Chemicals managment in practice

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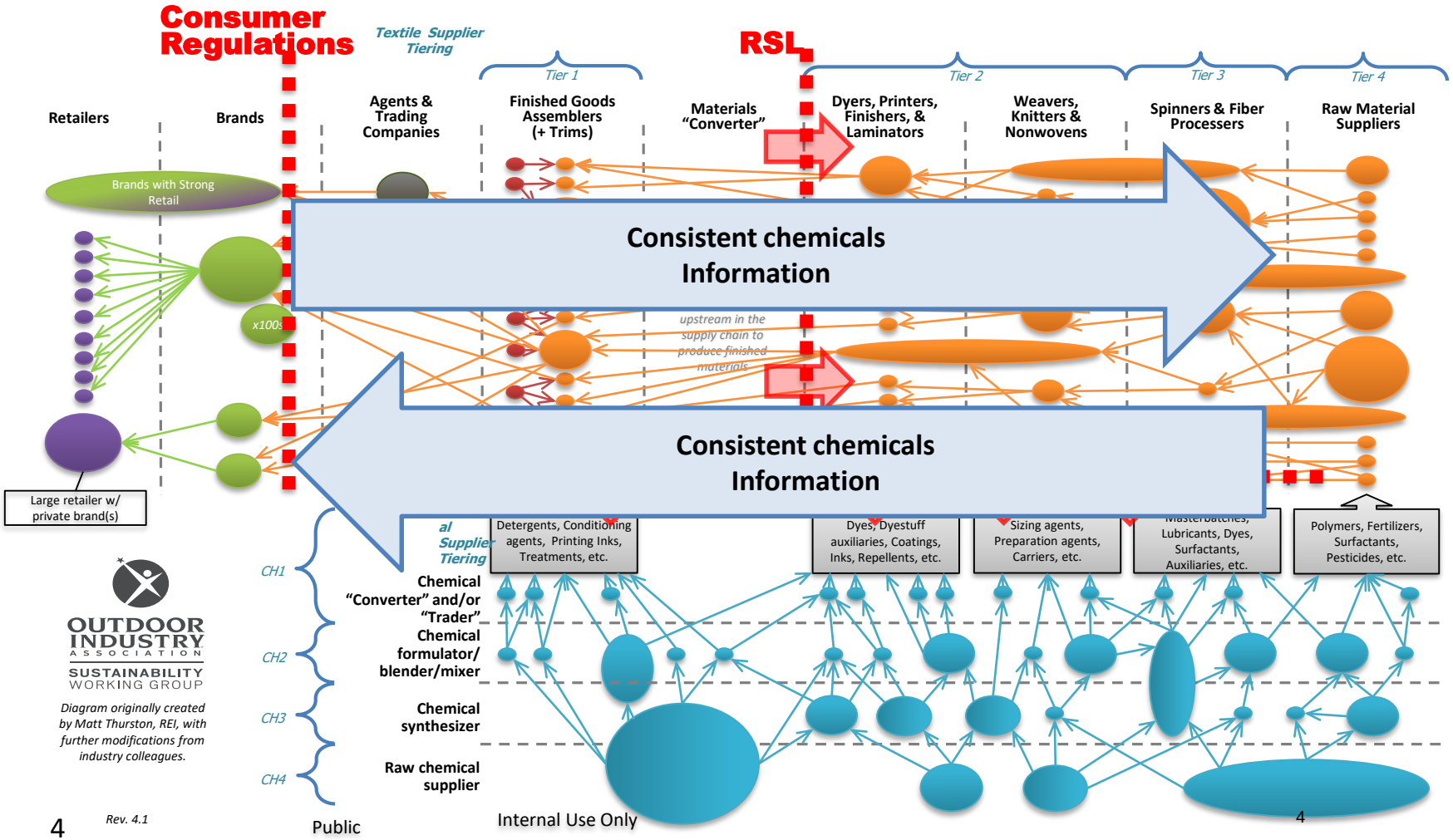
Today talking points that reflect the Green Deal chemicals new policy

- Transparancy, tracebility and origin vs Complex value chains
- Grouping of hazardous chemicals based on their properties
- Focus on relevant hazardous chemicals for their purpose and occurrence
- Essential uses and strategic value chains
- Effective chemicals assessment and substitution
- Two cases: PFAS in PPE and medical applications

The value chain – complex

A simplified version below



OUTDOOR INDUSTRY ASSOCIATION
SUSTAINABILITY WORKING GROUP

Diagram originally created by Matt Thurston, REI, with further modifications from industry colleagues.

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HOW TO PRIORITIZE “BAD” CHEMICALS FOR EFFECTIVE CHEMICALS MANAGMENT?

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How to prioritize “bad” chemicals

- **Relevance** to the specific category and materials used.
  - These ”bad” chemicals may really be currently used and may therefore be identified and non regrettable substituted in each specific value chain.
- What means **”bad”**
  - Serious hazards
    - CMR, ED, Allergenes,
  - Environmental impact
    - PBT, PMT

Hazard – suggested ranking and priority?

Worst

- **H340** – May cause genetic defects.
- **H350** – May cause cancer.
- **H360** – May damage fertility or the unborn child.
- **Endocrine disruptors**

Worse

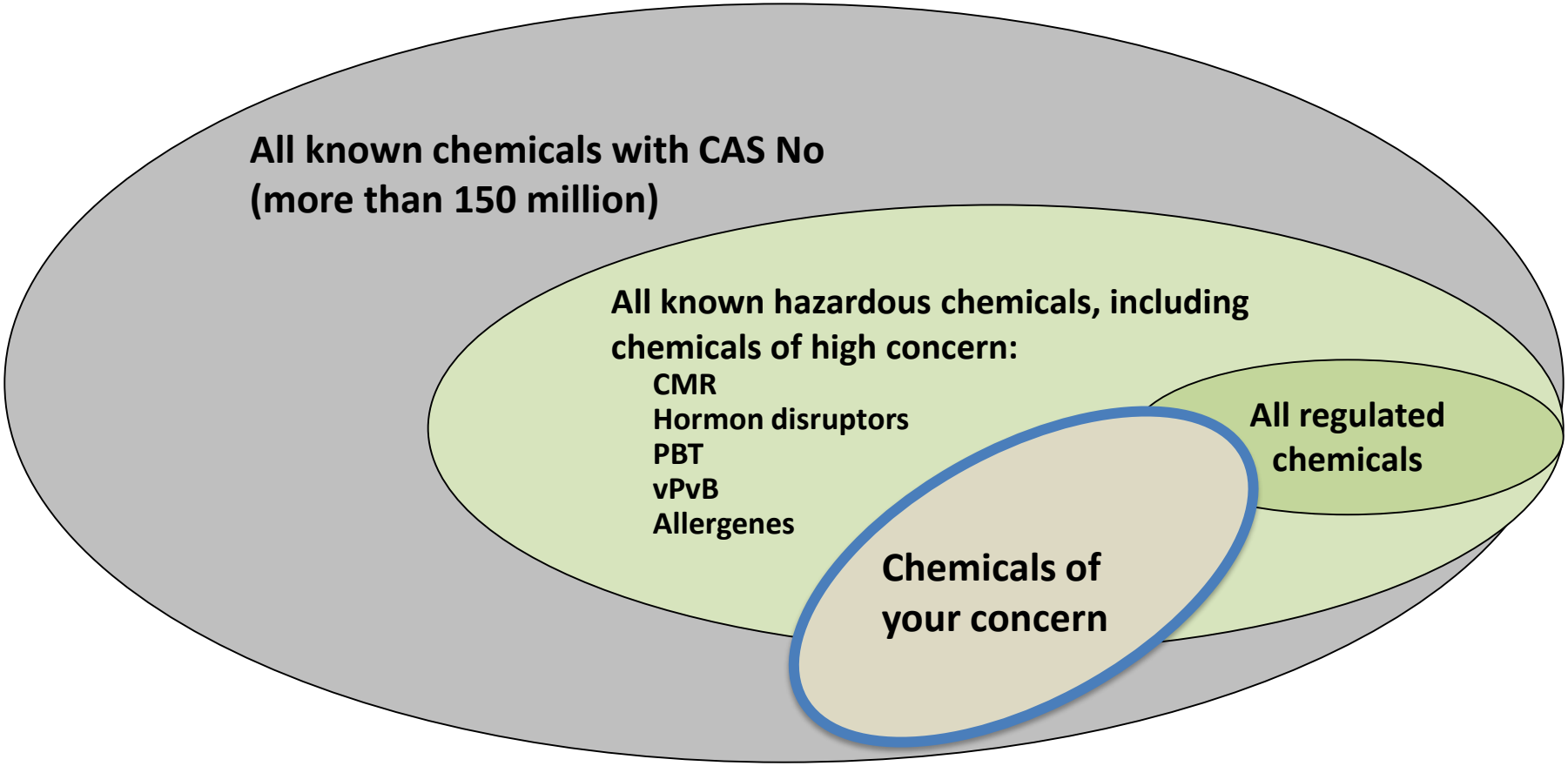
- **H341** – Suspected of causing genetic defects.
- **H351** – Suspected of causing cancer.
- **H361** – Suspected of damaging fertility or the unborn child.
- **H362** – May cause harm to breast-fed children.

Bad

- **H317 –** May cause an allergic skin reaction.
- **H334** – May cause allergy or asthma symptoms or breathing difficulties if inhaled.

FOCUS AND MAKE CORRECT PRIORITIES IN YOUR CURRENT VALUE CHAIN

All chemicals are not your concern



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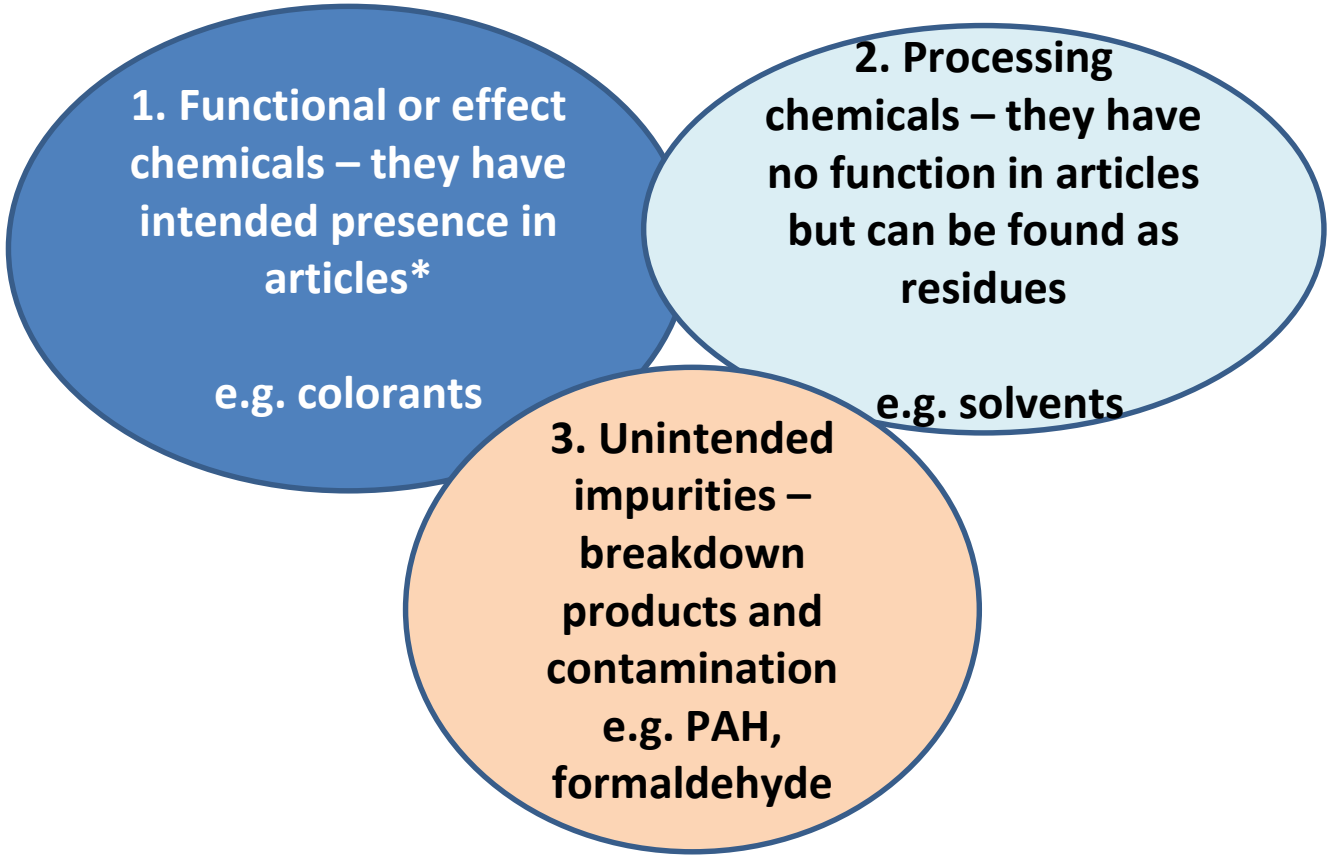
Some chemicals are for intended and some for non intended use and occurrence



**Effect chemicals = functional chemicals represents approximately 5% of the total chemical load in the finishing/dyeing processes*

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Essential uses of chemicals?

When there are reasons for continued use of Chemicals of Concern (CoC) e.g PFAS and its alternatives, some criteria need to be fulfilled to declare these uses as essential

- for health and life protection
- when critical for the functioning of society
- when no available technically and economically feasible alternatives or substitutes, that are acceptable from environmental and health point of view.

If one or more of these criteria are not met, the use cannot be considered as essential.

Approaches for substitution in practice

- ***Substitution in practice*** - how do you practice a complete value chain?
- ***Technical performance -*** The product's required features to function as intended
- ***Health and environmental performance*** - hazard and relevant risk scenarios
- ***Precautionary principle*** - Decision making despite certain lack of data
- ***Holistic perspective*** - Life cycle perspective
- ***Cost-effectiveness*** - Life Cycle Costs (LCC) and socio-economic effects, such as consumer-related aspects

Chemicals managment towards (almost**) non toxic chemistry in reality**

- **Identification** of hazards that pose unacceptable risks
- **Understanding** how these are used and where they occur in value chains
- Are identified hazards essential for the specific purpose and use (performance & design?
- **If non essential** concerning performance and design, this chemistry can be removed or non regrettable substituted.
- **If confirmed essential no substitution currently possible**.

LEGAL ASPECTS

Legal international approach to regulate Chemicals of Concern (CoC)

- International regulations may vary in detail, but they have a common baseline to regulate hazardous chemicals according to certain criteria.
- In most regulatory systems worldwide, chemicals of concern **(CoC) are regulated based on their hazards and unacceptable risks** they may pose on humans and environment.
- Worldwide, several legal schemes apply systematic hazard assessment and risk reduction for the phase out of hazardous compounds and phase in of non-hazardous compounds with equally technical performance and uses.

Risk and hazard are key for effective regulation

- **Effective substitution requires knowledge of CoC hazards and environmental impact**
  - of hazardous substances requires the characterization of the inherent hazardous properties of various substances according to certain scientific criteria.
- **Comprehensive understanding of normal foreseeable uses.**
  - In different situations, where the substance is used, it may constitute some form of risk depending on how the substance is used and exposed in different scenarios, where certain scenarios constitute unacceptable risks to the recipient.
- **Implement non regrettable substitution**
  - Knowledge about the hazard of different substances and how they are used and emitted under normal conditions, is required to be able to implement real substitution.

PFASs used in PPE applications
Case PFAS - PPE

There are some category III PPE applications, where PFAS is likely to be required to comply the legal requirements according to Annex I of the PPE regulation (EU 2016/425).

These critical properties (performance) may be.

- Protection against liquid and gaseous chemicals, including aerosols and solid particles and microorganisms.
- For firefighting, military, and law enforcement activities.
- Use, care, and maintenance of category III PPE workwear (e.g., reimpregnation done by laundries).

- Conclusivle it is always a balance consideration between technical benefit and risk

PFASs used in medical applications
Case PFAS - medical

Fluorinated chemicals are used as pharmaceuticals, cleaning agents, solvents, heat transfer fluid (cooling agents) and lubricating agents in many medical applications and during the production of medical equipment.

- PFAS pharmaceuticals
  - Twelve polyfluorinated pharmaceuticals have been included in the WHO Essential Medicines List from 2019.
  - Consideration of non PFAS alternatives if possible.
- Processing aids for PTFE packaging materials
  - non-florinated alternatives have been considered, but they were not able to provide equal performance.
- Precision cleaning - engineered fluids for medical devices and equipment
  - Perfluorinated engineered fluids are replacements to ozone-depleting solvents and high global warming potential (GWP) hydrofluorocarbons.
- Surface treatment
  - Coating of the MDI (Metered dose inhalers) to prevent interaction of the medical ingredient with the casing
  - Dry etching of medical devices through bombardment of ions
- Medical coolers and freeze dryers to preserve biological samples
- And more……

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