

# Designing safe and sustainable by design chemicals, materials and products



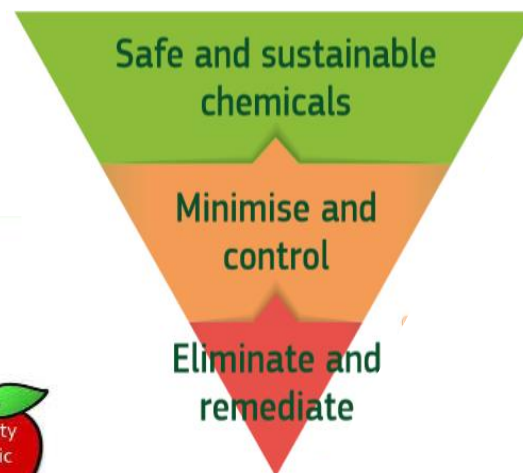
***Xenia Trier, Ph.D.***

*Expert on chemicals, environment and health  
European Environment Agency*

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# Why Safe and Sustainable by Design (SSBD)?



- **European Green Deal:**  
Prevent pollution, environmental degradation, biodiversity loss, resource depletion & climate change - at the same time
- **Chemical Strategy for Sustainability:**
  - **Aim:** Avoid harm to planet and people  
⇒ *from all chemicals and stressors to reduce absolute harm*
  - **Tool:** Prevent pollution by Industrial transition to SSBD

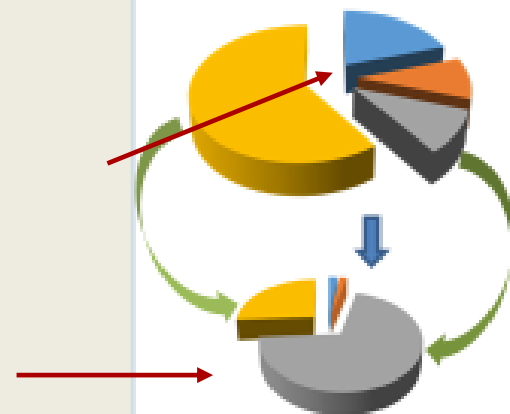
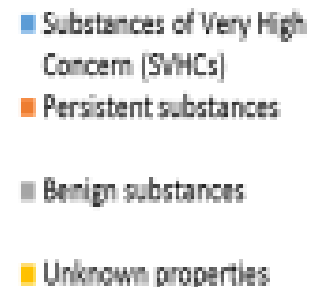


# SSBD methodological requirements

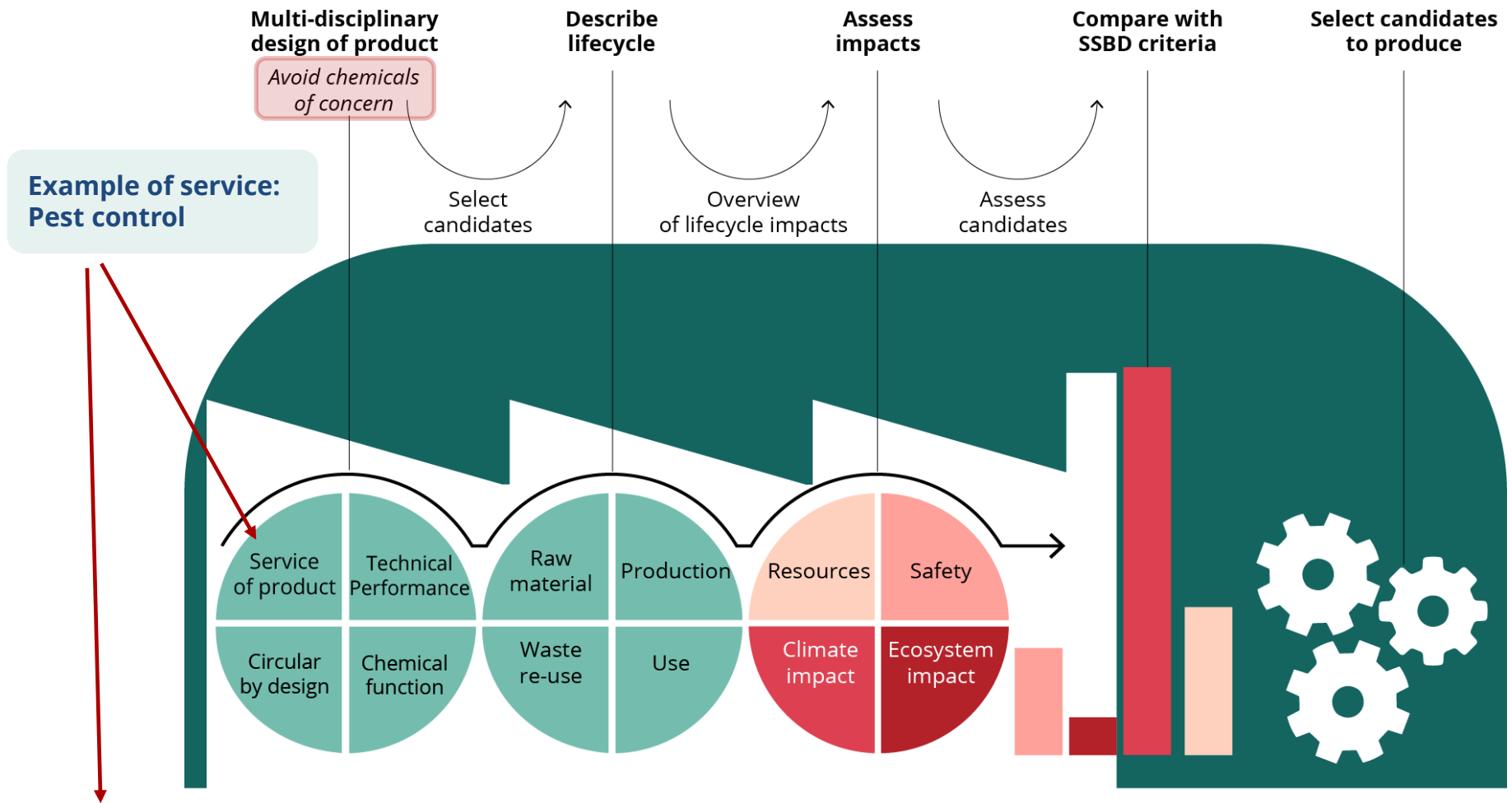
## – in the context of the Chemical Strategy for Sustainability

### CSS aim to *prevent harm to people and planet*

- **Harm:** to humans and the environment
  - Safety (toxicity to humans),
  - Ecosystem health (ecotoxicity, land use, biodiversity),
  - Resources (resource use and circularity),
  - Climate change
  - *Social and economic dimensions are not in the scope of the CSS*
- **Proactive:** avoid use of *known/suspected* substances of concern
  - avoid persistent chemicals that accumulate
- Effective policies and actions: **Reduce 'absolute' harm** not just relative. Calls for designs that
  - reduce total amount of used chemicals and materials
  - enables reuse/recycling of chemicals, materials, products
  - => calls for **reducing complexity** of chemical diversity, materials and products



# Safe and Sustainable by Design premarket design



Service (pest control) delivered by:

- Chemical pesticides?
- Physical removal?
- Biological methods?



**Focus on *chemicals and materials* alone limits innovation**, e.g. to drop-in chemical substitution  
**=> apply SSBD on products and processes as well**



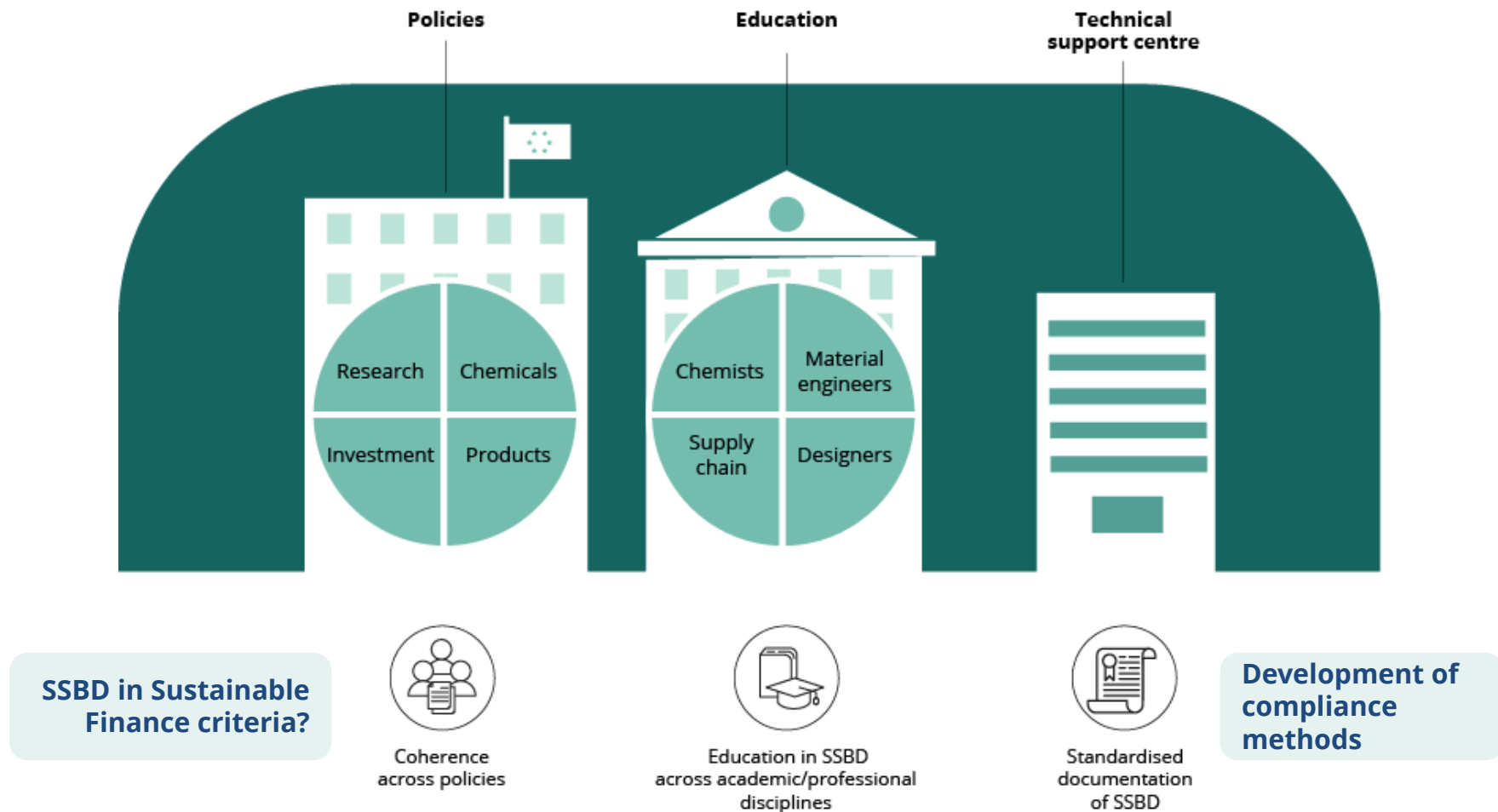
# Assessing Safe and Sustainable by Design

- **Meet sustainability goals** - *without compromising **safety**..*
- **Set min scores** to avoid burden shifting and to **create trust in SSBD**
- **(Societal) Protection goals can inform minimum and total scores**





# Safe and Sustainable by Design – creating an enabling environment



# How to foster a transition to Safe and Sustainable by Design food systems?



- **Trustworthy**

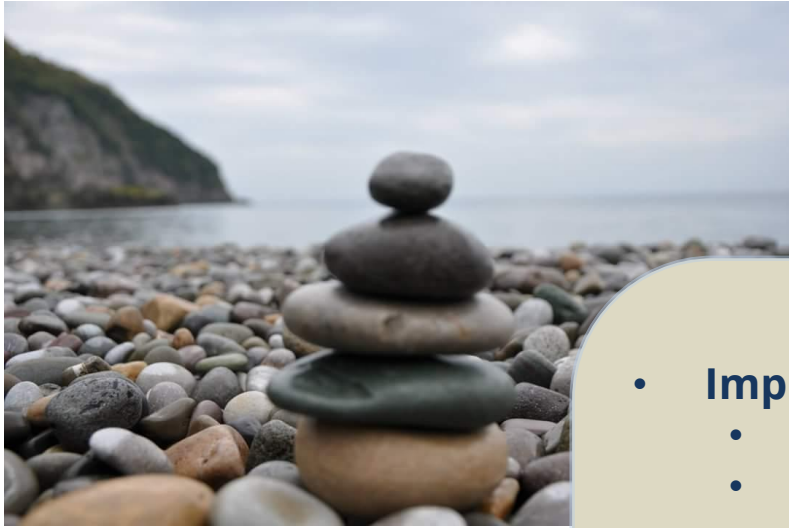
=> standardised methodology to avoid greenwashing

**Build on existing methodologies**, if possible

- start with what exists, e.g. safety: avoid *substances of concern*.
- add sustainability components when they are ready
- expand methods and models on
  - life-cycle assessment for chemicals,
  - (generate) environmental) monitoring data to validate models
  - ensure access to data/statistics on uses, volumes, chemical identity needed to fill the models
  - use standardised methods to fill data-gaps
- **Education and involvement of stakeholders**
  - educate and involve stakeholders along supply chains
  - educate on methodologies and interdisciplinary design processes



# How to foster a transition to Safe and Sustainable by Design food systems?



- **Implementable:**
  - develop fast, cost-efficient compliance methods
  - create a level playing field for European and imported products
  - Technical Support centres to assist businesses
- **Strong incentives needed for broad uptake of SSBD by industry**– sticks and carrots:
  - legal obligations, e.g. to include SSBD into risk assessment?
  - financial incentives – e.g. Financial taxonomy for investments, taxes, fees?
  - public and private procurement?





# Thanks to you for listening!

[xenia.trier@eea.europa.eu](mailto:xenia.trier@eea.europa.eu)



February 4<sup>th</sup> 2021: EEA web-briefing on  
Safe and Sustainable by Design (SSBD)

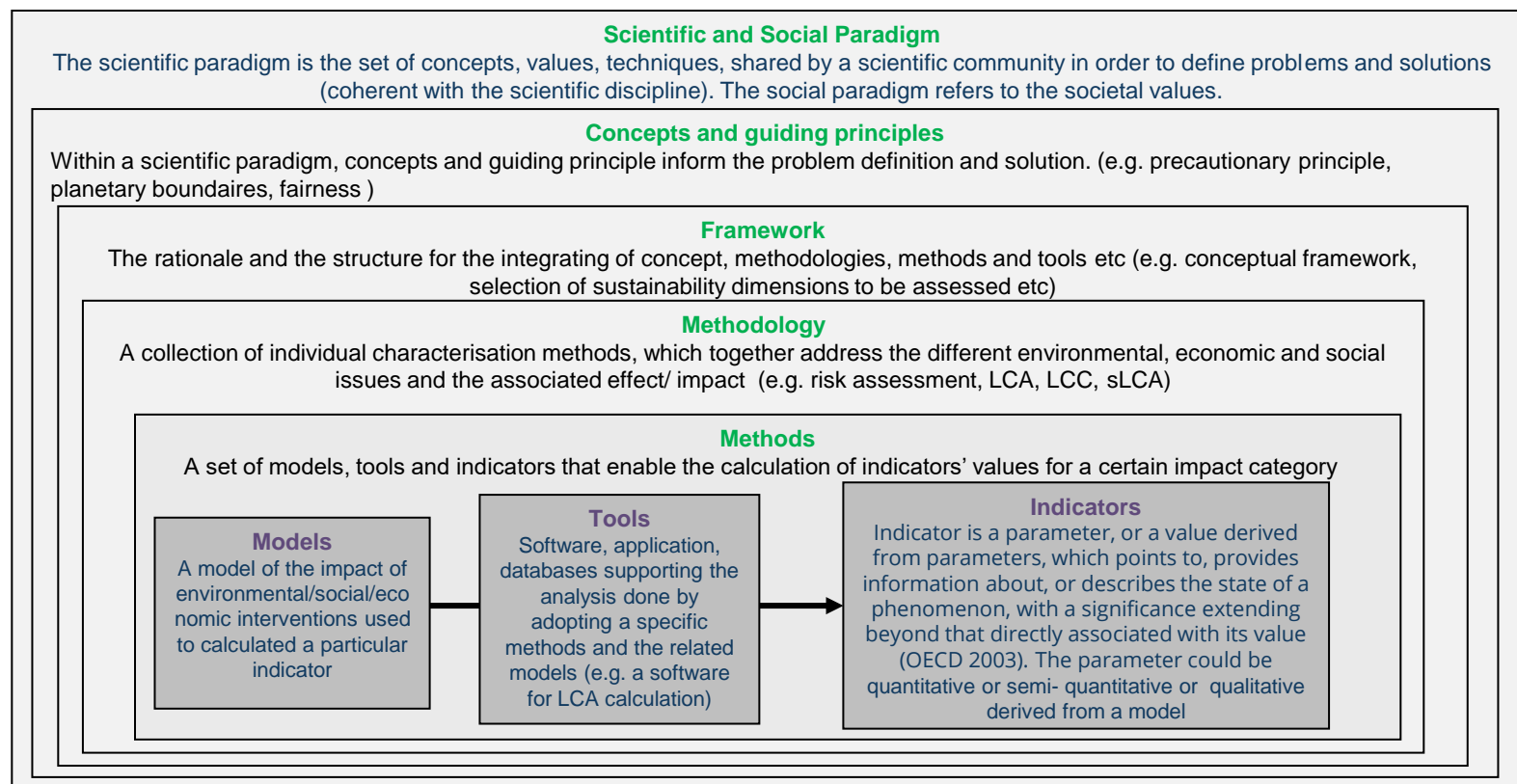


European Environment Agency





# What is a framework for sustainability assessment?



Modified from: Sala S., et al (2013) Progress in sustainability science: lessons learnt from current methodologies for sustainability assessment (Part I). International Journal of Life cycle Assessment 18:1653-1672

# Conclusions

- **Current regulation not sufficient to prevent harm now and in the future**
  - Due to increasing chemo-diversity, global consumption, emissions along lifecycles and climate change risks
- **New measures needed**
  - Focus on prevention in CSS
- **Strong incentives needed to guide innovation by industry**
  - Strong policy environment
  - Financial incentives: Favour markets for wanted products, and make it costly to pollute
- **How to achieve Safe and Sustainable by Design it in practice?**
  - Support and guide innovation and investments
  - Develop methods to assess impacts along lifecycles: need data/gap filling
  - Develop/standardise methods for assessment criteria
  - Establish Technical support centres
- **Education**
  - Interdisciplinary process
  - Education of academic, professional, supply chain, and demand side



# Why is existing legislation not enough?

- **Current legislations have not prevented pollution scandals**
  - Spills and irreversible pollution: Many communities affected and very costly for the public to clean up and manage
  - Regrettable substitutions: Bisphenols, BFRs, PFAS, chlorinated paraffins..
- **Why?**
  - Legislations based on scientific risk assessments which requires data, which often not available
    - No data ≠ No harm
    - Information on '*which chemicals, which hazards, which uses, which exposures*' depends on tonnage of chemicals
    - chemical standards not commercially available: prevents confirmatory monitoring and hazard characterization
    - Legislation mainly address chemicals used - not impurities, synthesis and reaction products of multi-materials
    - Mixtures
  - Environment already polluted by accumulated chemicals
  - Lack of incentives to prevent harm – financial, enforcement, legal, insurances?





# Why is existing legislation not enough?

- *new challenges*

- **Rapid growth in global production/ consumption of chemicals**
  - Total amount linked to risk:  $R = H \times E$
  - Diversity of chemicals: takes time to test
- **Circular economy**
  - Limited resources => Circular economy
  - Legislation not fit to assess future uses, across multiple material lifecycles
  - Limited capacity to monitor/track all substances through multiple cycles
  - Consequence: Transition to CE slowed if quality and cost of recycled materials is higher than virgin materials
- **Climate change**
  - frequency of storms, floodings, fires increase risks of accidents and remobilization of chemicals
  - Emerging pollution risks from fast upscaling of renewable energy technologies?

