How can we reduce PFAS emissions to the environment?

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Interreg Baltic Sea Region

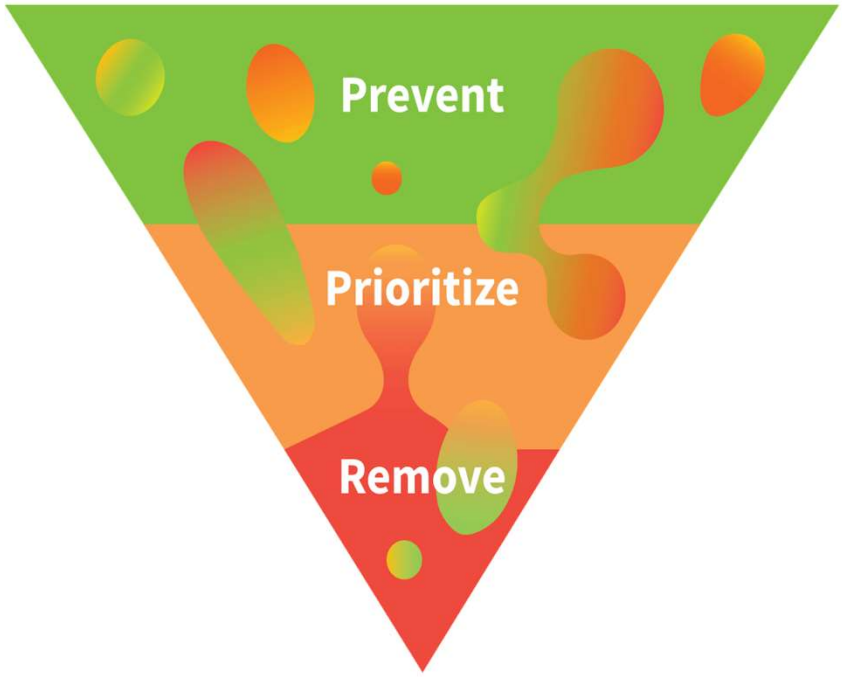
Co-funded by the European Union

SUSTAINABLE WATERS EMPEREST

Reducing emissions

- Stop further emissions from entering the environment
  - Manufacture
  - Use
  - Disposal

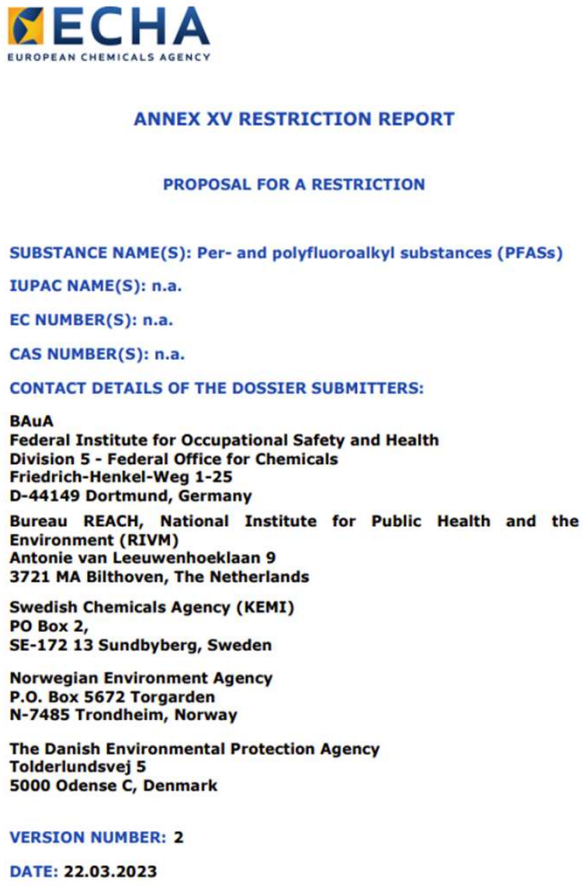
- Clean up areas that are already contaminated



- ZeroPM will interlink and synergize three strategies to protect the environment and human health from persistent, mobile substances: **Prevent**, **Prioritize** and **Remove**

Policy to reduce emissions

- Upcoming broad PFAS restriction
- Under scrutiny by ECHA through RAC and SEAC
- Different derogation times for different sectors



ECHA
EUROPEAN CHEMICALS AGENCY

ANNEX XV RESTRICTION REPORT

PROPOSAL FOR A RESTRICTION

SUBSTANCE NAME(S): Per- and polyfluoroalkyl substances (PFASs)

IUPAC NAME(S): n.a.

EC NUMBER(S): n.a.

CAS NUMBER(S): n.a.

CONTACT DETAILS OF THE DOSSIER SUBMITTERS:

BAuA
Federal Institute for Occupational Safety and Health
Division 5 - Federal Office for Chemicals
Friedrich-Henkel-Weg 1-25
D-44149 Dortmund, Germany

Bureau REACH, National Institute for Public Health and the Environment (RIVM)
Antonie van Leeuwenhoeklaan 9
3721 MA Bilthoven, The Netherlands

Swedish Chemicals Agency (KEMI)
PO Box 2,
SE-172 13 Sundbyberg, Sweden

Norwegian Environment Agency
P.O. Box 5672 Torgarden
N-7485 Trondheim, Norway

The Danish Environmental Protection Agency
Tolderlundsvej 5
5000 Odense C, Denmark

VERSION NUMBER: 2

DATE: 22.03.2023

A behavioural change to reduce emissions

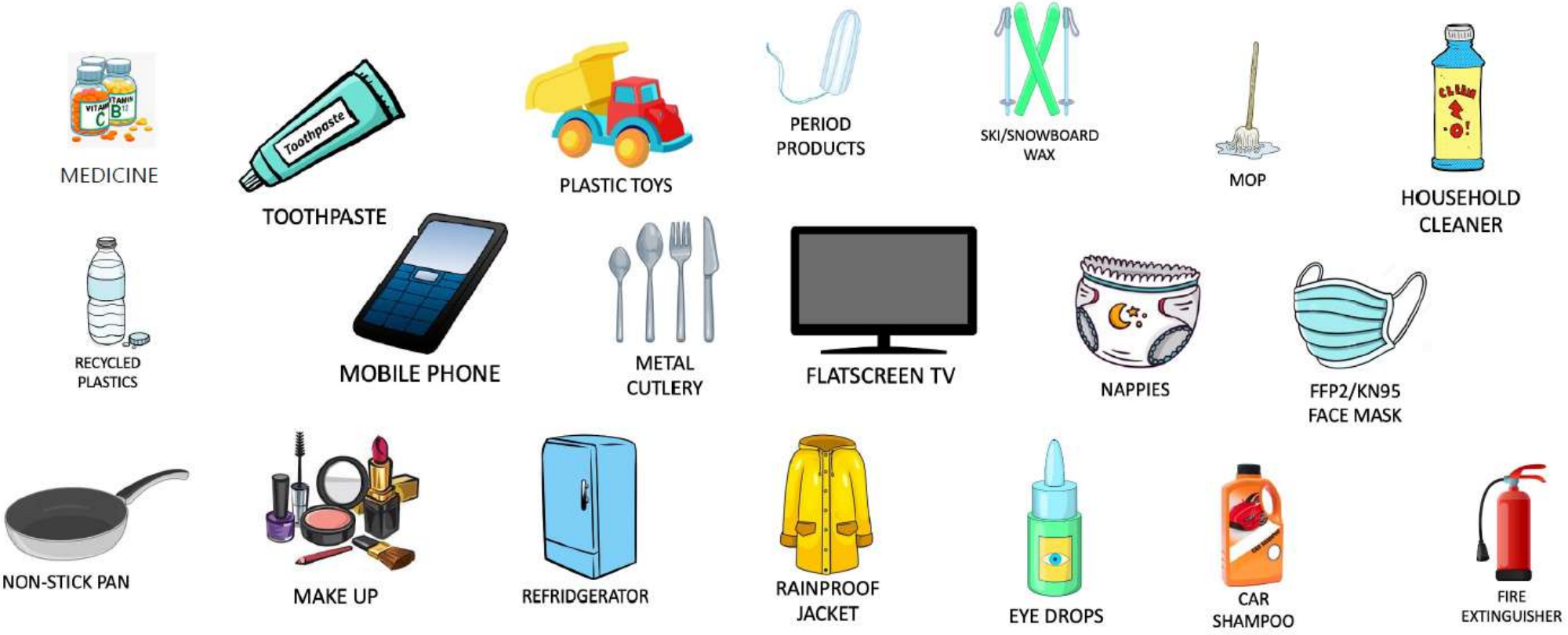
- Do you know what you are buying?
- Does it contain PFAS?
- How can consumers reduce consumption which in turn reduces manufacture?
- What is essential?





PFAS essentiality

How do experts/non-experts differ in their perceptions of where PFAS should be allowed in everyday products?

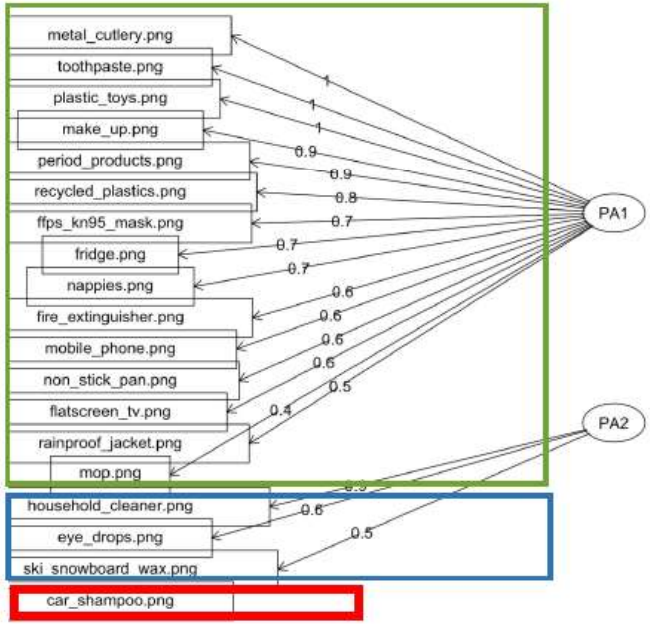


Glüge, J., Scheringer, M., Cousins, I. T., DeWitt, J. C., Goldenman, G., Herzke, D., ... & Wang, Z. (2020). An overview of the uses of per-and polyfluoroalkyl substances (PFAS). *Environmental Science: Processes & Impacts*, *22*(12), 2345-2373.

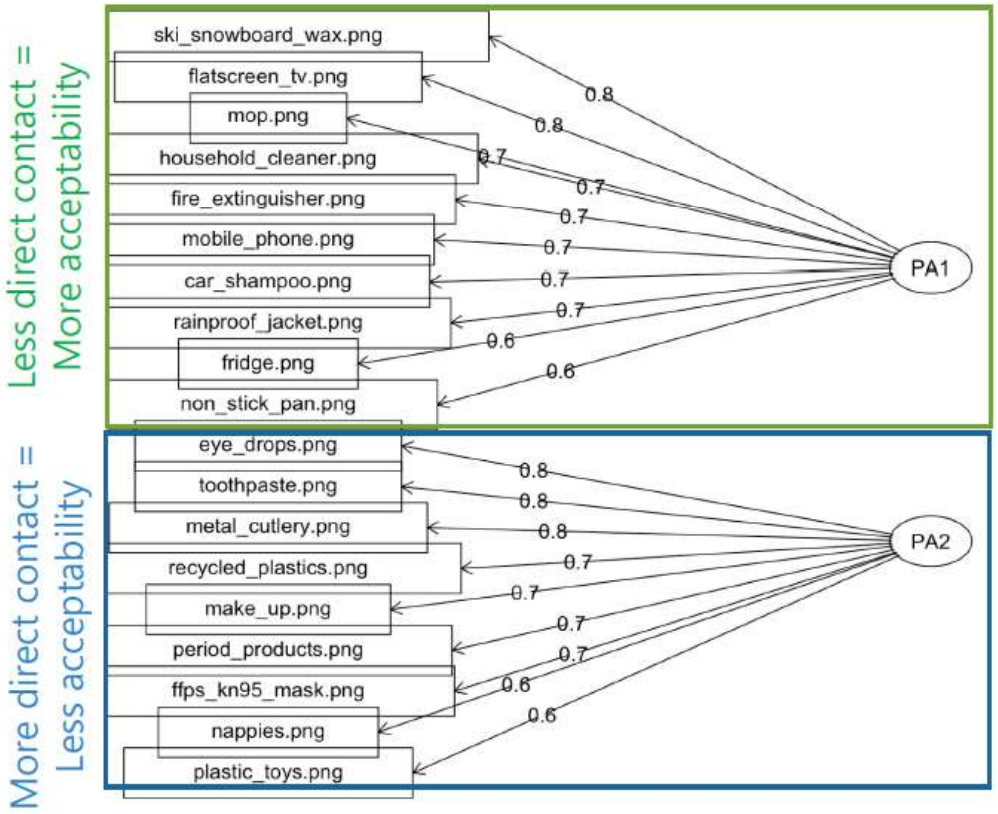
PFAS acceptability

In the non-experts, we see a split of products that come into direct vs. indirect contact with the body! *(exploratory factor analysis).*

Experts (N=29) – no clear pattern/floor effect



Non-expert (N= 53) – direct/indirect split



Suffill, Hoerberg, Pahl & White (in prep; 2024)

Qualitative interviews

(19 non-experts; 11 experts)

Theme	Key finding
Which everyday products are essential & why?	**Essential isn't just 'health, safety & functioning of society'** • *"Non-essential" products can relate to work (e.g., make-up for actors).* • *Mental aspects (self-esteem) are important to well-being.*
Where do you think chemicals like PFAS are found?	**Lack of knowledge increases reliance upon 'trust in regulation'** • *When people can't perform an adequate risk analysis, it increases reliance in trust in regulatory bodies to protect them.* • *Risk perception is higher for items related to vulnerable groups (e.g., children's toys).*
How does PFAS get into our bodies?	**Fixation on direct exposure routes & the use phase** • *People think of exposure mainly through direct routes (e.g., oral, dermal uptake)* • *Because of this, they also focus mainly on the use phase of products with PFAS (instead of exposure via pollution from production or disposal).*

Does not mean PFAS in make-up is essential

E.g., see microbeads.

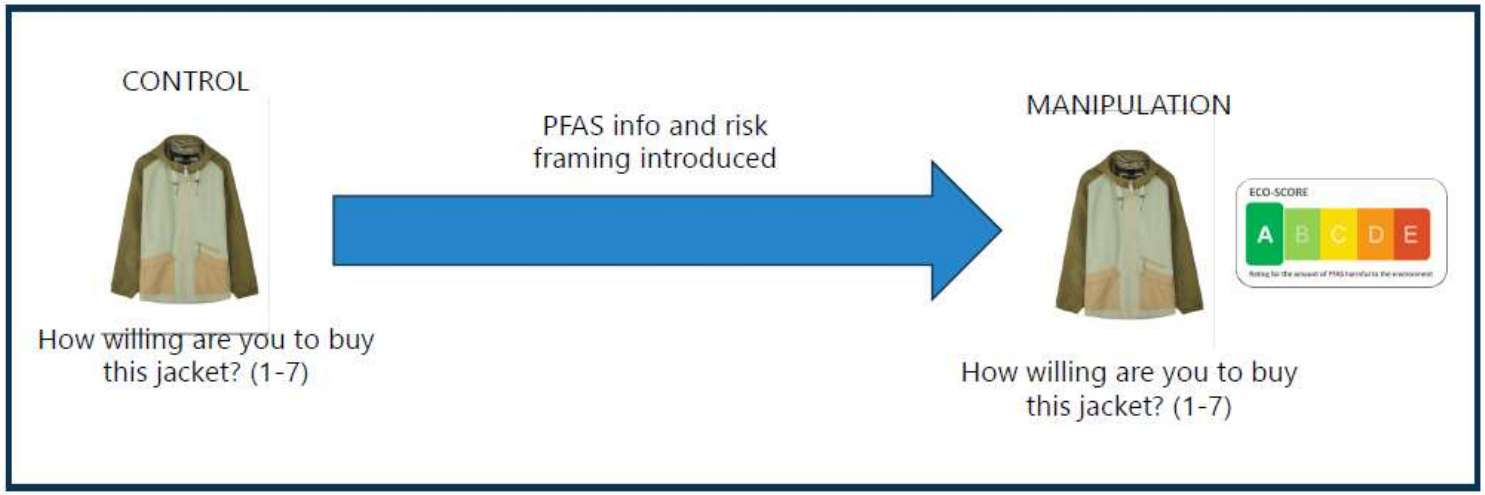
Suffill, Hoerberg, Pahl & White (in prep; 2024)

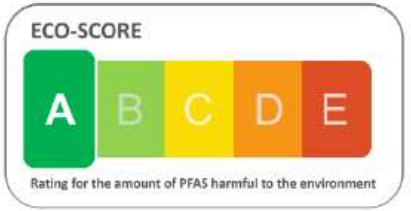
How do PFAS labels affect consumer intentions?

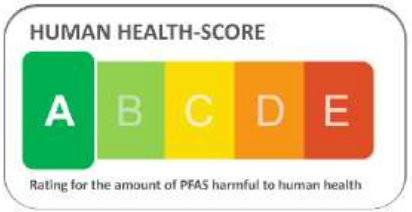
N = 450

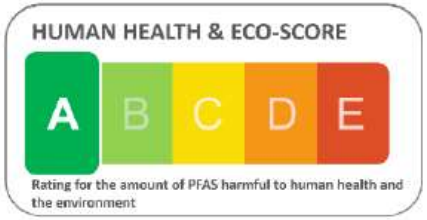
In prior work, we found that warning labels reduce WTB regardless of PFAS knowledge

- What about a traffic-light scheme (A-E) which gives info on PFAS amount?
- Does risk framing (eco, health, both) effect WTB?
- Control for additional factors like attractiveness; brand recognition, etc.









Hoerberg & Suffill et al. (in prep – 2 study experimental paper, JCP)

Reducing PFAS emissions by identifying alternatives

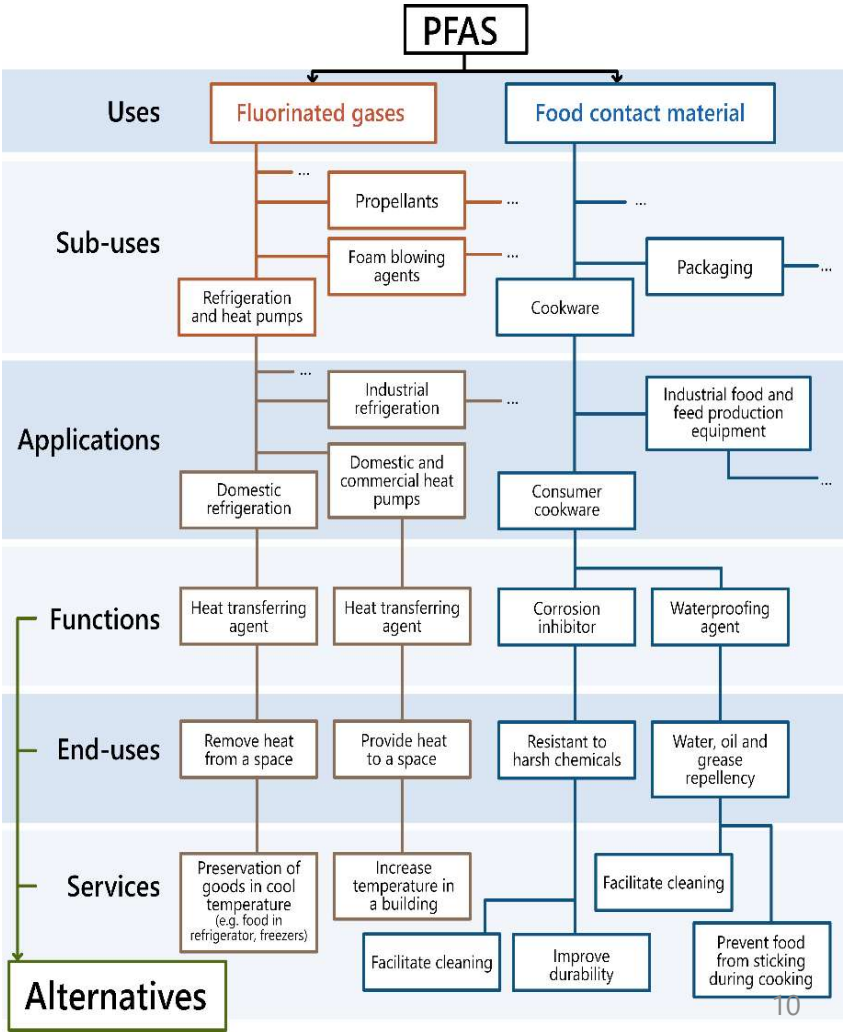
- We need to identify safer chemical alternatives to non-essential uses of PM substances
- To avoid regrettable substitution (GenX for PFOA)
- Which can be achieved by
  - Constructing a database of potential chemical and functional alternatives

ZeroPM Alternatives Database

- The database provides chemical function, end-use function, and function as a service for each use of a substances of concern
- List of identified potential alternatives to PFAS for each application

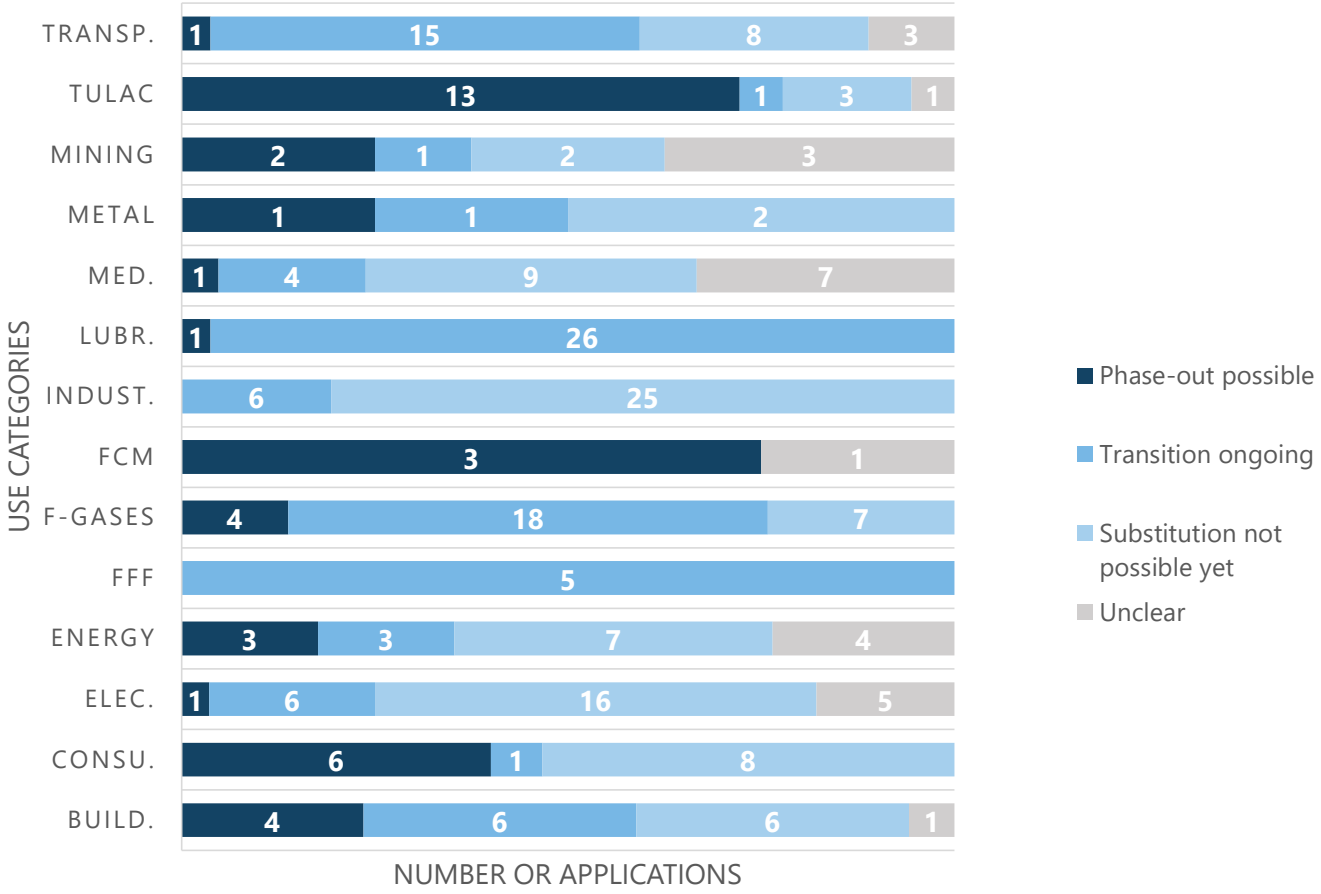
Use categories	
Active pharmaceutical ingredients Biocidal product Building and construction products Consumer mixtures Cosmetics Electronics and semiconductors Energy sector Fluorinated gases Food contact materials	Lubricant Medical devices Metal products manufacture and metal plating Petroleum and mining Plant protection products Ski wax Transport Textile, upholstery, leather, apparel, and carpets (TULAC)

[ZeroPM Alternative Assessment Database - ZeroPM]



Are the alternatives suitable and available?

- Overall, suitable alternatives available for ~75% of PFAS applications



Reducing PFAS emissions by supporting industry

- We need to catalyse a market transition away from PFAS and to safer alternatives
- This can be achieved by
  - Assisting, encouraging and connecting companies
  - Developing tools that support industry to identify PFAS in their products and supply chains

Moving away from PFAS

Organisations who have pledged to transition away from PFAS



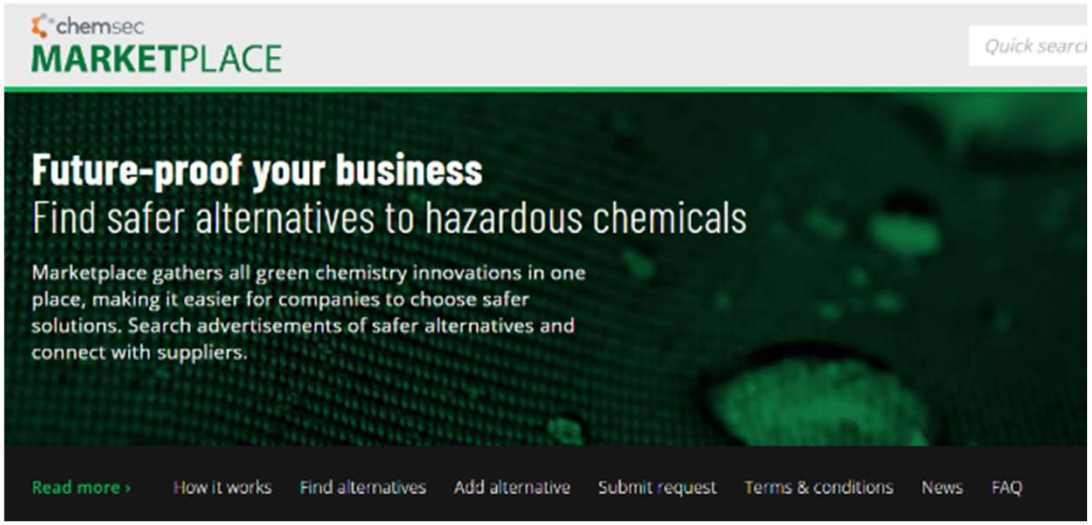
Tools to support the market transition





[PFAS Guide - Find PFAS chemicals in your products (chemsec.org)]

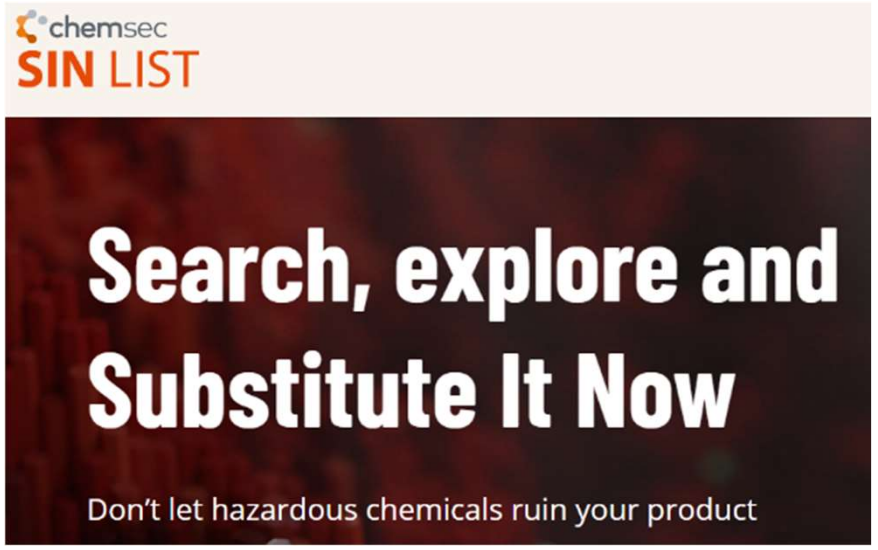
Tools to support the market transition



https://marketplace.chemsec.org/

The SIN List helps you identify the most relevant PFAS and other hazardous substances to start substituting (before regulators make you)
Updated in November 2023 with additional PFAS

https://sinlist.chemsec.org/



Looking to the future

- Prevention is better than cure
- Stakeholder engagement is key



Thank-you!!

Website: https://zeropm.eu/

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Youtube: @ZeroPM-H2020

Spotify & Apple: ZeroPM

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