Für Mensch & Umwelt

Umwelt Bundesamt

An overview of appropriate indicators of waste aspects for measuring sustainability in international chemicals management

Henning Friege, Christopher Blum, Esther Heidbüchel, Barbara Zeschmar-Lahl

7th Green and Sustainable Chemistry Conference – GREN 2023
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Anchoring sustainable chemistry in chemicals management: Developing milestones and indicators for international chemicals management after 2020 – UBA research project 3719 65 404 0

- **Henning Friege - N³ Thinking Ahead Dr. Friege & Partners**
- **Christopher Blum - Umweltbundesamt**
- **Esther Heidbüchel – CSCP**
- **Barbara Zeschmar-Lahl - BZL GmbH**

NACHHALTIGKEITSBERATUNG
DR. FRIEGE & PARTNER

Umwelt Bundesamt

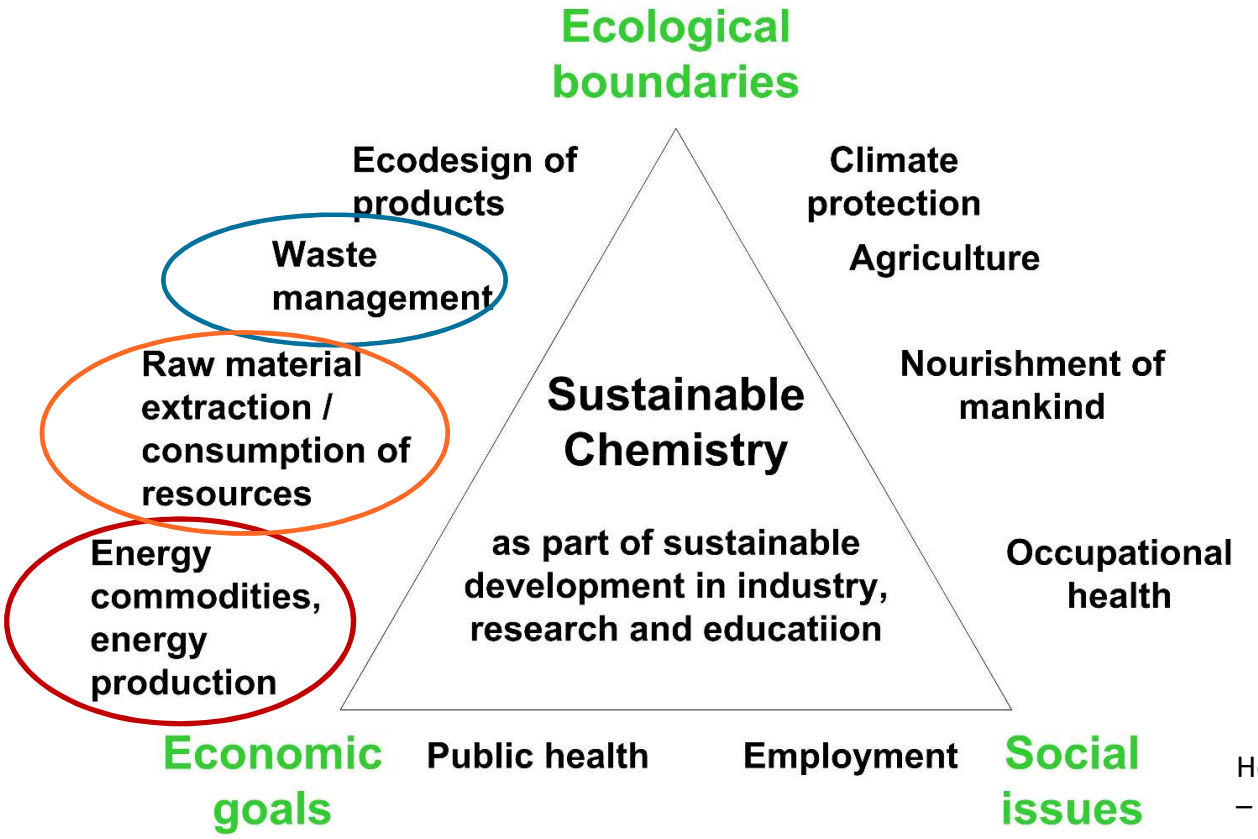
cscp

BZL Kommunikation und Projektsteuerung GmbH

OUTLINE

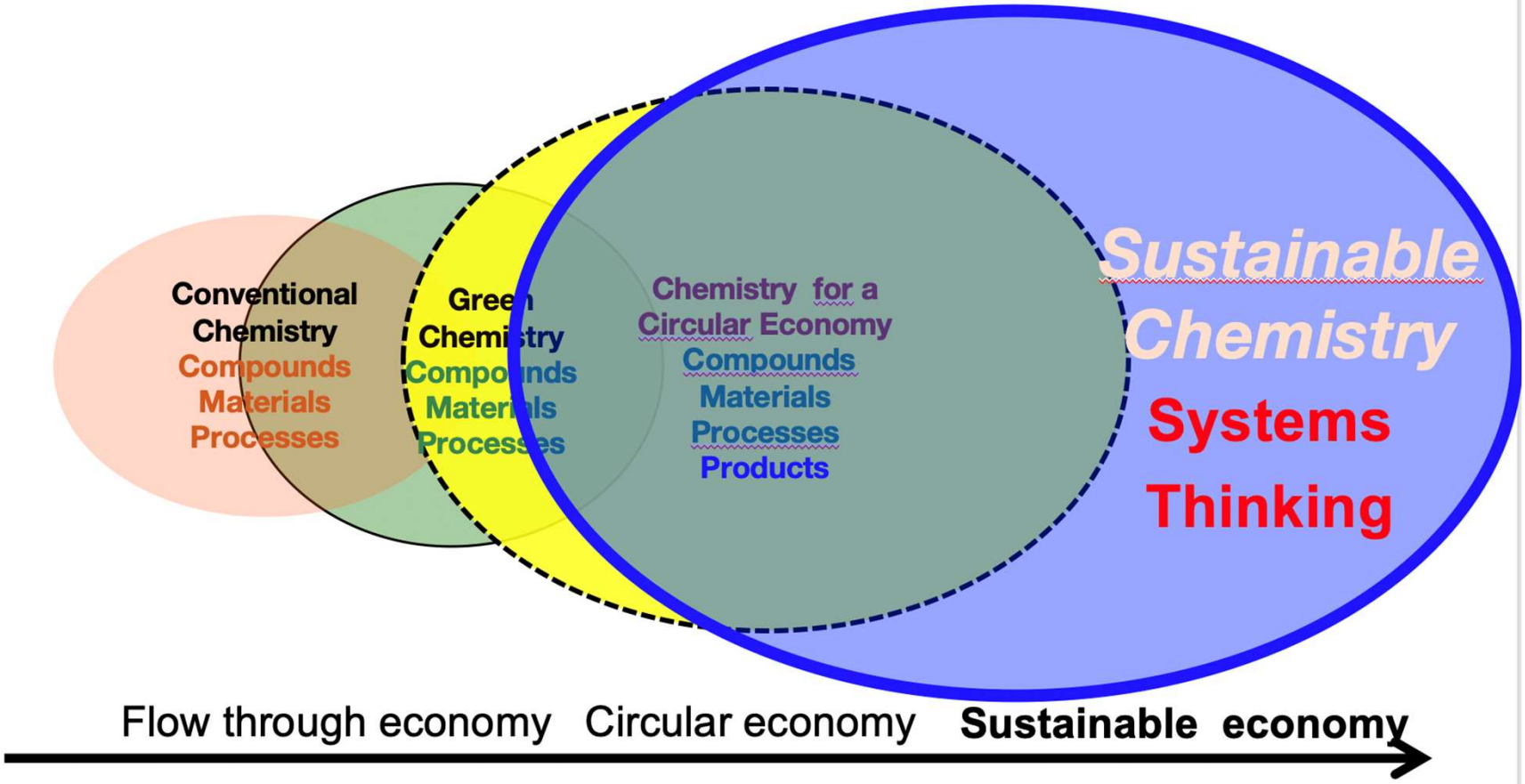
- SUSTAINABLE CHEMISTRY: THE BIG PICTURE
- SAICM: RELEVANCE OF WASTE
- WASTE-RELATED TARGETS
- INDICATORS RELATED TO WASTE AND RESOURCES IN GENERAL
- INDICATORS RELATED TO HAZARDOUS WASTE
- CURRENT DISCUSSION

Sustainable Chemistry – the big picture



Henning Friege, Sustainable Chemistry – A concept with important links to waste management. Sustain. Chem. & Pharm. **6** (2017) 57-60

Sustainable Chemistry – the big picture (Source: Klaus Kümmerer, Leuphana University and ISC3)



SAICM: Relevance of waste in the Dubai Declaration (2006)

DUBAI DECLARATION:

- **We are unwavering in our commitment to promoting the sound management of chemicals and hazardous wastes throughout their lifecycle, in accordance with agenda 21 … (no. 11)**
- **We are committed to strengthening the capacities of all concerned to achieve the sound management of chemicals and hazardous wastes at all levels (no. 15)**
- **We will endeavour to prevent illegal traffic in toxic, hazardous, banned and severely restricted chemicals and chemical products and wastes (no. 25)**

DUBAI OVERARCHING POLICY STRATEGY:

Risk reduction: the objectives of the strategic approach with regard to risk reduction are…

- **to reduce the generation of hazardous waste, both in quantity and toxicity, and to ensure the environmentally sound management of hazardous waste, including its storage, treatment and disposal;**
- **to promote the environmentally sound recovery and recycling of hazardous materials and waste;**

ILLEGAL INTERNATIONAL TRAFFIC:

The objectives of the strategic approach with regard to illegal international traffic are…

- **to prevent illegal international traffic in toxic, hazardous, banned and severely restricted chemicals, including products incorporating these chemicals, mixtures and compounds and wastes**

SAICM: Relevance of waste in the targets under discussion (as proposed by the Co-Chairs)

- **A1** – **By 2030, governments** have adopted, implemented and enforce legal frameworks and established appropriate institutional capacities to prevent or where not feasible, **minimize adverse effects from chemicals and waste**.
- **A 4** – By 20xx, **illegal international trade and traffic** of toxic, hazardous, banned and severely restricted chemicals and **of waste** is effectively prevented.
- **D 3** – [countries]**[governments] implement policies that** encourage production using sustainable and safe(r) alternatives including cleaner production technologies and **facilitate re-use and recycling of products (circular economy)**
- **D6** – **By 20xx, sustainable chemical and waste management strategies have been developed and implemented** for xy major economic sectors with intense chemical use … to reduce chemical input and footprint along the value chains (**e.g. textile, electronic, building, agriculture etc.**)

Interfaces with Sustainable Chemistry

- Climate
- Finance
- Health
- Biodiversity
- Resources, Circular Economy
- Energy
- Decent Work
- Gender Equality
- Infrastructure
- XX

D 3 – [Countries][governments] implement policies that… facilitate re-use and recycling of products (circular economy)

Indicator:

Material footprint, material footprint per capita, and per GDP (SDG indicator 12.2.1)

Domestic material consumption, domestic material consumption per capita and per GDP (SDG indicator 12.2.2)

Link to sustainable chemistry: Resource management

Link to the SDGs: Target 12.2 – By 2030, achieve the sustainable management and efficient use of natural resources

Custodian (for monitoring etc.)

- UNEP
- National Governments
- Companies
- Associations
- ESS

Interfaces with Sustainable Chemistry

D 3 – [Countries][governments] implement policies that… facilitate re-use and recycling of products

Custodian (for monitoring etc.)

Indicator	General Criteria		Sustainability Criteria	
Material footprint, material footprint per capita, and per GDP.*	A	Specific	H1	Precautionary principle
	B	Established	H2	Systems thinking
	C	Determinable	H3	Social responsibility
	D	Measurable	H4	Transparency & collaboration
	E	Reliable & transparent	H5	Resource management
	F	Dynamic		
	G	Pertinent		

*SDG Ind. 12.2.1

XX

Interfaces with Sustainable Chemistry

- Climate
- Finance
- Health
- Biodiversity
- Resources, Circular Economy
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- Gender Equality
- Infrastructure
- Waste management

A 4: By 20xx, illegal international trade and traffic of… waste is effectively prevented.
D 3 – [Countries]… facilitate re-use and recycling of products (circular economy)

<u>Indicator:</u>
Amount of post-consumer plastic waste generated / recycled / incinerated / landfilled / not collected per country.
(Proposed by participants of Workshop No 2)

Link to sustainable chemistry:
Systems thinking, resource management
Link to SDG Target 12.6: By 2030, substantially reduce waste generation through prevention, reduction, recycling and reuse.

Custodian (for monitoring etc.)

International Agencies, UN suborganisations

National Governments

Companies

Associations

EUROSTAT

Interfaces with Sustainable Chemistry

Custodian (for monitoring etc.)

Indicator	General Criteria		Sustainability Criteria	
Amount of post-consumer plastic waste generated / recycled / incinerated / landfilled / not collected per country.	A	Specific	H1	Precautionary principle
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Waste management

Interfaces with Sustainable Chemistry

- Climate
- Finance
- Health
- Biodiversity
- Resources, Circular Economy
- Energy
- Decent Work
- Gender Equality
- Infrastructure
- Waste

D 3 – [Countries][governments] implement policies that …facilitate re-use and recycling of products (circular economy)
D 6 – By 20xx, sustainable chemical and waste management strategies have been developed and implemented… to reduce chemical input and footprint along the value chains (e.g. textile, electronic, building, agriculture etc.)

<u>Indicator:</u>
Amount of household waste generated / recycled (type…) / incinerated / landfilled per country

Proposed by SAICM TWG4 (similar: IPEN indicator D.2-15)

Custodian (for monitoring etc.)

World Bank, UNEP: GWMO (spotlights…)

National Governments

Companies

Associations

Others

Interfaces with Sustainable Chemistry

D 3 – [Countries][governments] implement policies that …facilitate re-use and recycling of products (circular economy)
D 6 – By 20xx, sustainable chemical and waste management

Custodian (for monitoring etc.)

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Gender
Infrastructure
Waste

Indicator	General Criteria		Sustainability Criteria	
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*TWG4 (similar: IPEN Ind. D.2-15)

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Interfaces with Sustainable Chemistry

- Climate
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- Resources, Circular Economy
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- Infrastructure
- Waste

A1 – …prevent or where not feasible, minimize adverse effects from chemicals and waste
D 3 – … facilitate re-use and recycling of products (circular economy)

<u>Indicator:</u>

Proportion of hazardous waste treated, by type of treatment e.g. recovered, recycled, incinerated

Second part of SDG Indicator 12.4.2 plus type of waste management

Link to Basel Convention

(Definition of hazardous waste should be taken from the Basel Convention)

Custodian (for monitoring etc.)

Basel Convention Hubs

National Governments

Companies

Associations

Others

Interfaces with

A1 – …prevent or where not feasible, minimize adverse effects from chemicals and waste

Custodian (for monitoring

Indicator		General Criteria			Sustainability Criteria	
Proportion of hazardous waste treated, by type of treatment (12.4.2) e.g. recovered, recycled, incinerated.*	A	Specific		H1	Precautionary principle	
	B	Established		H2	Systems thinking	
	C	Determinable		H3	Social responsibility	
	D	Measurable		H4	Transparency & collaboration	
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*SDG Ind. 12.4.2 Basel Conv.

Waste

Interfaces with Sustainable Chemistry

- Climate
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- Infrastructure
- Waste

A 4 – By 20xx, illegal international trade and traffic of toxic, hazardous, banned and severely restricted chemicals and of waste is effectively prevented.

<u>Indicator:</u>
Total value of inward and outward illicit financial flows (in current US-$)… related to chemical products and waste
First part: SDG indicator 16.4.1 related to ICCS categories (slavery, drug and firearm trafficking…) ; additional text: suggestion by the project team

It should be stressed over and over again that there is still not enough data available to get a clear picture of illicit international waste flows. (World Customs Organisation)

Custodian (for monitoring etc.)

Basel Convention, OECD, WCO, UN suborgan.

National Governments

Companies

Associations

NGO`s

Interfaces with Sustainable Chemistry

A 4 – By 20xx, illegal international trade and traffic of toxic, hazardous, banned and severely restricted

Custodian (for monitoring etc.)

Indicator	General Criteria		Sustainability Criteria	
Total value of inward and outward illicit financial flows related to chemical products and waste (in current US-$).*	A	Specific	H1	Precautionary principle
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*SDG Ind. 16.4.1

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Conclusion

- **We suggest a number of indicators for waste and resources which represent important interfaces with sustainable chemistry.**
- **These indicators are mostly linked to SDG statistics, reports to the Basel Convention etc., but are often not specific enough to measure progress towards sustainable chemistry.**
- **European statistics provide many data that can be used to measure progress towards sound management of chemicals and waste and sustainable chemistry.**
- **Therefore, we also checked the list of indicators for potential use to monitor the European Chemicals Strategy for Sustainability (EU CSS).**
- **The reliability of waste management data should [illegible] European level.**

Join us for breakfast in Brussels on June 1, 9:30: Indicators useful for the Chemicals Strategy for Sustainability

Thank you for your attention

NACHHALTIGKEITSBERATUNG
DR. FRIEGE & PARTNER

www.N-hoch-drei.de
info@N-hoch-drei.de