Substitution of Hazardous Chemicals: Lessons, Opportunities and Challenges from a Civil Society Organization’s Perspective

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Substitution as an established international principle

• Under REACH for Substances of Very High Concern (and contribution to overarching EU objective for a ‘non-toxic environment’)
• Under regional seas conventions (esp. OSPAR, HELCOM, Barcelona)
• As a mechanism under the Stockholm Convention on POPs
• As a risk reduction objective ("Support for environmentally sound and safer alternatives") under the UN Strategic Approach to International Chemicals Management (SAICM)...
  • clean production as a general approach
  • informed substitution of chemicals of particular concern
  • consideration of non-chemical alternatives in substitution decisions
Trade

Rotterdam Convention
38 chemicals

Stockholm Convention
13 chemicals

Production, Trade, Use,
Waste & Disposal

When they are banned or become waste

Basel Convention

Waste & Disposal

Minamata Convention
Hg
Substitution: key aspects from an NGO perspective

• Transparency
• Open collaboration between stakeholders
• Hazard-based identification of substances requiring substitution
• Using a ‘red flag’ basis rather than score averaging
  • Compared to, e.g. ZDHC Framework for the Prioritisation of Hazardous Chemicals
  • Risk based: Chemicals prioritized using volume, and use pattern, as well as hazard
  • ‘score averaging’: A chemical with a high priority can have low priority (if volume & use pattern are low priority)

• Consideration of non-chemical alternatives (material and functional substitution)
  • Eg replacing brominated flame retardants and PVC in electronics using more inherent fire resistant materials (such as aluminum and specialized polymers) or eliminating the need for wires through product redesign www.subsportplus.eu/case-stories/074-en
  • Consistency of approach across different areas of activity / commodity / legislation

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Common position with regard to the authorisation of substances of very high concern within REACH

The Confederation of British Industry, the Chemical Industries Association and Greenpeace share the common position that substances requiring an authorisation within REACH according to Title VII, Article 54 of the Commission’s proposal (i.e. substances of very high concern) should be replaced with less hazardous alternatives wherever and whenever practicable.

- Authorization & substitution has the potential to drive innovation to the benefit of business, human health and the environment.

- We therefore urge the Minister to press for substitution to be incorporated into REACH in such a way that the authorisation procedure is effective, but flexible, in progressively phasing-out substances of very high concern.
Access to information (process)
SIN List by Chemsec: extending hazard assessments

• An example of an NGO building upon the work of ECHA to extend reach of REACH

• Uses SVHC criteria established & published under the EU REACH regulation

• Database currently lists 919 hazardous chemicals likely to be banned or restricted in the future under REACH (https://chemsec.org/sin-list/)

• SINimilarity Tool: to help identify if a chemical is linked to any in the SIN List by group, structure, or both (http://sinimilarity.chemsec.org/)

• The aim is to help avoid substituting one problematic chemical with another
ECHA: “The vast majority of the substances in the SIN list are already (or in the process of being) regulated or under scrutiny by authorities, suggesting that SIN list is a valuable tool for industry to predict action by authorities.”
Information availability / assessing chemicals
GreenScreen® for Safer Chemicals (Clean Production Action)

• Clear and consistent methodology
• Fully transparent
• Applicable across different sectors
• Provides clear scores and indications
  • BM1 (Avoid)
  • BM2 (Use, seek substitute),
  • BM3 (Use, continuous improvement),
  • BM4 (Prefer)
• GreenScreen® List Translator, an initial screening tool based on existing lists

https://www.greenscreenchemicals.org/
Information availability / assessing chemicals
GreenScreen® for Safer Chemicals (Clean Production Action)

Confidentiality
• Same transparent process
• Disclose Benchmark scores
• Chemical name/CAS redacted

Example: Klean Coat Case Study
https://www.cleanproduction.org/resources/entry/klean-kanteen-greenscreen

| Substance Name | CASI | M/WL Score | % by wet | C | M | R | D | E | AT | Sts | Str | Sn | Ns | SnS* | SnR* | Irs | IrsE | Irf | Aa | Ca | P | B | Rx | F |
|----------------|------|-------------|----------|---|---|---|---|---|----|----|----|----|----|-----|------|-----|-----|----|----|----|----|----|----|----|----|
| Substance A   | Xxxx | 00-00-0    | 60       | L | L | DG | M | DG | L  | DG | L  | DG | M  | R  | M  | L  | H  | L  | L  | L  | L  | L  | L  |
| Substance C   | 0000 | 00-00-0    | 8        | L | L | DG | M | DG | L  | DG | L  | DG | M  | R  | M  | L  | H  | L  | L  | L  | L  | L  | L  |
| Substance D   | 0000 | 00-00-0    | 8        | L | L | DG | M | DG | L  | DG | L  | DG | M  | R  | M  | L  | H  | L  | L  | L  | L  | L  | L  |
| Substance E   | Xxxx | 00-00-0    | 4        | L | L | DG | L | L  | Dg | Dg | L  | L  | Dg | L  | M  | L  | M  | M  | M  | M  | M  | M  | M  | M  |

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Access to information (regulation & monitoring)
NGO work enabled by transparent output from ECHA (and elsewhere in EU)

Greenpeace ‘Detox’ campaign (textiles and fashion): focused on 11 priority groups of chemicals

• Chemicals relevant to the textile sector
• Chemical groups with examples listed on international or regional (eg EU) regulations / conventions that require restriction and/or elimination
  • OSPAR List of Chemicals for Priority Action
  • STOCKHOLM convention
  • HELCOM – substances for priority action and substances of concern under Baltic Sea Action Plan
  • EU Water Framework Directive list of priority hazardous substances
  • REACH SVHCs
  • REACH Annex XVII
• Greenpeace Detox My Fashion campaign
• Focus on chemical use in the supply chain, not only residues in products
• Testing products for presence of hazardous chemicals
• Investigate releases from manufacturing facilities
• Brands commit to ‘detox’ their manufacturing supply chain
• Monitor progress by brands on their commitments

Timeline and reports: https://www.greenpeace.org/international/act/detox/
Collaboration between stakeholders: NGO & Industry
Supply chain evaluation and management

• Moving towards slowing & closing the loop
• Some retailers make commitments to increase sale of products that last longer & are easier to recycle

• July 2018: Destination Zero
  • Progress of global clothing brands and suppliers in ‘detoxing’ from use of hazardous chemicals
  • Identify future challenges

Timeline and reports: https://www.greenpeace.org/international/act/detox/
Collaboration between stakeholders: NGO & Industry
Prato textile district, Italy

- Italy’s largest fashion supply chain pledged to ‘Detox’ hazardous chemicals
- Eliminate from the supply chain by 2020
- The largest Detox commitment of its kind
- 20 companies from Italy’s Prato textile district
- Affects over 13 thousand tons of yarn and raw materials as well as over 13 million meters of fabric every year.

www.confindustriatoscananord.it/sostenibilita/detox
Collaboration between stakeholders: NGO & Industry

PFCs: An example of NGO technical and professional capability

- Product testing & investigations of manufacturing facilities
- Also environmental contamination
- Leading to brand policies

Technical input to brand policy development:
- Gore Fabrics release Goal and Roadmap for eliminating ‘PFCs of Environmental Concern’
  [www.gore-tex.co.uk/technology/responsibility/pfc-goal](http://www.gore-tex.co.uk/technology/responsibility/pfc-goal)
- Gore Fabrics study on end-of-life aspects (PTFE incineration)
Back to policy: Contribute to development of EU regulations
Nonylphenol ethoxylates (NPEs) in textiles

• Collaboration with Industry leading back to collaboration with policy makers
• Background: manufacture and use of NPEs regulated in EU since 2005
  • Did not cover residues in imported textiles, due to the use of NPEs in textile manufacture outside the EU
• 2016: Regulation of NPEs in textiles imported into the EU after February 2021
  (above 0.01% NPE by weight)
• NGO studies contribute to data on levels of NPEs in imported textiles, and estimates of releases to EU waters post-sale

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Collaboration between stakeholders: NGO and independent verification/certification bodies

OEKO-TEX® – Detox to Zero tool

• Analysis and evaluation in accordance with Detox to Zero criteria
  • Chemical management systems
  • Composition of wastewaters & other wastes
• Developed by OEKO-TEX® to align with Greenpeace Detox campaign

• Independent of NGO
• Independent of manufacturers

www.oeko-tex.com/detoxtozero
From functional substitution to greater sustainability

• A focus on function might help break deadlock where chemicals are difficult to substitute within existing products
• Need to look across whole supply chain to identify problems and potential solutions (and potential partners and innovators)
• As far as possible, ‘loop the chain’
  • Close the loop
  • Clean the loop (may need to be the first step to closing it)
  • Slow the loop (substitution alone will not tackle over-consumption)
• Explore ‘emotionally durable design’ – what makes us want to keep things and how can we build on that?