7th Green and Sustainable Chemistry Conference
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Dresden Germany

Traceability of chemicals in products:
Key enabler for a non-toxic, resource-saving and climate-neutral circular economy

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Overview

0. All chemicals are equal?
A. Background and aim
B. Method and participants
C. Results of the workshop
D. Reflection on the methodology
E. Open questions

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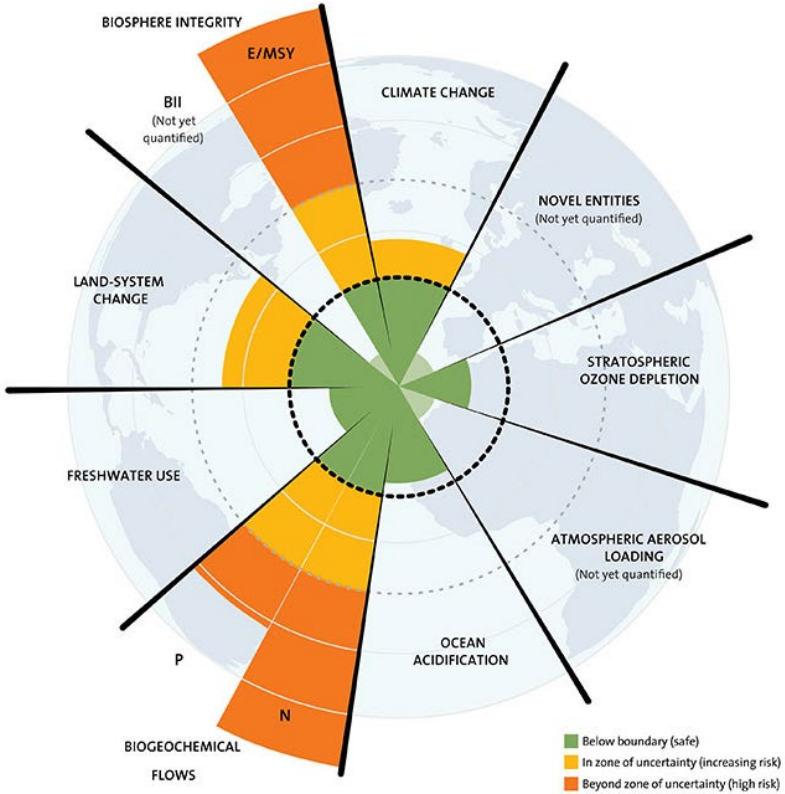
0. Planetary Boundaries & Chemicals ?



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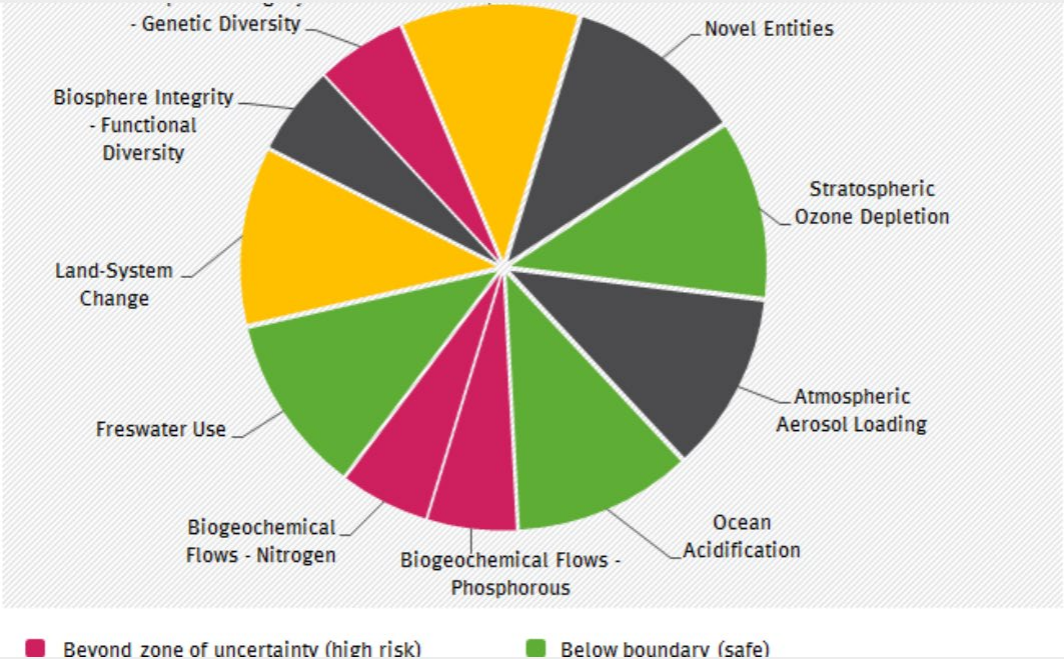

Planetary boundaries

Source: Umweltbundesamt

https://www.umweltbundesamt.de/en/topics/chemicals/chemicals-management/sustainable-chemistry-0#sustainability-in-dealing-with-chemicals 23.05.2023

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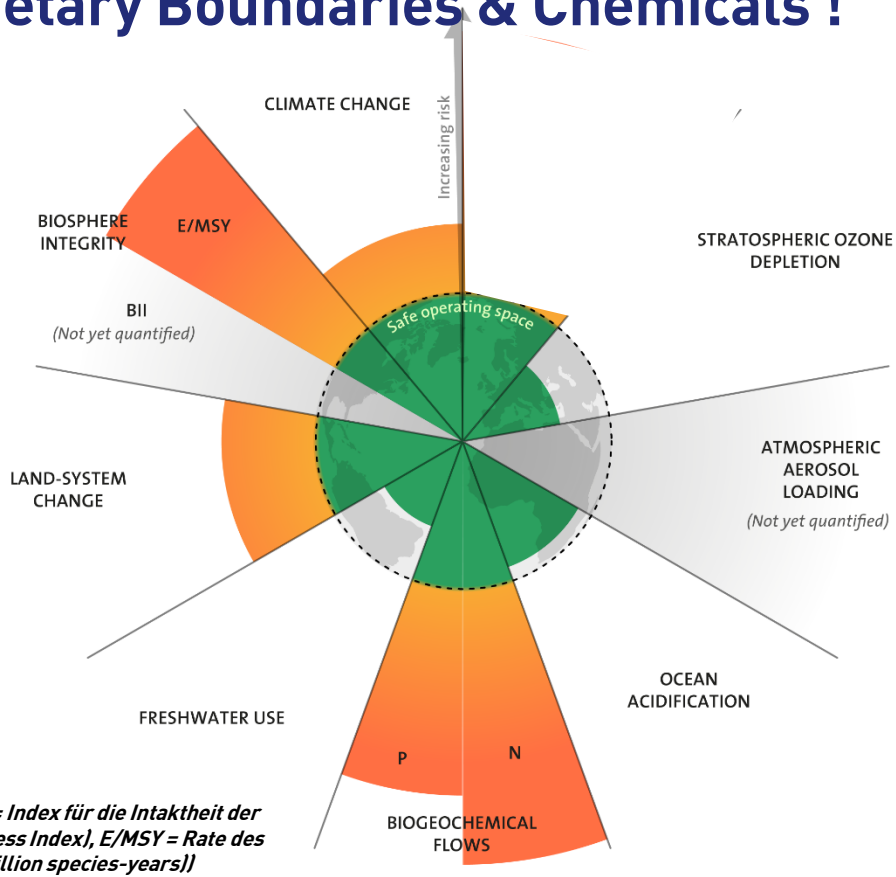
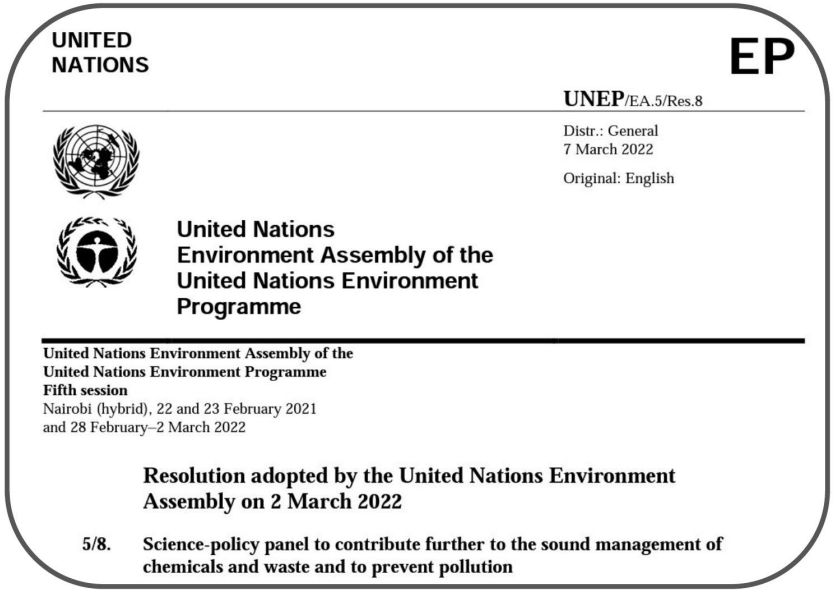


(P = Phosphor, N = Stickstoff, BII = Index für die Intaktheit der Biodiversität (BiodiversityIntactness Index), E/MSY = Rate des Artensterbens (extinctions per million species-years))

(Stockholm Resilience Centre 2022)

0. Planetary Boundaries & Chemicals !!

Chemicals & Waste, the new Paradigm #3



UNITED NATIONS

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United Nations Environment Assembly of the United Nations Environment Programme

United Nations Environment Assembly of the United Nations Environment Programme
Fifth session
Nairobi (hybrid), 22 and 23 February 2021
and 28 February–2 March 2022

Resolution adopted by the United Nations Environment Assembly on 2 March 2022

5/8. Science-policy panel to contribute further to the sound management of chemicals and waste and to prevent pollution

Chemicals & Waste impacts on our planet
are considered at a similar level as Climate Change

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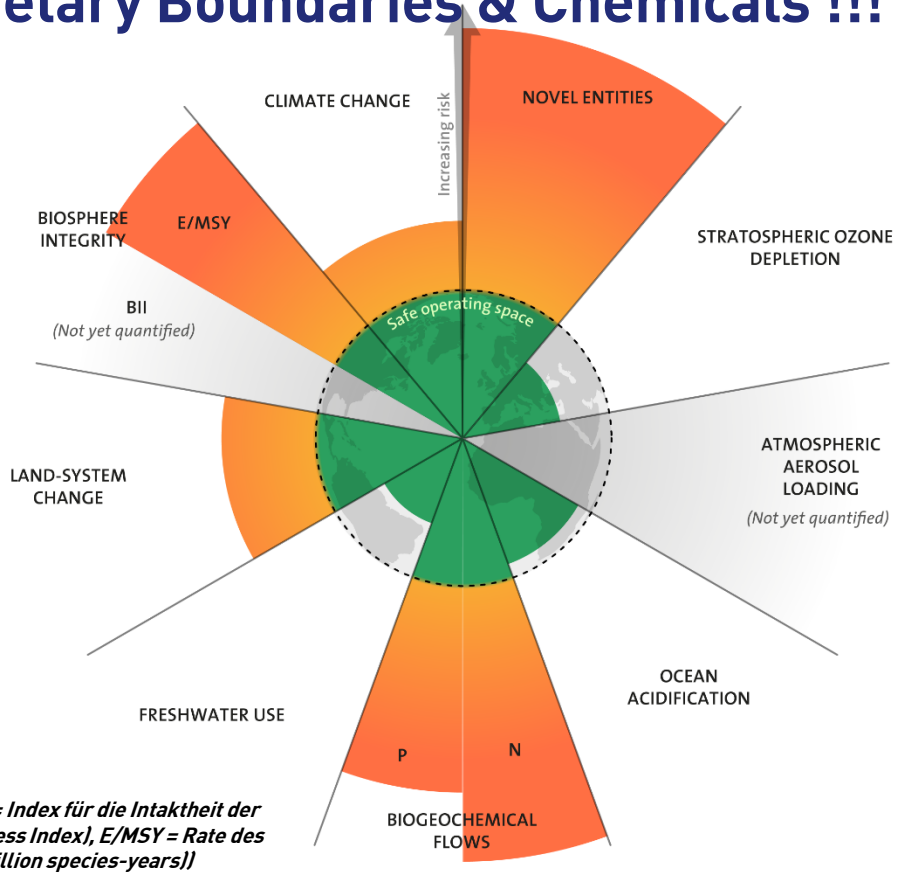
0. Planetary Boundaries & Chemicals !!!



In terms of SDG 12:
We have to
- decarbonise
- detox
material streams

In both respect traceability is a key enabler (also for material stewardship)

(P = Phosphor, N = Stickstoff, BII = Index für die Intaktheit der Biodiversität (BiodiversityIntactness Index), E/MSY = Rate des Artensterbens (extinctions per million species-years))

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A.1 Background: European Green Deal → non-toxic, resource-efficient climate neutral Circular Economy

The EU Green Deal formulates a strategy that aims to transform the EU into "*modern, resource-efficient and competitive economy where there are no net emissions of greenhouse gases in 2050*" (COM(2019) 640, p. 2). It outlines the transition towards a resource efficient "*clean and circular economy*" (ibid, p. 7) that is capable of avoiding risk cycles of (legacy) substances of concern, enhancing management and control of chemical substances in materials and articles. **Policies implementing the Green Deal** (e.g. CEAP, CSS, SPI) directly or indirectly touch upon the **issue of traceability**. They are developed in parallel to each other, and it is challenging to anticipate the impact **and interplay** across the policy fields. Thus, **a thorough systemic understanding** how the building blocks may work together in creating the required traceability of chemicals seems key.

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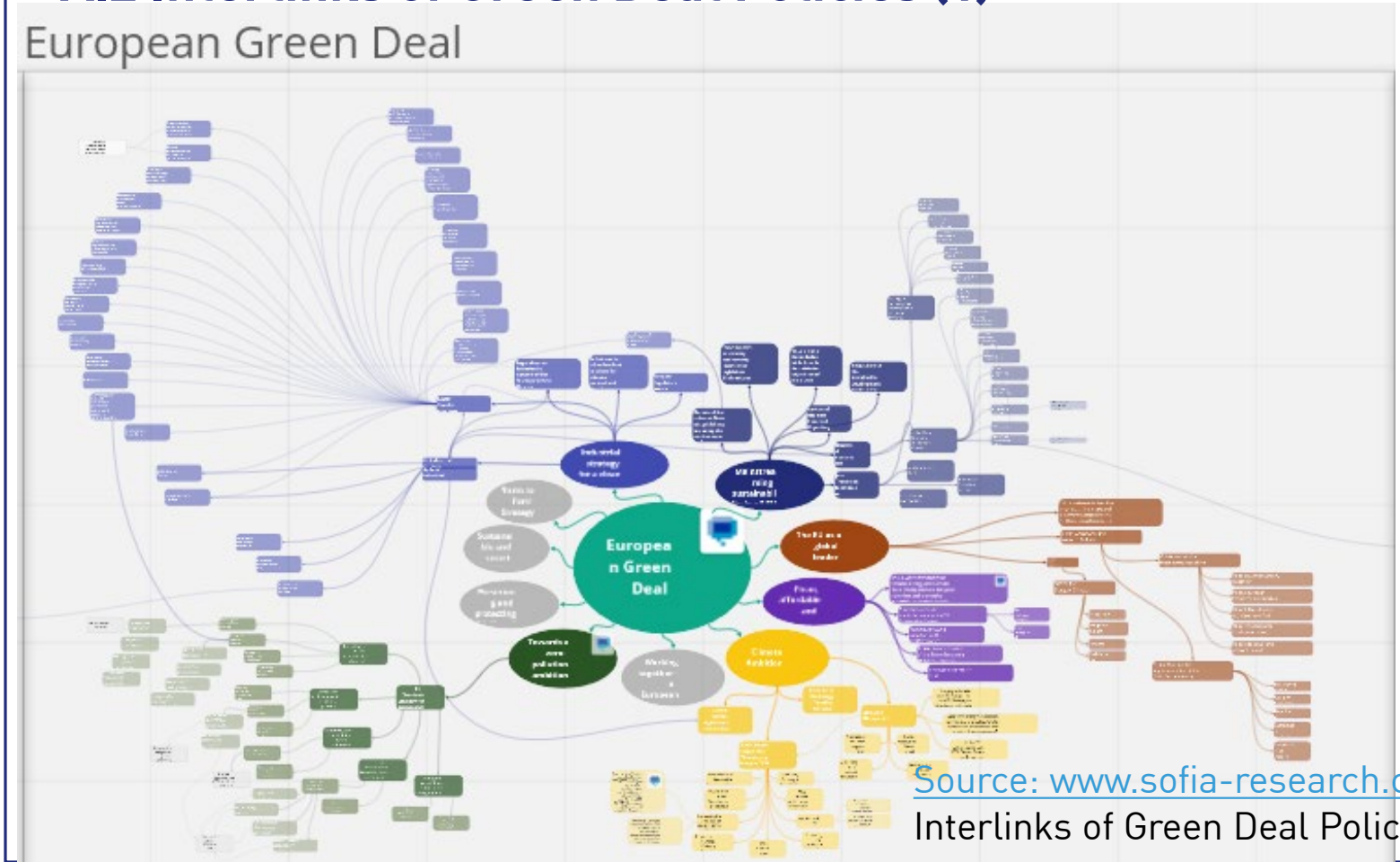
A.2 Interlinks of Green Deal Policies (1)



Source: www.sofia-research.com

Interlinks of Green Deal Policies

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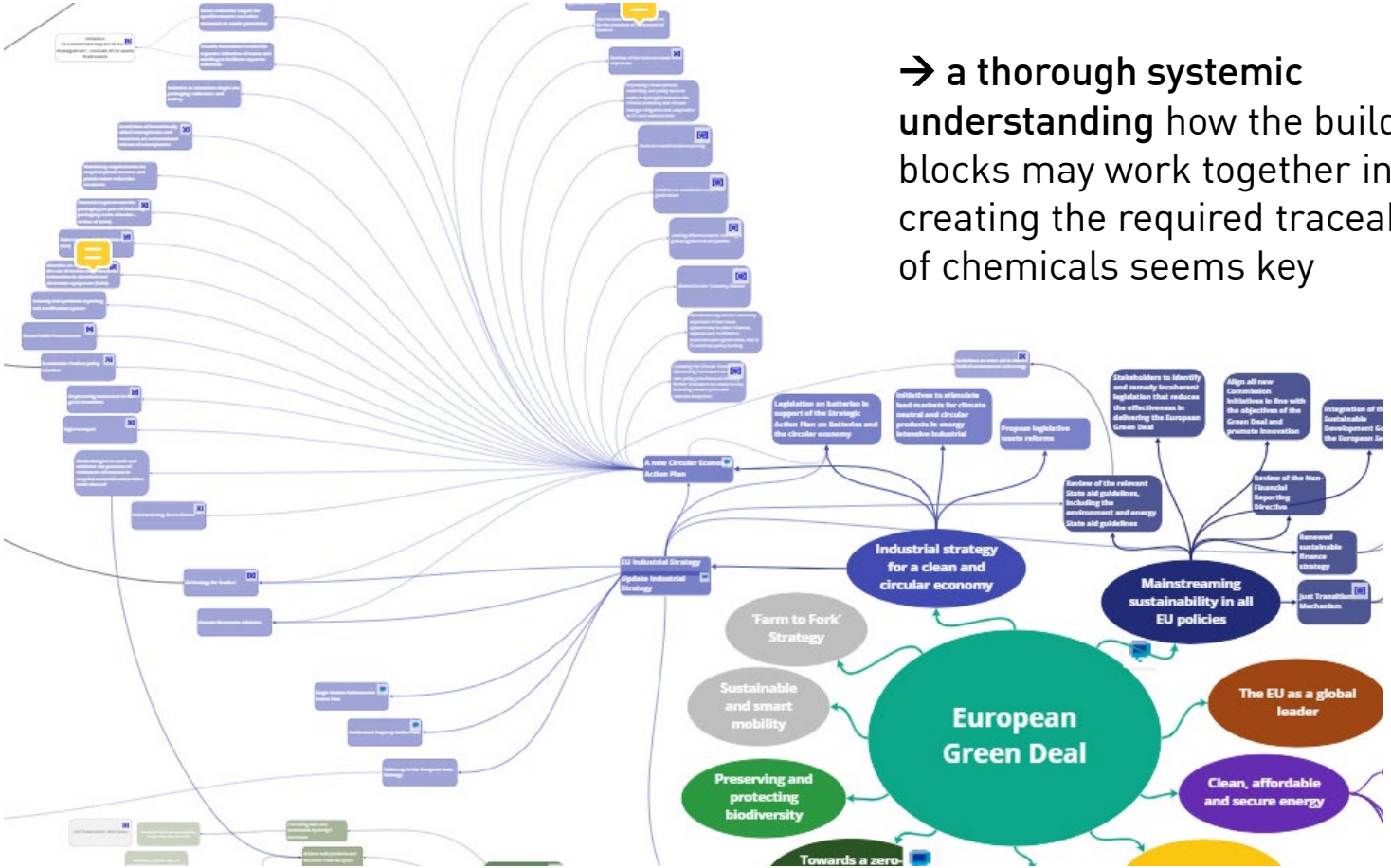
A.2 Interlinks of Green Deal Policies (2)



→ **a thorough systemic understanding** how the building blocks may work together in creating the required traceability of chemicals seems key

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A.3 Aim of the workshop

Create a **clearer picture** of how the **Green Deal policy instruments** can contribute to a **non-toxic, resource-preserving and climate neutral** Circular Economy and

in particular the **role of traceability of chemicals as enabler** in this respect.

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B.1 Method: Three-Step Process

During the two day workshop (31.5.-1.6.2022, Brussels) the participants

(1) agreed on a **common vision** for „Traceability of Chemicals in 2035“.

(2) identified **policy instruments linked to the Green Deal** and selected those they considered **most relevant** in terms of reaching the vision. For each instrument the participants provided a definition as well as a short description of the instruments‘ roles on the 2035 vision.

(3) Cross-impact-analysis:
How the selected **instruments influence each other**.

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B.2 Methodological framework

It was not possible to complete the analysis during the workshop in Brussels. The participants therefore completed the analysis as a „home assignment". On 17 June, the group met again virtually and discussed the results.

Methodically, the process combines elements of

- *Scenario building* and
- *Theory of Change*

in an adapted, focussed application on policies assessment.

As a preparatory measure sofia and BEF co-hosted two online sessions (11 and 12 November 2021) as part of the *ISC3 Global Sustainable Chemistry Week.*

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B.3 Participating stakeholder groups

Decision-makers and experts from

- EU industry and trade associations (raw materials, technology, furniture, foreign trade)
- Market leader brands (textiles and furniture)
- European Commission services
- Member States competent authorities (Austria, France, Germany, Luxembourg and Sweden)
- NGOs (waste and environment)
- Transfer and applied research organisations.

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C.1 Results: Common Vision for Traceability

"In 2035:
Established EU trustful, proportionate and efficient traceability schemes for chemicals
- to enable circular value chains* of articles ending up in final products,
- to the benefit of supply chains actors, end-users and authorities
- towards non-toxic, resource-efficient and climate neutral Circular Economy."

* circular value chains: "production supply chains", repair/maintenance services, and EoL-actors

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C.2 Results: Seletion of instruments (1)

Instrument means *legislation and other policies, or elements thereof (e.g. specific tools, concepts, principles, mechanisms) that are already in place, drafted, planned*

or even not yet officially planned but reasonable to assume (= missing instruments)

Activities: Brainstorming, clustering, prioritisation

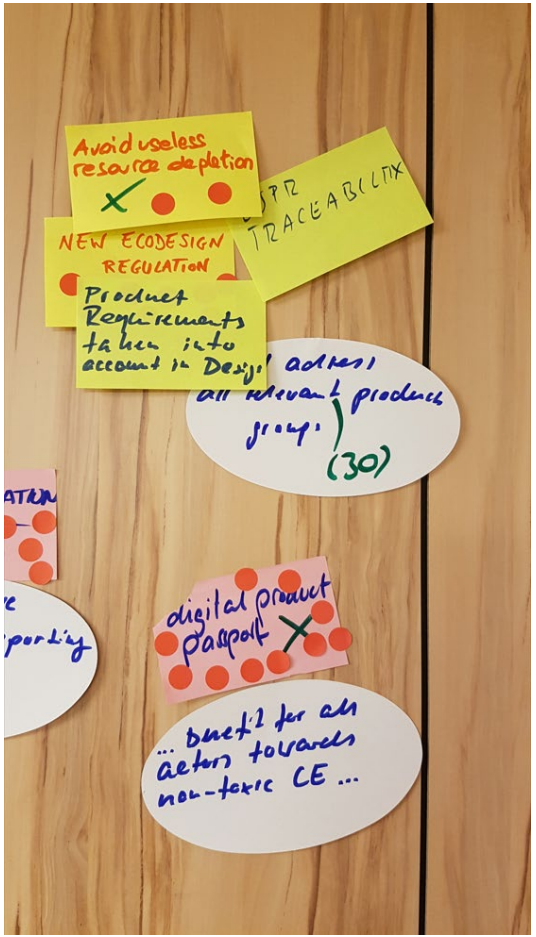

Figure 1: Documentation of some selected instruments

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C.2 Results: Seletion of instruments (2)

Instrument definition	Role in 2035 vision (Green Deal legislation implemented)
Enhanced Data Sheet (legal instrument) for substances and mixtures	Provides information on (almost) all substances, i.e. full ingredient lists.
Ecodesign for Sustainable Products Regulation (ESPR) product requirements	Delegated acts for the most relevant (30) product groups are in place. The requirements guide the design phase.
Phase-out of the most hazardous substances (via restrictions based on generic risk approach)	The sunset dates will have passed. Most companies are aware of the restrictions and of market chances related to compliance. Meanwhile new SoC will emerge calling for continuous improvement.
SCIP database	It will fulfil its originally foreseen tasks (inform EoL-actors/consumers/authorities) and cover more SoC besides SVHCs
Capacity building (policy)	The competences in the sectors will have been built up (for the most part) and sector-specific support is readily available
Sector harmonised approaches / Standardization (CEAP: "harmonised tracking systems")	Sectors have established specific reporting approaches (based on common formats/rationales to allow for cross-sector reporting, see Proactive Alliance)
Digital Product Passport	Provides the information required to the benefits of value chains actors, end-users and authorities towards a non-toxic, resource-efficient and climate neutral Circular Economy.

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C.3 Cross-impact analysis (1)

2035 Established EU trustful, proportionate and efficient traceability schemes for chemicals to enable circular value chains of articles ending up in final products, to the benefit of supply chains actors, end-users and authorities towards a non-toxic, resource-efficient and climate neutral Circular Economy.

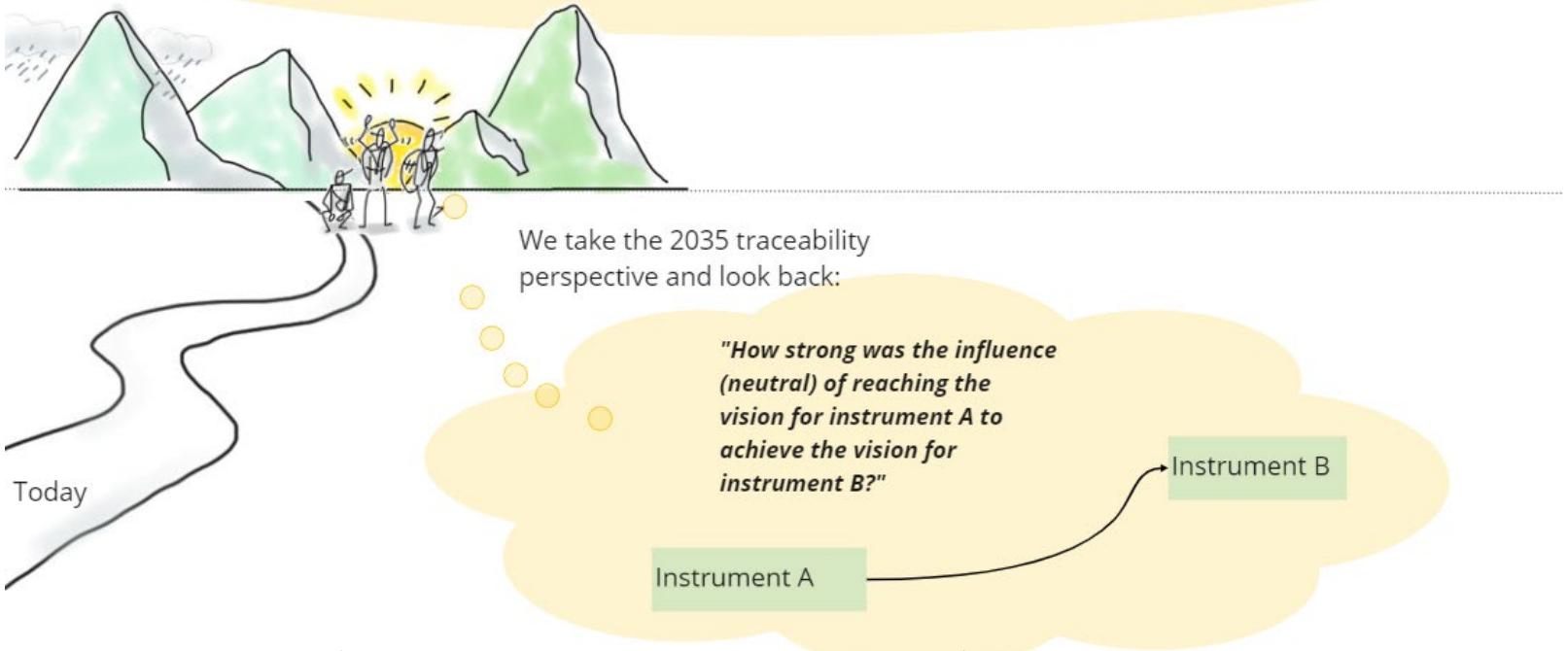

Figure 3: Perspective of evaluation (source of picture: https://www.pinterest.de/pin/127156389453818434/)

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C.3 Results: Cross-impact analysis (2)

An **impact matrix** to structure the discussion and to show the impact of one instrument in a row on the other instruments listed in the columns.

The impact is described in four **qualitative** gradations:
- **no** influence at all (0),
- **weak** influence (1),
- **moderate** influence (2) and
- **strong** influence (3)

Two values in case of no consent
→ two scenarios for the impact matrix

		1	2	3	4	5	6	7		
		Instrument A	Instrument B	Instrument C	Instrument D	Instrument E	Instrument F	Instrument G	Row sum	**Impact direction** (Row sums / Column sums)
1	Instrument A	x								
2	Instrument B		x							
3	Instrument C			x						
4	Instrument D				x					
5	Instrument E					x				
6	Instrument F						x			
7	Instrument G							x		
	Column sum									

Figure 3: Cross-impact matrix

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C.3 Results: Cross-impact analysis (3)

1st "higher influence" Scenario

		1	2	3	4	5	6	7		
		Enhanced Data Sheet	ESPR product requirements	Phase-out of the most haz subs	SCIP	Capacity building (policy)	Sector harmonization	Digital Product Passport	Row sum	**Impact direction** (Row sums / Column sums)
1	Enhanced Data Sheet	x	2	3	2	2	1	2	12	1,33
2	ESPR product requirements	0	x	2	3	1	3	3	12	1,09
3	Phase-out of the most hazardous substances	0	2	x	2	1	1	1	7	0,54
4	SCIP	2	2	2	x	2	2	3	13	0,81
5	Capacity building (policy)	2	2	2	3	x	2	2	13	1,30
6	Sector harmonized approaches / Standardization	2	2	2	3	2	x	3	14	1,17
7	Digital Product Passport	3	1	2	3	2	3	x	14	1,00
	Column sum	9	11	13	16	10	12	14		

Figure 4: Impact Matrix Scenario 1

2nd "lower influence" Scenario

		1	2	3	4	5	6	7		
		Enhanced Data Sheet	ESPR product requirements	Phase-out of the most haz subs	SCIP	Capacity building (policy)	Sector harmonization	Digital Product Passport	Row sum	**Impact direction** (Row sums / Column sums)
1	Enhanced Data Sheet	x	2	3	1	0	1	2	9	1,13
2	ESPR product requirements	0	x	2	2	1	3	3	11	1,10
3	Phase-out of the most hazardous substances	0	1	x	2	1	1	1	6	0,50
4	SCIP	2	2	1	x	2	2	3	12	0,92
5	Capacity building (policy)	2	2	2	3	x	2	2	13	2,17
6	Sector harmonized approaches / Standardization	2	2	2	3	1	x	3	13	1,18
7	Digital Product Passport	2	1	2	2	1	2	x	10	0,71
	Column sum	8	10	12	13	6	11	14		

Figure 5: Impact Matrix Scenario 2

Dividing for each instrument
the $\frac{\text{row sums}}{\text{column sums}}$ (indicator for the influence of the instrument on the all others) by the column sums (indicator for how the instrument is influenced by all other instruments) shows the impact direction of instruments:

Higher value = instrument is a driver for the "Traceability 2035" vision
Lower value = instrument is driven by others

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C.3 Results: Cross-impact analysis (3)

1st "higher influence" Scenario

		1 Enhanced Data Sheet	2 ESPR product requirements	3 Phase-out of the most haz subs	4 SCIP	5 Capacity building (policy)	6 Sector harmonization	7 Digital Product Passport	Row sum	**Impact direction** (Row sums / Column sums)
1	Enhanced Data Sheet	x	2	3	2	2	1	2	12	1,33
2	ESPR product requirements	0	x	2	3	1	3	3	12	1,09
3	Phase-out of the most hazardous substances	0	2	x	2	1	1	1	7	0,54
4	SCIP	2	2	2	x	2	2	3	13	0,81
5	Capacity building (policy)	2	2	2	3	x	2	2	13	1,30
6	Sector harmonized approaches / Standardization	2	2	2	3	2	x	3	14	1,17
7	Digital Product Passport	3	1	2	3	2	3	x	14	1,00
	Column sum	9	11	13	16	10	12	14		

Figure 4: Impact Matrix Scenario 1

2nd "lower influence" Scenario

		1 Enhanced Data Sheet	2 ESPR product requirements	3 Phase-out of the most haz subs	4 SCIP	5 Capacity building (policy)	6 Sector harmonization	7 Digital Product Passport	Row sum	**Impact direction** (Row sums / Column sums)
1	Enhanced Data Sheet	x	2	3	1	0	1	2	9	1,13
2	ESPR product requirements	0	x	2	2	1	3	3	11	1,10
3	Phase-out of the most hazardous substances	0	1	x	2	1	1	1	6	0,50
4	SCIP	2	2	1	x	2	2	3	12	0,92
5	Capacity building (policy)	2	2	2	3	x	2	2	13	2,17
6	Sector harmonized approaches / Standardization	2	2	2	3	1	x	3	13	1,18
7	Digital Product Passport	2	1	2	2	1	2	x	10	0,71
	Column sum	8	10	12	13	6	11	14		

Figure 5: Impact Matrix Scenario 2

Capacity building policies and **sector harmonised approaches** (towards traceability) as strongest drivers; **Enhanced data sheet** scores comparatively high

Digital Product Passport not seen as driver but rather to be driven by other developments

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C.3 Results: Conclusions

- All organisations participating agree that **traceability of chemicals is a key enabler** for the circular economy
- Impact matrix indicates which instruments should be prioritized to contribute to the 2035 vision
- Deliberations revealed possible steps that some actors relevant to the transformation need to take
  - It is for the legislators and industry to set frameworks that assure the information flow throughout the entire circular value chains
  - and that in each step information is collected and provided targeted to specific needs of the respective actors, ranging from downstream businesses over consumers to authorities.

→ Insights are **relevant for policy-makers and industry** when assessing strategies and related measures and instruments.

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D.1 Reflection on the methodology

Aim of the workshop:

Create a **clearer picture** of how the **Green Deal policy instruments** can contribute to a non-toxic, resource-preserving and climate neutral Circular Economy and in particular the **role of traceability of chemicals as enabler** in this respect.

- **Scenario setting** stimulates open minded interaction based on
  - an "**alienation effect**" *(Bertold Brecht)* in combination with
  - a **„homo ludens" approach** creating a distance
- to the traditional professional perceptual grids and reaction patterns
- **Reproducibility:** Additionally a market leader brand (not participating at the workshop) used same method producing **very similar results**

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D.2 Reflection on the methodology (2)

Two quotes from participants:

"This workshop provided a **good platform to get better to know the positions of all stakeholders** and to discuss them with each other. Therefore, something like this should **become a certain normality regarding the elaboration of an issue** at an early stage in order to know the different perspectives of the different participants/stakeholders."

"The methodology was **demanding but creative**. Can be used more! Just to **define each important and foreseeable tool, as of 2035, is a good practice**.
What do we want and what is needed to go there."

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E Open Questions

Further clarification needed (legislation and/or standards) in view of the aim

Providing data
- Which actor has to **generate** which data and
- to **transfer**
  - which of the data
  - to whom? – considering justified confidentiality claims

Receiving data
- Who has access to which level of data details and
- to which extent are the data available
  - for authorities and
  - the public at large?

Digital Product Passport
- needs a **proper institutional framework**, including
  - tailor made legislation recognising the interfaces between different regulations and directives
  - sectoral and cross-sectoral standardisation efforts as well as
  - innovations on company level and the contractual basis of their interaction.

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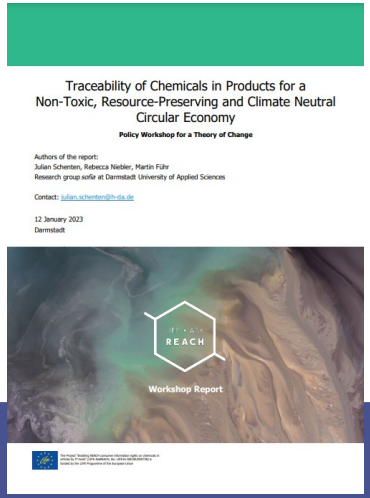

Thanks for your attention!

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