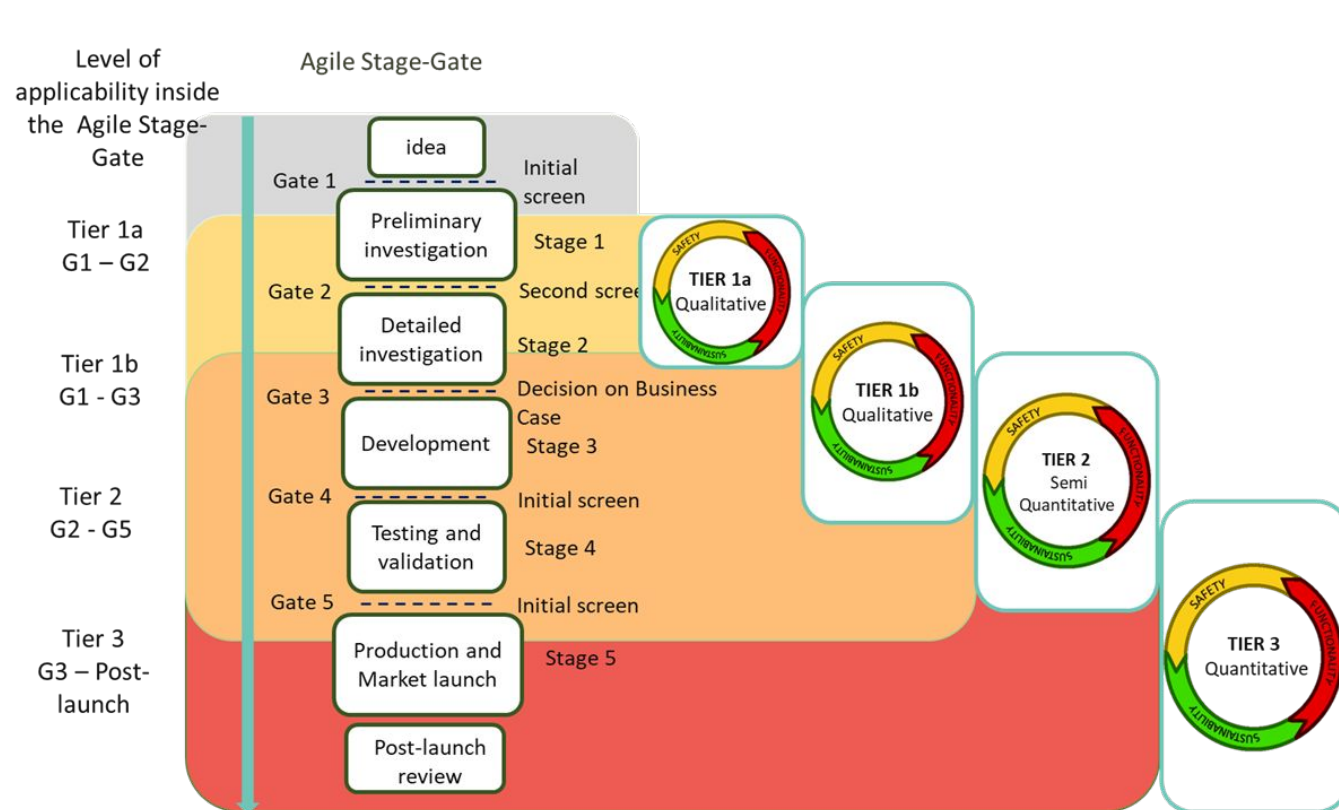
Alternatives



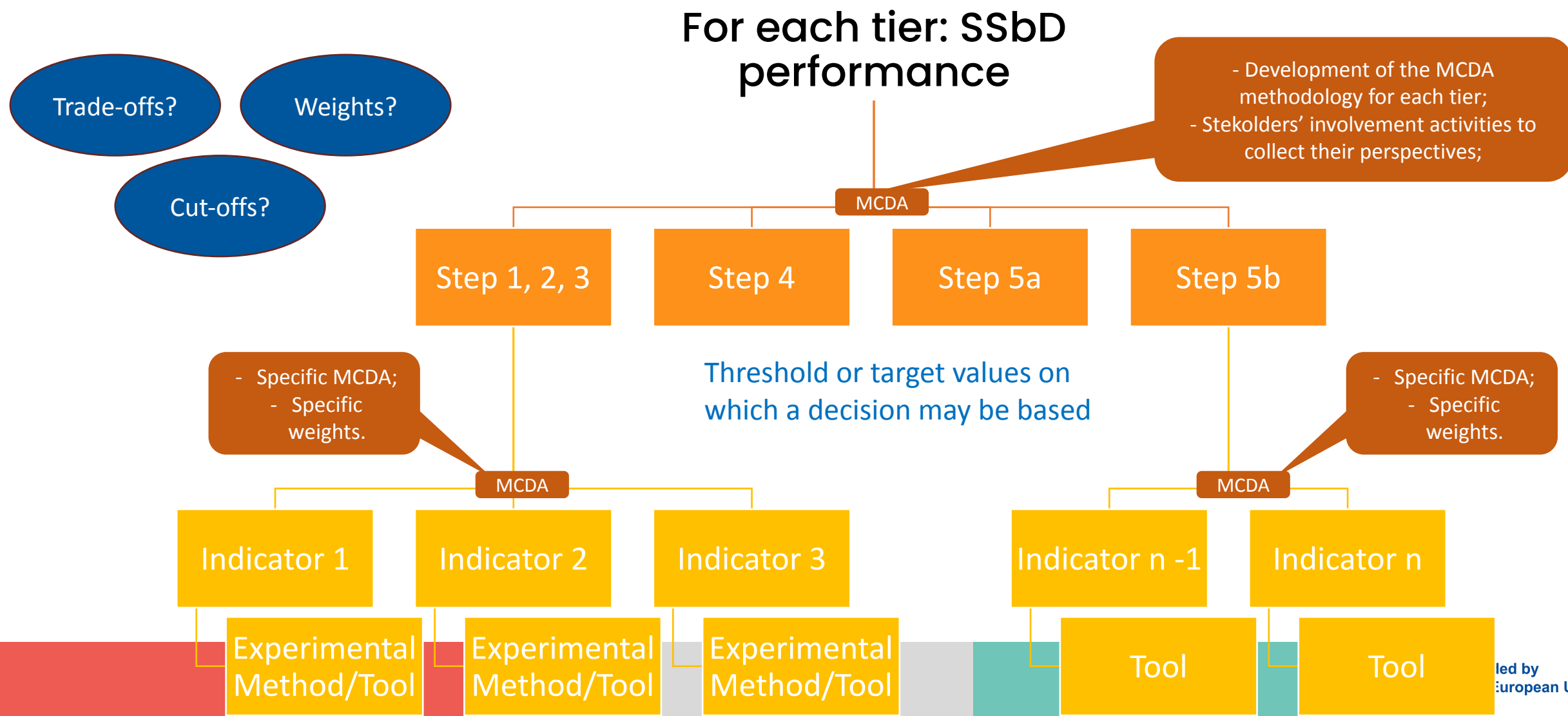
Tier 2: a screening assessment of safety and sustainability performance of the most promising alternatives based on semi-quantitative analysis (i.e. simple screening methods) to check if the identified concerns in Tier 1 have been addressed ;

Tier 3: a quantitative analysis (i.e. robust methods) of safety and sustainability performance for the deep assessment of safety and sustainability performance of specific alternatives in the later stage of development (regulatory compliance)

TIERS: different assessment levels/different objectives



Integrated Impact Assessment Approach (IIAA)



Simplified SSbD assessment: Tier 1, results example

Home

Dashboard

Functionality

Safety

Environment sustainability

Social sustainability

Economic sustainability

Results

Safety

Improvement of safety aspects

Raw Materials And Resources - Production ✓

Production Of The MCNM ✓

Production Of The Product Incorporating The MCNM ✓

Use Of The Product ✓

End-Of-Life Of The Product ✓

Questions

☐ Answer where YES means NEGATIVE impact to sustainability

☐ Answer where YES means POSITIVE impact to sustainability

Is this question extremely relevant for your assessment?

Benchmark

SIC@TiO2

Are any of the chemical components used to produce the Material/Product included in any authoritative lists of restricted and hazardous chemicals (e.g. candidate list of SVHC according to Article 57 of REACH)?	<input type="checkbox"/>	Yes	No
Are any of the raw materials carcinogenic?	<input type="checkbox"/>	Yes	No
Are any of the raw materials genotoxic (mutagenic)?	<input type="checkbox"/>	Yes	No
Are any of the raw materials toxic to the reproduction?	<input type="checkbox"/>	Yes	No
Any of the raw materials have endocrine disrupting properties relevant to human health?	<input type="checkbox"/>	Yes	No
Are any of the raw materials respiratory sensitiser?	<input type="checkbox"/>	Yes	Yes
Any of the raw materials have specific target organ toxicity?	<input type="checkbox"/>	Yes	Yes
Are any of the raw materials immunotoxic?	<input type="checkbox"/>	Yes	I don't know
Are any of the raw materials neurotoxic?	<input type="checkbox"/>	Yes	I don't know
Are any of the raw materials skin sensitiser?	<input type="checkbox"/>	Yes	Yes
Are any of the raw materials have adverse effects on eye/skin (e.g. eye damage/irritation, skin corrosion/irritation)?	<input type="checkbox"/>	Yes	Yes

100

90

80

70

60

50

40

30

20

10

0

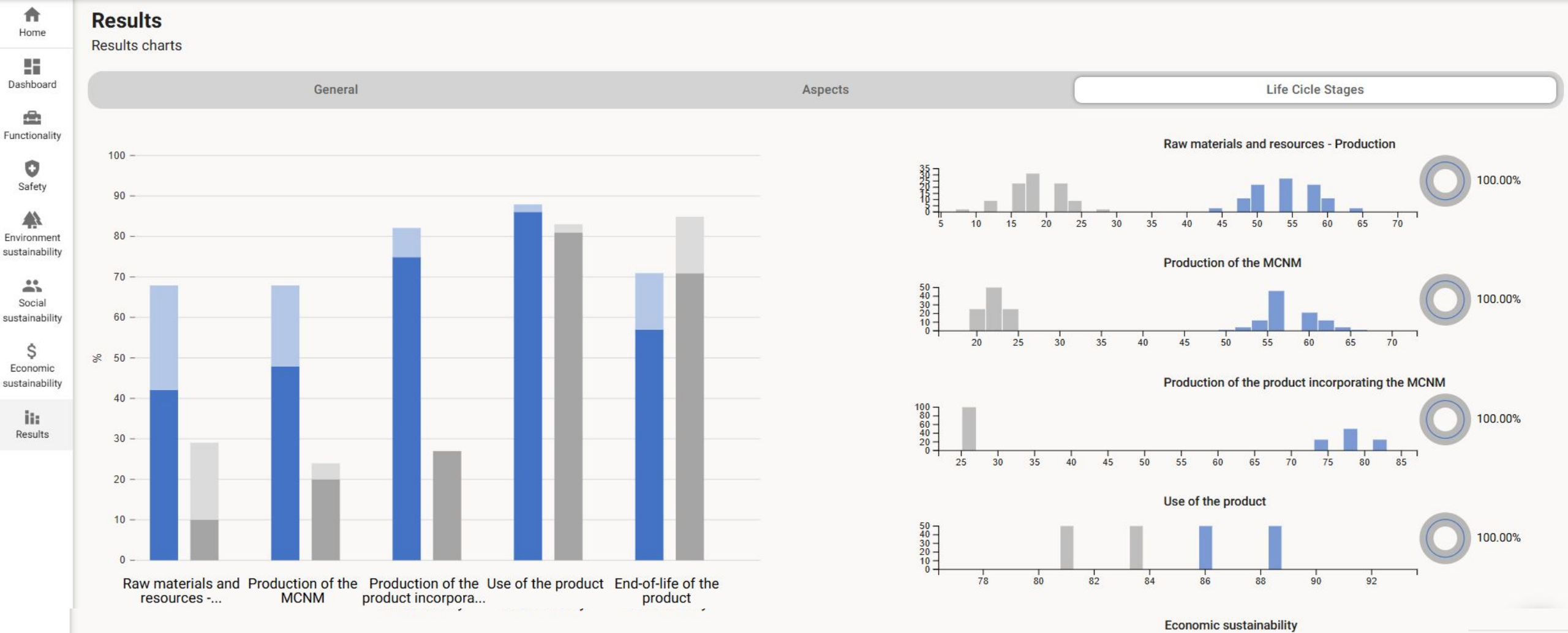
Benchmark

SIC@TiO2

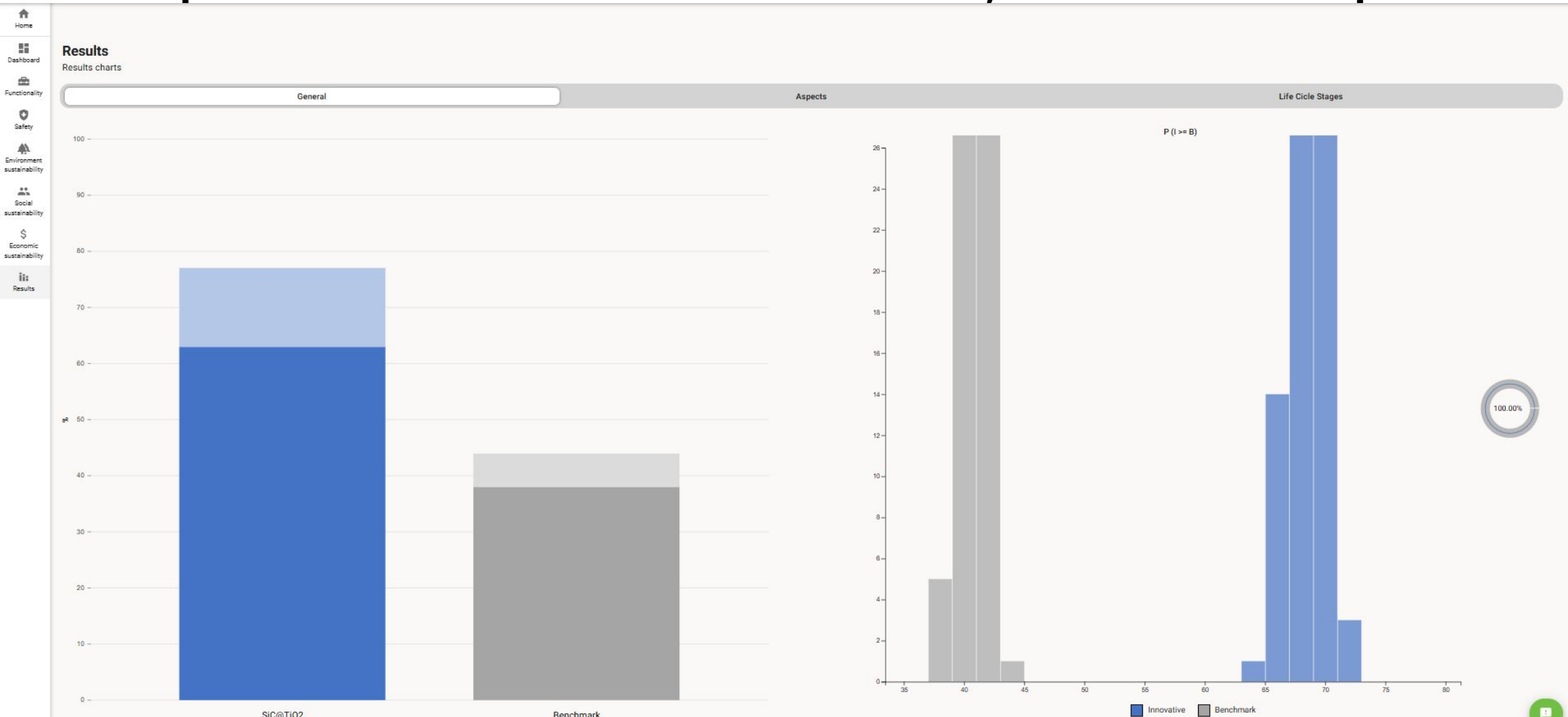
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Simplified SSbD assessment: Tier 1, results example



Simplified SSbD assessment: Tier 1, results example



Take home messages

- The SSbD framework aims to support the decision-making process along the entire innovation path
- It uses different assessment levels (and related experimental methods and tools) depending on – the R&D stages under assessment, – the objective of the SSbD assessment and – the related data availability)
- At each assessment level (i.e. Tier), suitable methodologies need to be developed to integrate the results of the safety, environmental S., social S. and economic S. assessments and to support the comparison of alternatives according to SSbD aspects
- Inclusion of stakeholder's perspectives/profiles

CONTACTS

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What is the integrated impact assessment approach IIAA?

It is a logical structure composed of different SSbD assessment levels (Tiers)

The final aim is to provide a SSbD evaluation (score?) for the different alternatives estimated at each assessed Tier

For each Tier, it assesses different aspects (safety, functionality, environmental, social, economic impacts)

It uses stakeholders' profiles (i.e., weights) to give different relevance to the assessed impacts

It includes Multi-Criteria Decision Analysis (MCDA) methodologies for the integration of the assessed impacts (one for each Tier)

