SUSTAINABLE PRODUCT INNOVATIONS FOR FAST-MOVING CONSUMER GOODS

Learning from companies' experiences for a more effective and accessible 'Safe and Sustainable by Design' framework

Link to full report

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INTRODUCTION

Advanced materials (including complex chemicals) represent a major opportunity for **disruptive innovation,** unlocking novel benefits for consumers.

It is essential to ensure that new products and innovations using these materials are **safe and sustainable by design.**

The European Commission Joint Research Centre (EC JRC) introduced its **Safe and Sustainable by Design (SSbD) framework** in 2022 to support product development.

As a global fast-moving consumer goods company, marketing many of the world's largest brands, **Unilever's innovation process already integrates safety and sustainability priorities.**

We offer a downstream user (of new materials) perspective and our experience in designing safe and sustainable products over many decades, providing **recommendations** for an evolution of the EC JRC SSbD framework.

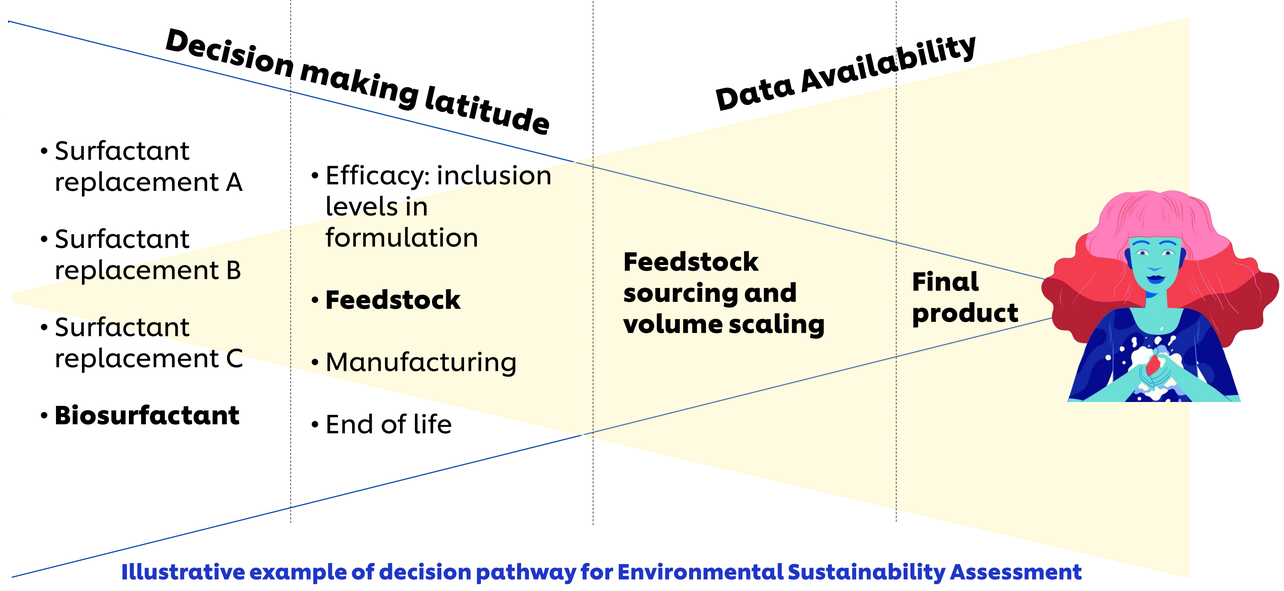
Our **case study** used to derive these recommendations focuses on a **biosurfactant used in Home Care products.**

AIMS & OBJECTIVES OF CASE STUDY

- Outline Unilever's current approach to safety and sustainability during innovation
- Provide reflections on the SSbD framework proposed by the EC JRC
- Offer recommendations for further development of the JRC SSbD framework

UNILEVER APPROACH TO SAFE AND SUSTAINABLE INNOVATION

	Ingredient Discovery	Ingredient Evaluation	Development & Testing	Production & Launch
Consumer Safety Assessment	Identification of key health effects through in silico approaches and/or available data to guide tech optimisation	Determine consumer exposure scenarios for proposed product type(s); conduct in vitro screening to reduce uncertainty for key health effects	Implement safety testing strategy; generate data for exposure-led key health effects	Final safety assessment for the marketed product type and commercial material specification
Occupational Safety Assessment	Evaluate major hazards / potential risks to help prioritise technology options	Characterise highest risks and conduct screening assessments for lead manufacturing routes	More detailed hazard assessments on lead manufacturing routes to enable scale up	Final risk assessments for processes manufacturing or using the new technology
Environmental Safety Assessment	Estimate environmental safety profile (fate & effects) through available data or read-across	Generate/source from supplier fate (ready biodegradation & log K_{IAM} for bioaccumulation) & effects (Daphnia, algae & NAMs for fish) data	Safety risk assessments conducted for expected market volumes and countries	Safety assessments updated with final launch & projected future market volumes to ensure environmental safety can be supported
Environmental Sustainability Assessment	Eco-design approaches to help narrow technology options	Screening assessment on limited impact categories to identify any potential gross negatives	Assess implications of technology options: i.e. volume scaling. Bespoke assessments such as LUCI-LCA	Full LCA/PEF compliant assessment, single environmental indicator footprint / material analysis (optional)



Illustrative example of decision pathway for Environmental Sustainability Assessment

KEY AREAS FOR IMPROVEMENT

Enabling Environment

Sustainable product innovation can only be truly embedded in company operations if an **enabling environment** is offered both by the **external policy context** and **individual business strategies.**

Scoring approaches

An aggregated score across all aspects of safety and sustainability removes the potential to **assess the acceptability of inevitable trade-offs**. Scoring aligned to the needs of Digital Product Passports / Ecolabelling should be considered.

Trade-offs

Expecting new chemicals to demonstrate improved profiles against all hazard endpoints and all sustainability impact categories may slow the **transition towards safe and more sustainable chemicals.** Trade-offs should be considered when **safety can be managed** through product design, production and well-defined use, enabling delivery of **substantial sustainability benefits**.

Use of NAMs

We strongly support the use of **non-animal New Approach Methodologies (or NAMs)** in safety and believe that the SSbD framework should not drive new animal testing.

Staged assessments

The current framework is structured around the safety and sustainability steps. Alignment to **innovation stages**, with **methods and approaches** adapted to information / data available at each stage, would enable better decision-making.

Absolute assessments

Absolute safety, defined by hazard alone, and **absolute sustainability**, referring to one identified use, is **not achievable in the short term** and **may not be desirable**. New chemicals should not be discarded if hazards can be managed through well-defined exposure.

RECOMMENDATIONS

- **Reconsider the conceptual framing**, moving away from absolute assessment.
- **Ensure alignment** to the existing stage gate innovation process.
- **Account for data availability and methodological feasibility** at each stage.
- **Develop approach** for dealing with **trade-offs** that encourages adoption within industry.
- **Develop the framework** for integrating new science as it develops.
- **Support sector-based initiatives** to generate and share data, methodologies and approaches focusing on:
  - Tier 1 pre-assessment / early-stage screening (e.g. rule-bases, question-sets etc.).

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