Transformative research paving the way for digital product passports enabling actors' behavioral contributions to a non-toxic Circular Economy

Prof. Dr. Martin Führ
Dr. Julian Schenten | Dr. Silke Kleihauer / Rebecca Niebler | Maximilian Schweikert
Darmstadt University of Applied Sciences
Society for Institutional Analysis – sofia

2017/11/28
No. LIFE16 GIE/DE/000738

Overview

A. Nature of the problem:
"Substances of Concern" in everyday products

B. Normative orientation: guiding goals

C. Legal Framework today

D. Supply Chain Communication status quo

E. Closing the delta: Transformative research paving the way approach and examples

F. Outlook: Where the journey should lead…

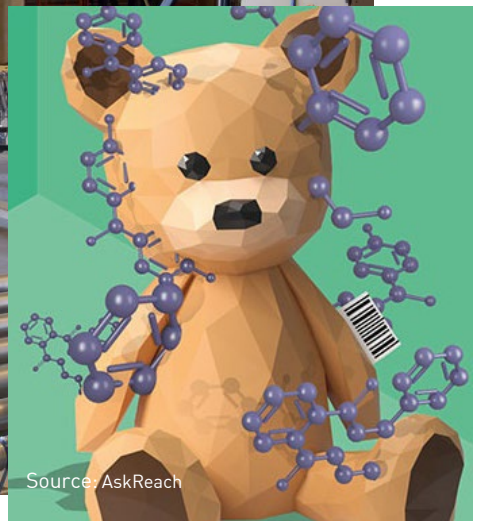
G. Leverage points
for digital product passports in a Non-Toxic Circular Economy

sofia

Prof. Dr. Martin Führ

Darmstadt University of Applied Sciences/Society for Institutional Analysis – sofia

A. Nature of the problem: Products as Core leverage point



Xenia Trier (EEA): „total toxic situation“ cocktail effects + permanent stress on human health and the whole variety of species + habitats

sofia

Prof. Dr. Martin Führ

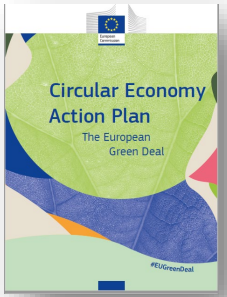
Darmstadt University of Applied Sciences/Society for Institutional Analysis – sofia

B.1 Normative Orientation: Guiding goals

United Nations: Sustainable Development Goals (SDGs)
SDG 12: **Ensure** sustainable consumption / production patterns (10YFP/12.4)

"Zero pollution" ambition cross-cutting: SDG´s/climate-neutrality + synergy with the clean and circular economy and biodiversity goals [COM 2021-400, 4]

European Commission: Green Deal [COM (2019)640, 8]
an electronic product passport could provide information on a product's origin, composition, repair and dismantling possibilities, and end of life handling.



COM(2020) 98 final, 4:
*"improving product **durability, reusability, upgradability and reparability**, addressing the presence of **hazardous chemicals** in products, and increasing their **energy and resource efficiency**"*

COM(2020) 667 final, 6:
"ensure availability of information on chemical content and safe use, by introducing information requirements"
*"**tracking** the presence of substances of concern through the life cycle of materials and products"*

sofia

Prof. Dr. Martin Führ

Darmstadt University of Applied Sciences/Society for Institutional Analysis – sofia

B.2 Guiding goals: Development on a global level…

UNEP GCO-II (2019): Key Finding 8

"Frontrunner companies – from chemical producers to retailers – are introducing
- sustainable supply chain management,
- **full material disclosure,**
- risk reduction **beyond compliance**, and
- human rights-based policies.

However, **widespread implementation** of these initiatives **has not yet been achieved**."

sofi

Prof. Dr. Martin Führ

Darmstadt University of Applied Sciences/Society for Institutional Analysis – sofia

C. Legal framework today: Innovation driving system?

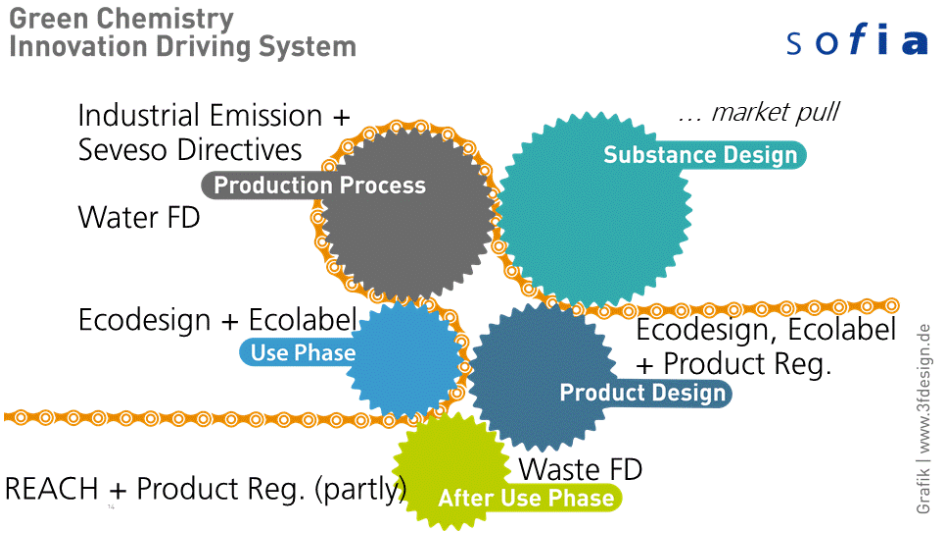
Originary Substance Law: REACH Regulation

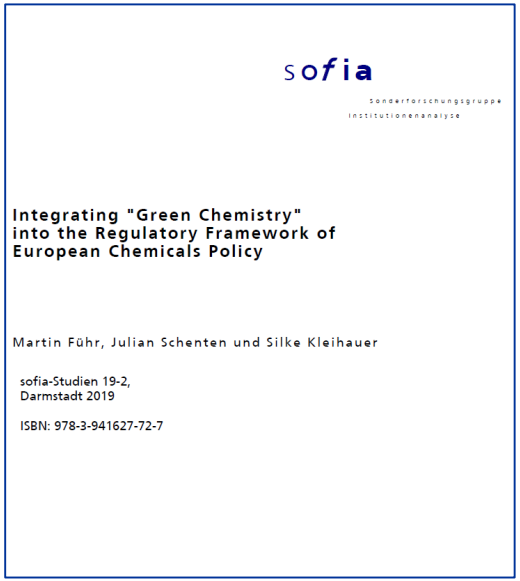
Directive 2010/75/EU on Industrial Emissions (IED)

Directive 2009/125/EC on Ecodesign

Directive 2008/98/EC on waste (Waste FD)

Directive 2000/60/EC framework water policy (Water FD)





sofia

Prof. Dr. Martin Führ

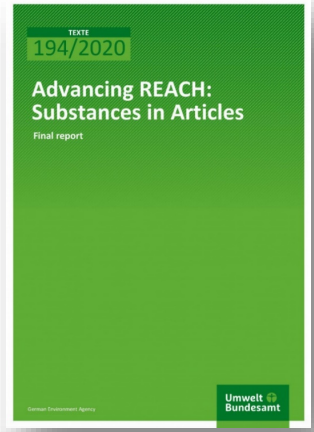
Darmstadt University of Applied Sciences/Society for Institutional Analysis – sofia

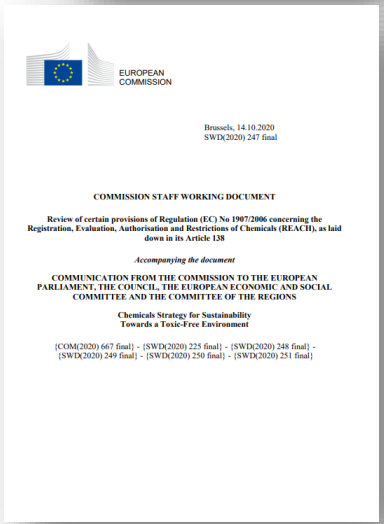
C. Legal Framework today

Originary Substance Law („rectify at source“): REACH burden of „proof“ shifted → concept of „self-responsibility“ of industry in order to tackle „toxic ignorance“
('The dose alone makes the poison', *Paracelsus*)

- **Substances and Mixtures: Registration Regime**
  - Data requirements + data transparency (ECHA database) indirectly support “benign by design” *(in theory)*
  - Entire life cycle of a substance (*in theory), h*owever
    - **EoL** not really covered in registrations
    - **Sourcing** not included at all

    → Risk management (reactive) rather than (proactive) risk prevention
- **Substances in Articles:**
  Authorisation Regime + Supply chain information
  - Focus on SVHC: Substitution of problematic substances
  - Art 33: Legal uncertainties + 100% enforcement deficit




EUROPEAN COMMISSION

Brussels, 14.10.2020
SWD(2020) 247 final

COMMISSION STAFF WORKING DOCUMENT

Review of certain provisions of Regulation (EC) No 1907/2006 concerning the Registration, Evaluation, Authorisation and Restrictions of Chemicals (REACH), as laid down in its Article 138

Accompanying the document

COMMUNICATION FROM THE COMMISSION TO THE EUROPEAN PARLIAMENT, THE COUNCIL, THE EUROPEAN ECONOMIC AND SOCIAL COMMITTEE AND THE COMMITTEE OF THE REGIONS

Chemicals Strategy for Sustainability
Towards a Toxic-Free Environment

{COM(2020) 667 final} - {SWD(2020) 225 final} - {SWD(2020) 248 final} - {SWD(2020) 249 final} - {SWD(2020) 250 final} - {SWD(2020) 251 final}

sofia

Prof. Dr. Martin Führ

Darmstadt University of Applied Sciences/Society for Institutional Analysis – sofia

D. Supply Chain Communication status quo

- Restricted Substance List (RSL) and Manufacturing Restricted Substance Lists (MRSL) most common practice
  → Suppliers provide general statements of conformity against the (M)RSL rather than information on actual substances

Problems:

- **Data quality and reliability:** information provided in compliance declarations is too scarce to check even plausibility *(lack of trust)*
- **Conformity declarations** refer to the substances listed on (M)RSL/SVHC list by this date *(lack of future proofness)*
- **Request overload:** In addition to sector standards, companies tend to create their own (M)RSLs, thus contributing to the proliferation of multiple and inconsistent requests to suppliers

sofia

Prof. Dr. Martin Führ

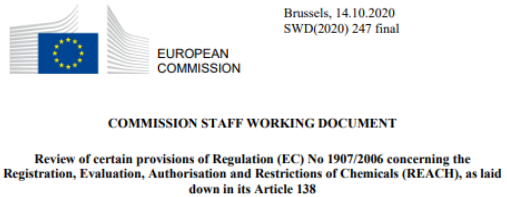
Darmstadt University of Applied Sciences/Society for Institutional Analysis – sofia

D. Shortcommings („real live delta“)

Supply chain actors: not in a position to „detox“ their products (toxic ignorance)

- **Law in the books:** information requirements → ”duty to organise“ (Art. 36 REACH)
- **Obstacles in practice:** Low cost sourcing → complex & volatile supply chains
- **Brands/Retailers:** placing products on the market of unknown composition

→ **Greener Chemistry: Lack of market pull**
for less problematic substances/mixtures


EUROPEAN COMMISSION

Brussels, 14.10.2020
SWD(2020) 247 final

COMMISSION STAFF WORKING DOCUMENT

Review of certain provisions of Regulation (EC) No 1907/2006 concerning the Registration, Evaluation, Authorisation and Restrictions of Chemicals (REACH), as laid down in its Article 138

The reports and reviews summarised in the previous section can help explain why there **has been little improvement in the implementation** [of Article 33 REACH] during the last decade. These include

- lack of awareness of duty holders,
- absence of adequate information management systems in certain companies,
- technical difficulties derived from the complexity of articles and their chemical content and
- scarce information on imported articles. (p. 34)

sofia

Prof. Dr. Martin Führ

Darmstadt University of Applied Sciences/Society for Institutional Analysis – sofia

E.0 Closing the delta: Transformative research paving the way

Information gathering, **C**ommunication & **C**ooperation **(IC&C)** of all actors along the value chain

Transformative research: conceptualize the necessary steps

- starting point: **problem analysis**
- a **scenario process** involving the relevant stakeholders
- combined with a **backcasting approach** (strategy workshop)
- provides the for developing a roadmap

… to close the motivational gaps and overcome the organisational impediments

sofia

Prof. Dr. Martin Führ

Darmstadt University of Applied Sciences/Society for Institutional Analysis – sofia

E.1 Transformative Research Approach

Problem impulse → Mobilise improvement potential

1. **A**nalyse
   sectors with improvement capacity
2. **I**dentify
   a) the relevant actors and
   b) the incentives/ impediments
   which influence their behaviour
3. **M**odify
   the institutional framework(s)
   - macro level (legal requirements)
   - meso-level (sectoral cooperation → trust)
   - micro-level (organisational set-up
     contractual obligations)

Institutional analysis
based on the stepwise heuristic
of motivational factors:
homo oeconomicus institutionalis

sofia

Prof. Dr. Martin Führ

Darmstadt University of Applied Sciences/Society for Institutional Analysis – sofia

E.2 Joint efforts towards a common understanding: **Theory of Change (ToC)** or „Modes of Change“(MoC)

Why Theory of Change/Modes of Change“ (ToC/MoC**)?**

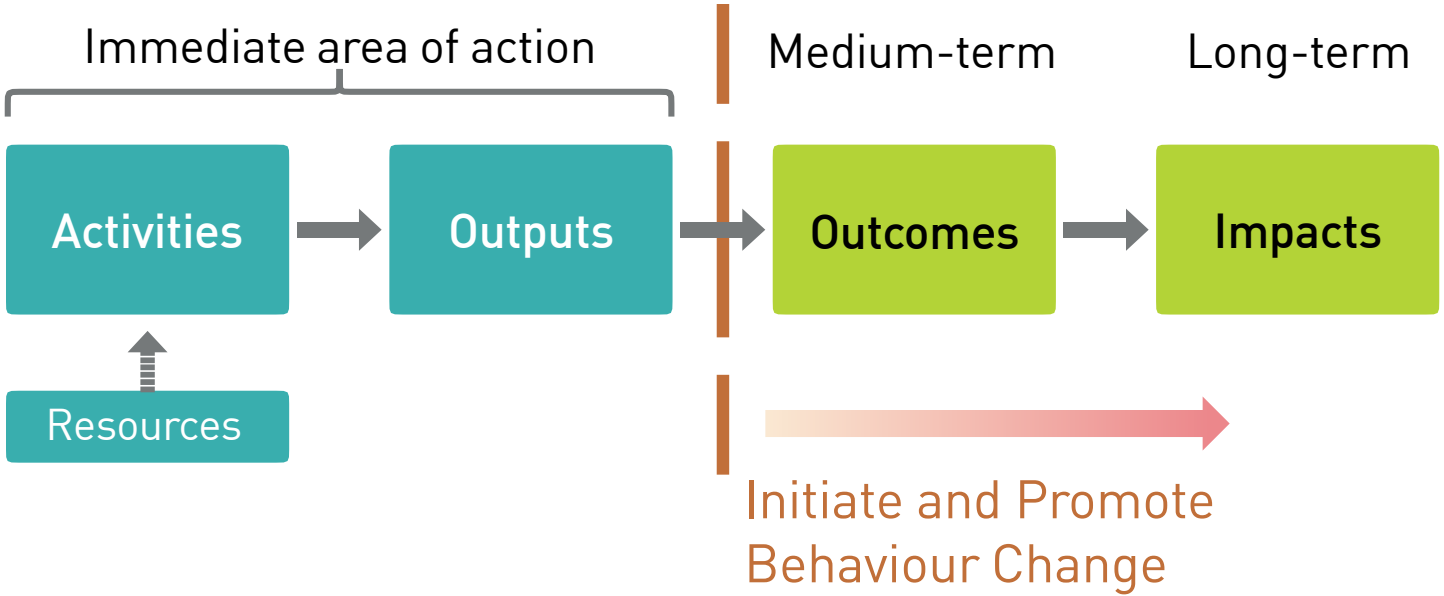
- Idea of how actors specifically interact to yield a desired change
- Identify key influencing factors within complex systems and their interactions
- Actors approach the topic with different experiences, professional backgrounds, thinking styles and resulting perceptions
- ToC/MoC-process: relevant actors directly involved
- Plurality of perspectives: clearer picture of the sequence of measures

sofia

Prof. Dr. Martin Führ

Darmstadt University of Applied Sciences/Society for Institutional Analysis – sofia

E.3 The Theory of Change (ToC)



see Grantcraft (2006). Mapping Change: Using a Theory of Change To Guide Planning and Evaluation. S.8.

sofia

Prof. Dr. Martin Führ

Darmstadt University of Applied Sciences/Society for Institutional Analysis – sofia

E.4.1 Experiences from transformative research: SusChem project (German Federal Environmental Foundation)

Scenario-process (cross-impact analysis)

~~Muddling through~~

Boldly ahead!

LIFE • ASK REACH

Supply chain action +
Consumer app:
Scan4Chem

Backcasting
Strategy workshop

Proactive Alliance: Policy Paper
„towards a global material reporting standard“,
incl. **full material declaration (FMD)**

proactive alliance
towards a global material reporting standard

Discussion Paper
with Technical Recommendations

sofia

Prof. Dr. Martin Führ

Darmstadt University of Applied Sciences/Society for Institutional Analysis – sofia

E.4.2 Experiences from transformative research

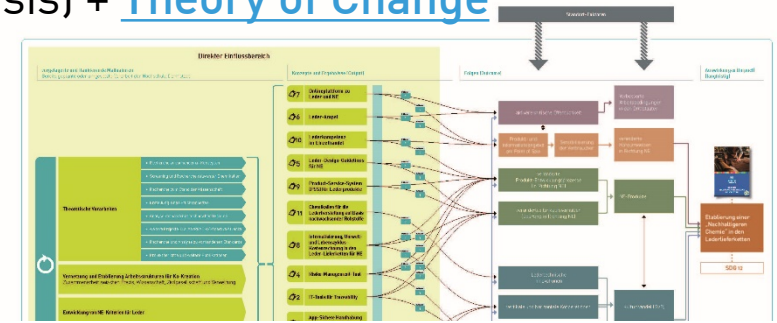
s:ne - More sustainable chemistry in the leather supply chains

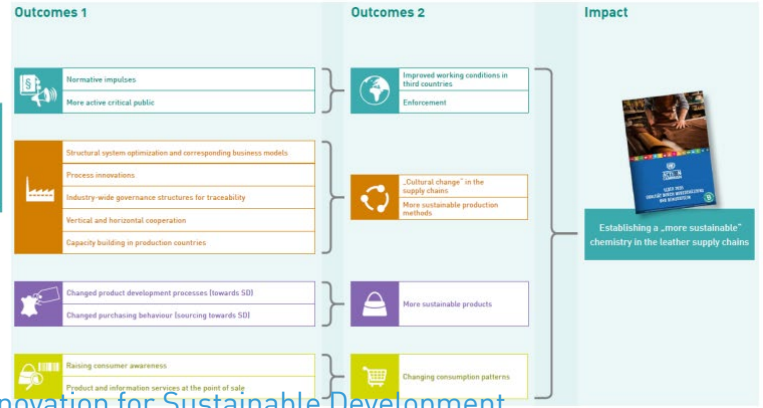
Scenario-process (cross-impact analysis) + [Theory of Change]

h_da HOCHSCHULE DARMSTADT UNIVERSITY OF APPLIED SCIENCES
s:ne SYSTEMINNOVATION FÜR NACHHALTIGE ENTWICKLUNG

IMPLEMENTATION PROJECT | CITIZENS' PANEL

You are here: | Implementation project | More sustainable chemistry in the leather supply chains





Backcasting
Strategy workshop
translated to ToC

source: Darmstadt University of Applied Sciences, Systeminnovation for Sustainable Development

Funded by the Federal Ministry of Education and Research - BMBF and the State of Hesse.

https://naturwissenschaften.ch/co-producing-knowledge-explained/practical_experiences/theory_of_change

sofia

Prof. Dr. Martin Führ

Darmstadt University of Applied Sciences/Society for Institutional Analysis – sofia

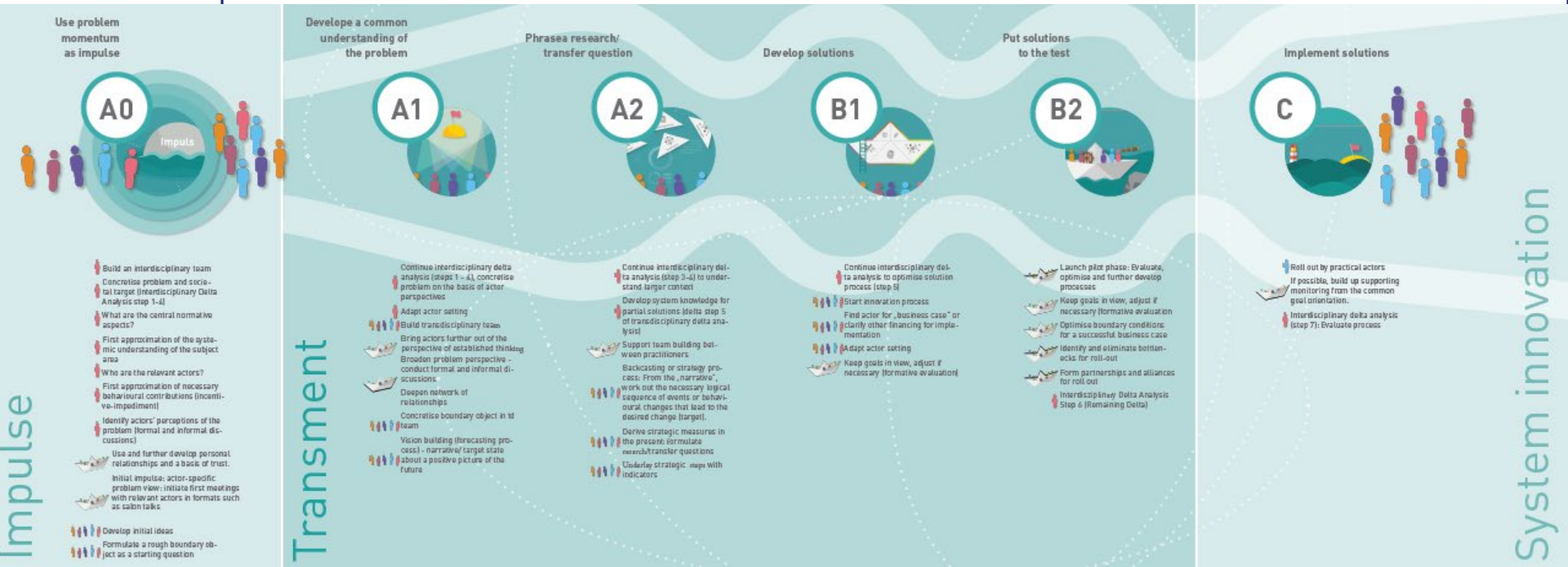
E.4.3 Transments: Transformative Experiments towards Systeminnovations (s:ne)

A0 Impuls: problem momentum

A1/A2 problem framing: common understanding → transfer question

B1/B2 solutions: develop solutions jointly → test the solutions

C „real live“: stakeholder implemen the solutions



F. Outlook: Where the journey should lead ...

FMD: Every supplier provides full material declaration dataset (with jokers for **justified** confidential business information, CBI)

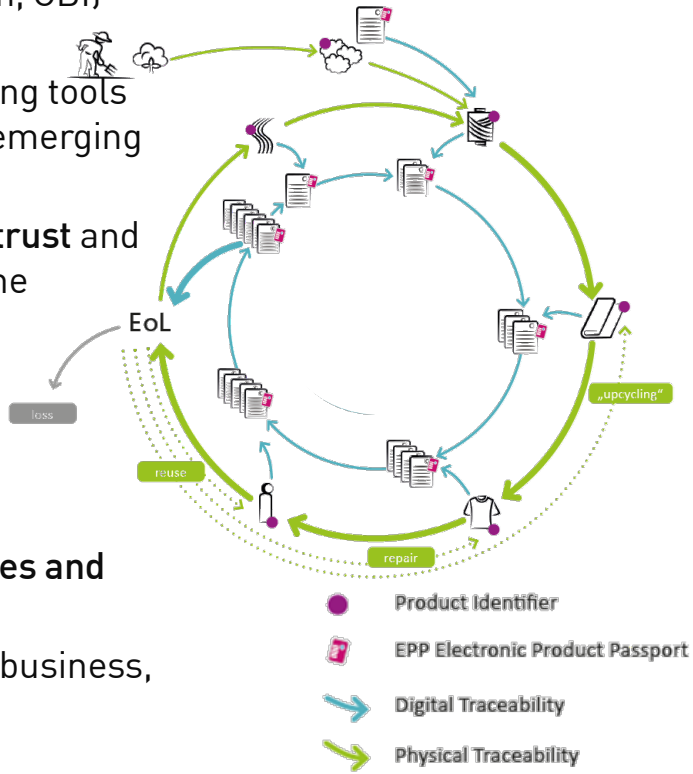
Data Hub provides an open-source information system that interoperates with CE-related datasets, CE-supporting tools from different service providers (incl. maintenance) and emerging digital platforms to collect relevant **EPP**-data.

Governance mechanisms provide the necessary **level of trust** and create a secure framework for interactions and ensure the accuracy and reliability of information.

Unique product identifiers (UPI), i.a. through new types of material identifiers in combination with adapted tracking and sorting systems, enable actors to **clearly assign information to a product.**

Use the flow of information to enable **value-added services and business models**.

→ Necessary: Transfer of ideas and knowledge between business, research and other relevant actors.



sofia

Prof. Dr. Martin Führ

Darmstadt University of Applied Sciences/Society for Institutional Analysis – sofia

G. Leverage points: electronic/digital product passports in a Non-Toxic Circular Economy

1. Additional **legal incentives at "macro-level"** are necessary to stimulate
   - Design for "**durability, reusability, upgradability and reparability**" (NCEAP) ...
     - extension of the service life
     - joint usage concepts
   - based on **materials without "problematic substances"** [SoC → CSS]
   - allowing at EoL reprocessing into **high quality secondary raw material**
2. Additional **measures at "meso-level"** are necessary to **address impediments**
   - Supply networks and sectoral/cross-sectoral cooperation, e.g. ...
   - Standardization of data structure and exchange format
   - ...
3. Companies (**"micro-level"**): Strategy and operational measures
   - "duty to organize": install material data systems
   - Involve the other actors of the suppy chain

sofia

Prof. Dr. Martin Führ

Darmstadt University of Applied Sciences/Society for Institutional Analysis – sofia

More information / references:

Julian Schenten, Martin Führ, Silke Kleihauer, Joana Schönborn
Traceability as driver for more sustainable chemistry in the global textile supply chains,
in: Current Opinion in Green and Sustainable Chemistry (Elsevier), 2019 (19), 87-93
https://doi.org/10.1016/j.cogsc.2019.08.003

Kleihauer, Silke, Martin Führ und Julian Schenten
Marktchancen für "nachhaltigere Chemie" durch die REACH-Verordnung - Am Beispiel globaler Lieferketten in der Textil- und Sportartikel-Industrie
sofia-Studien zur Institutionenanalyse 19-1, Darmstadt 2019
ISBN: 978-3-941627-69-7

EU-LIFE AskREACH project

SuSport project scenario process
- scenario story „boldly ahead“ (english)
- SuSport-Video (english)

s:ne project: More sustainable chemistry in the leather supply chains

td-toolbox: A Theory of Change (ToC)
supporting the visioning of a sustainable supply chain

sofia

Prof. Dr. Martin Führ

Darmstadt University of Applied Sciences/Society for Institutional Analysis – sofia

Thanks for your attention!

www.sofia-research.com/

Martin Führ
Darmstadt University of Applied Sciences/
Society for Institutional Analysis – sofia