

PFAS Product Policy

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Health
Food Chain Safety
Environment

Content



What and why are PFAS?

Chemical identity and uses
Environmental fate
Pollution
Risks



How are PFAS regulated?

History of regulation
REACH restrictions and Stockholm Convention
Sectoral and National actions



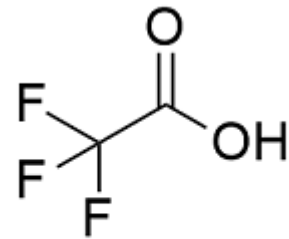
Conclusion

What and Why are PFAS?

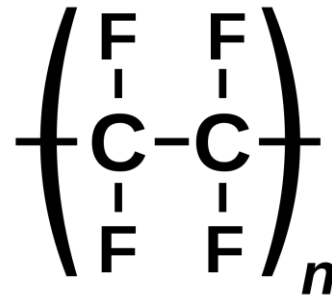
PFAS: Per- and PolyFluoroAlkyl Substances

PFASs are defined as fluorinated substances that contain at least one **fully fluorinated methyl or methylene carbon atom (without any H/Cl/Br/I atom attached to it)**, i.e. with a few noted exceptions, any chemical with at least a perfluorinated methyl group ($-\text{CF}_3$) or a perfluorinated methylene group ($-\text{CF}_2-$) is a PFAS.

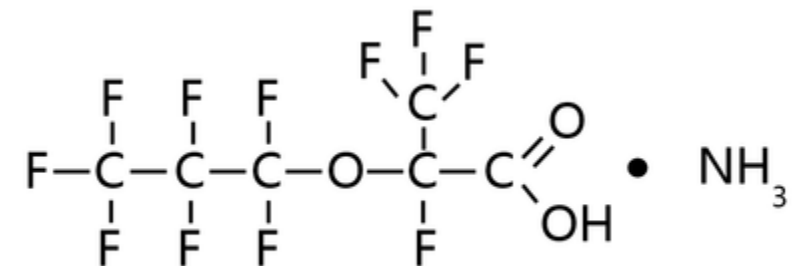
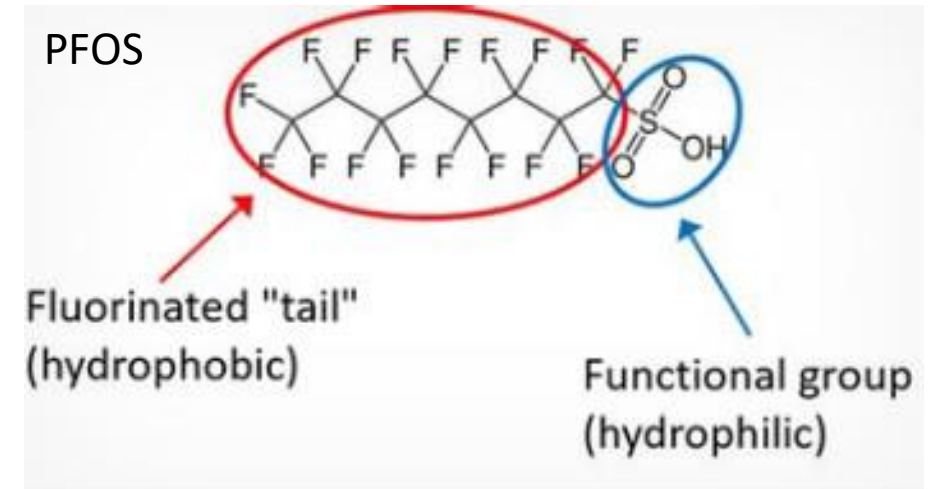
- Synthetic chemicals
 - Produced since 1950s
- Defined by Carbon Fluor bond (C-F)
 - One of the strongest chemical bonds
 - "forever chemicals"
- Very large group of substances (4000 +)
 - "classical" PFAS (PFOS, PFOA)
 - Fluoropolymers
 - Fluorinated gasses



trifluoroacetic acid



PTFE (Teflon)



GenX Chemical Structure

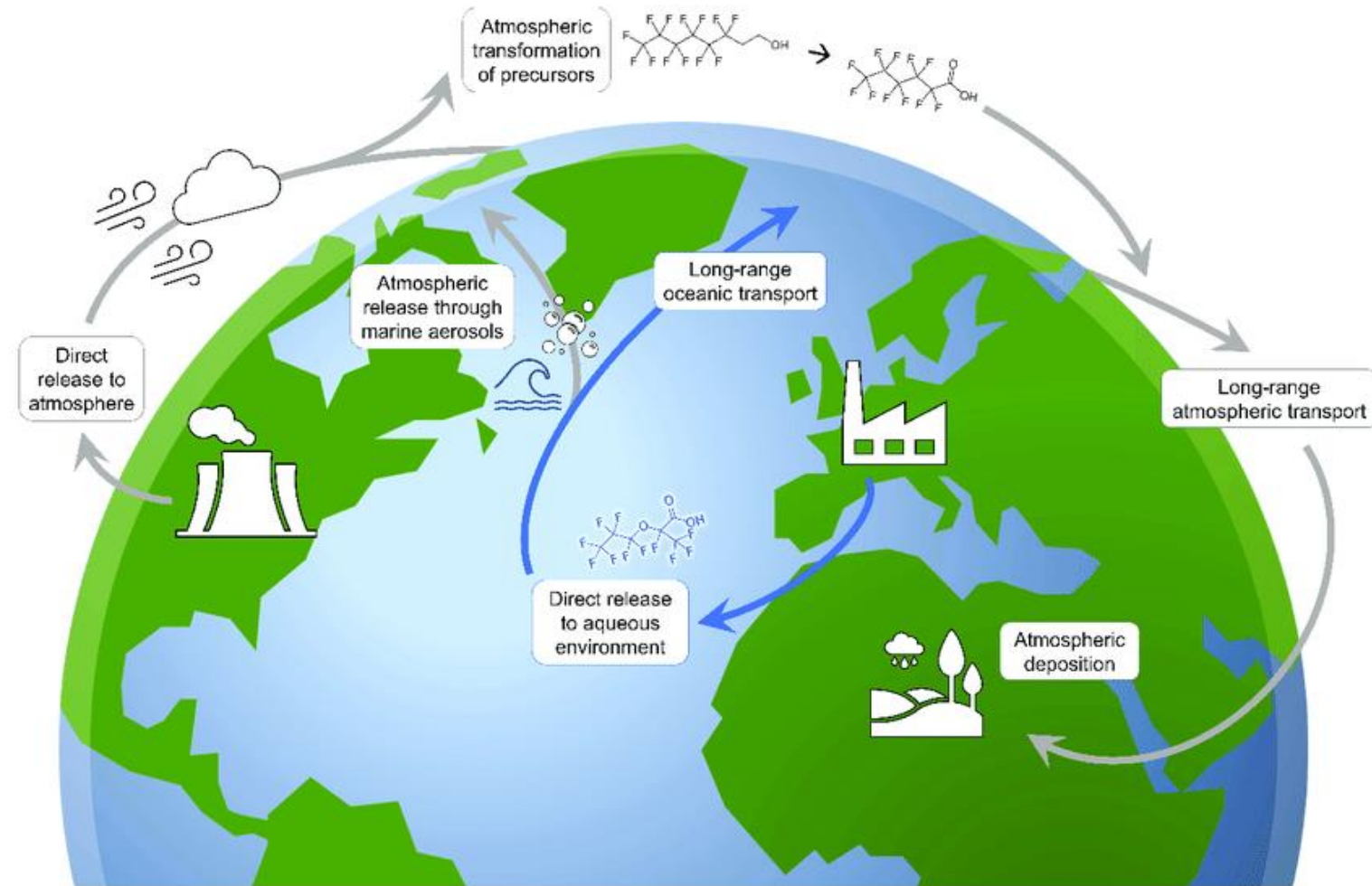
PFAS uses

- C-F bond is very strong → very stable molecules → interesting characteristics
 - **Stability and thermo resistance (can withstand high temperatures)**
 - Electrical wire coating
 - Personal Protection equipment (fire fighting gear)
 - Fire fighting foams
 - **Water and grease repellent characteristics**
 - Outdoor gear like tents, shoes and raincoats (for example Gore-Tex)
 - Non-stick pots and pans (Tefal)
 - **Also used in medical applications and green technologies**
 - Coating of operating tubes, heat pumps, use in batteries and solar panels
 - Essential use?



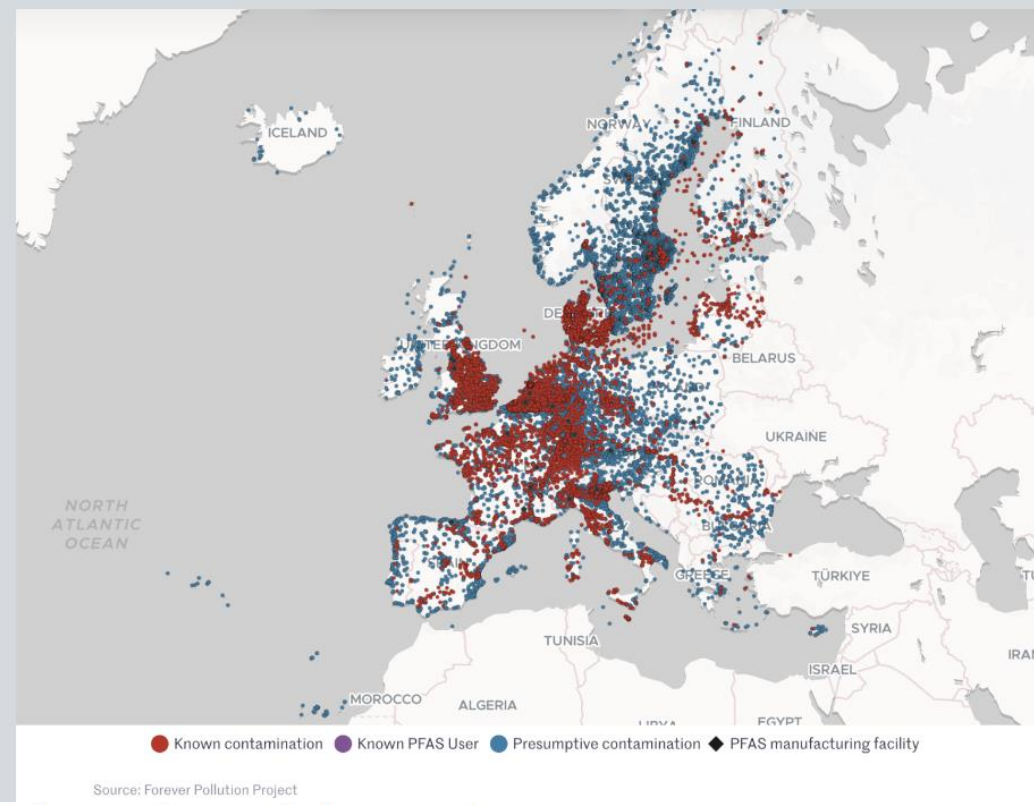
Emissions and environmental fate of PFAS

- Many uses = many emissions
- Main emissions sources:
 - Textiles
 - Fluorinated gasses
 - Medical devices
- Landfill leachate
- Incomplete incineration → release of PFAS to atmosphere
- Many PFAS are mobile → end up in water resources
- C-F bond is extremely persistent → also in the environment
 - Ubiquitous contamination
 - Nearly irreversible environmental contamination
 - Very hard to remove from water, soil and air



PFAS pollution

- Over the last decades large scale pollution near PFAS production sites have been uncovered
 - US: Dupont and 3M
 - Italy: Miteni Ltd. and Solvay
 - Netherlands: Chemours
 - Belgium: 3M
 - ...
- Hotspots where firefighting foams have been used
- Significantly higher PFAS concentrations are found in populations living near such contaminated sites
 - However, lot of diffuse emissions + mobility → background levels are found everywhere
- Very high costs associated to remediating the PFAS pollution
 - Can be difficult to link pollution with polluter → costs are many times paid by the society



PFAS class action settled over toxic firefighting foam at three Australian defence bases

Environmental activist Erin Brockovich welcomes settlement, saying it allows affected communities to move forward

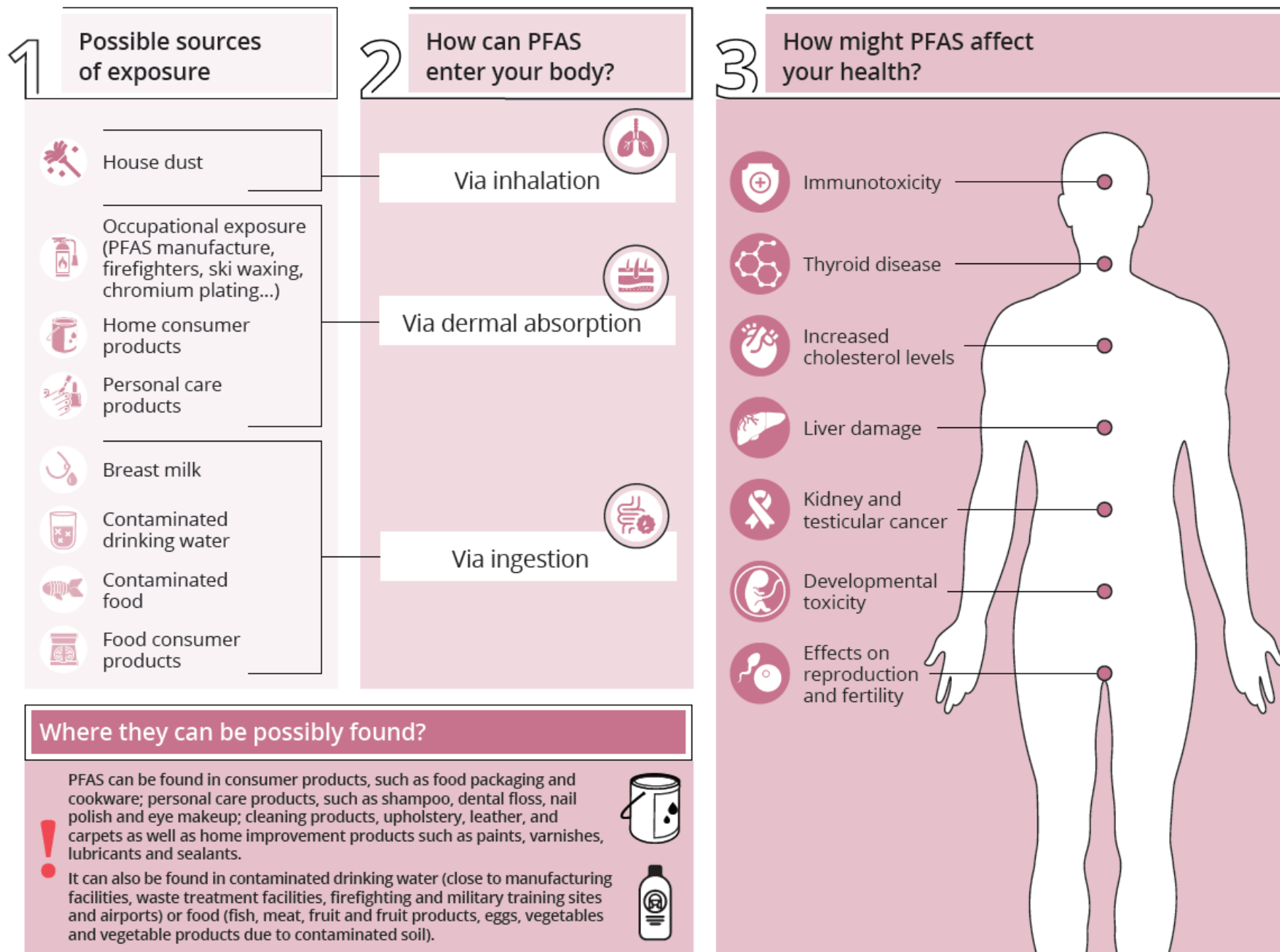


Figure 1. Overview of exposure sources, pathways and health effects associated with PFASs

PFAS risk

- Several exposure pathways for humans
- Food and drinking water are main sources
- Several health effects have been linked with PFAS exposure
- Only few PFAS are highly studied (PFOA, PFOS, PFHxS, etc.)

→ Large amount of uncertainty remains on vast majority of PFAS



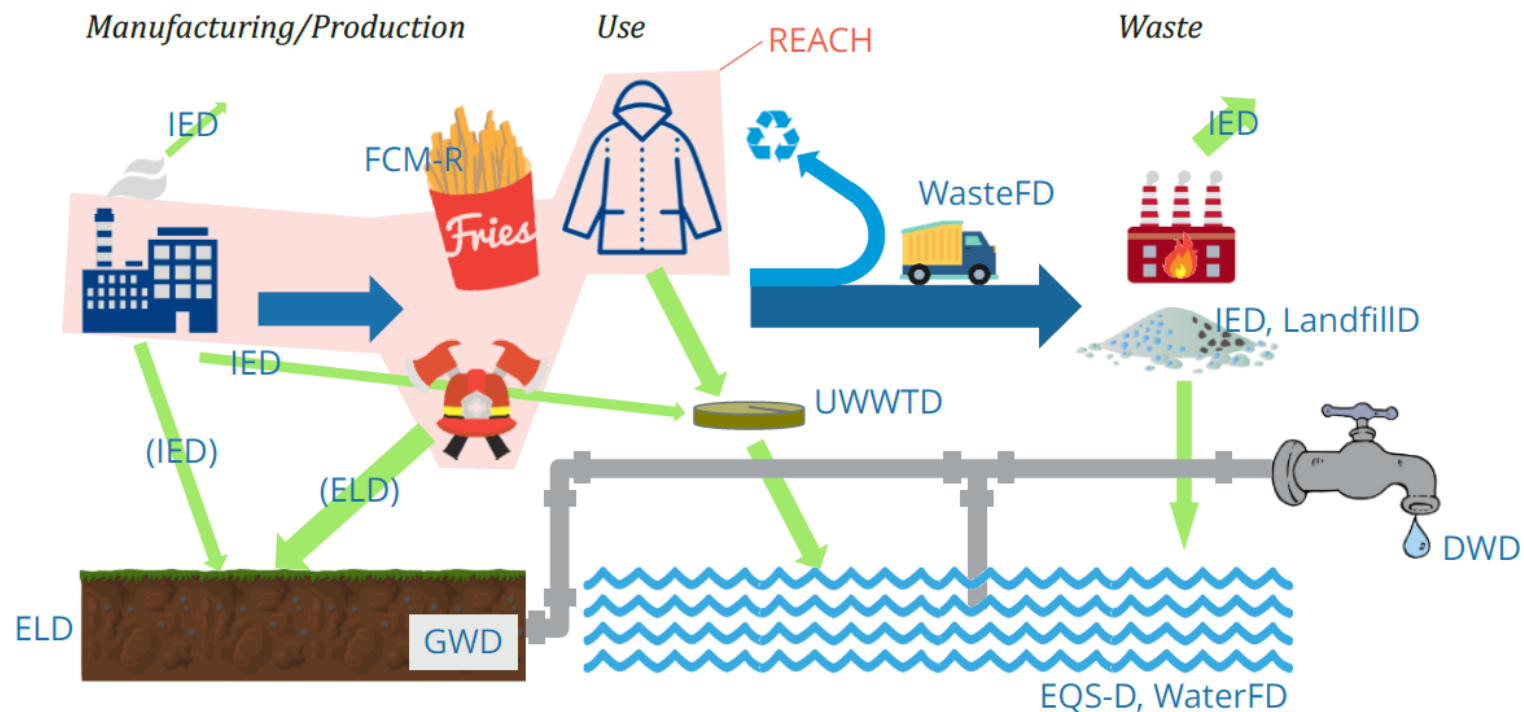
How are PFAS regulated?

International and European product policy legislation

Large variety of regulations tackle PFAS

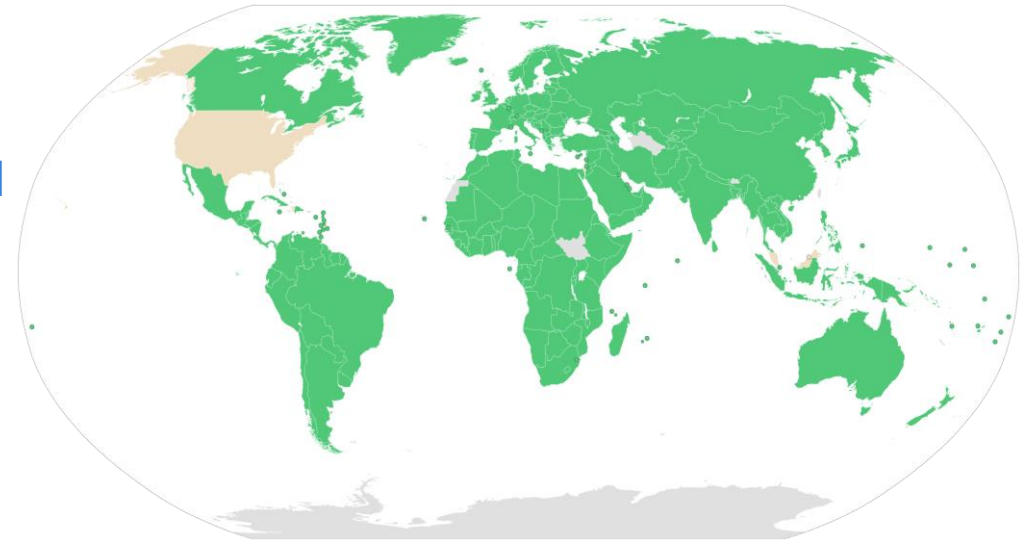
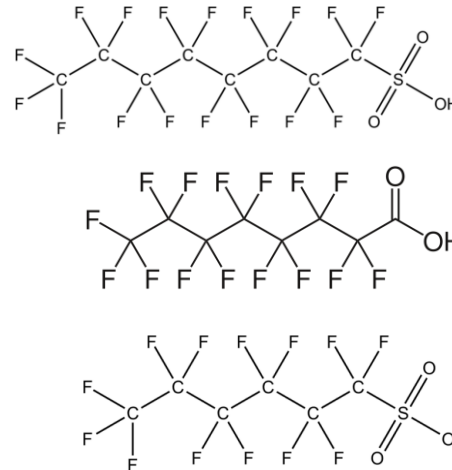
- Many different regulations and directives
 - Industrial emissions directive (IED)
 - Food Contact Material Regulation (FCM)
 - Waste Framework Directive
 - Water Framework Directive
 - Etc.
- Focus today on product policy:
 - Stockholm Convention (POP)
 - REACH
 - Packaging and Waste (PPWR)

Considering PFAS persistency and difficulties with remediation
→ production, use and market bans are some of the most efficient policy tools to tackle the PFAS concern



Stockholm Convention: 3 PFAS restrictions in force

- International Convention on Persistent Organic Pollutants
 - 186 parties and 152 signatories
 - Implemented in the EU under the POP Regulation ((EU) 2019/1021)
 - Market, production and use restrictions of Persistent and Organic Pollutants (POPs)
 - PFAS under this convention:
 - PFOS and related substances (2009)
 - PFOA and related substances (2020)
 - PFHxS and related substances (2023)
 - PFAS to be included:
 - C9-C20 PFCAs
- Obligations for members:
 - Provide data on stocks
 - Ensure proper waste management
 - Report on inspections



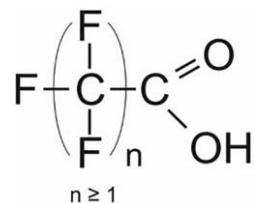
STOCKHOLM CONVENTION

REACH: 2 PFAS restrictions in force

REACH = Registration, Evaluation, Authorisation and Restriction of CHemicals – (EC) No 1907/2006

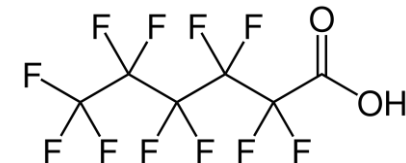
- C9-C14 PFCA's restriction

- "long-chain" PFAS
- Restricting all uses, some transition periods for:
 - Personal protection equipment
 - Industrial applications
 - Medical devices
 - etc.
- Entered into force August 2021
 - Last transition period will end in 2030



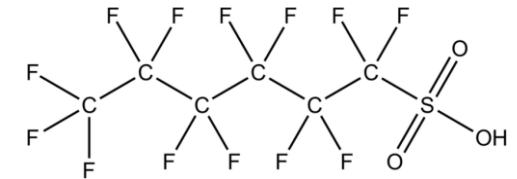
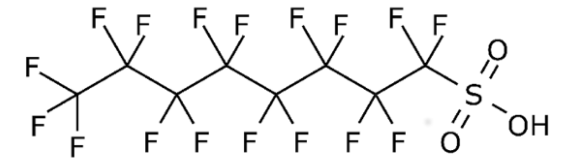
- PFHxA restriction

- "short-chain" PFAS
- Restriction on:
 - Consumer textiles
 - Consumer footwear
 - Paper and board FCM
 - Cosmetics and consumer mixtures
 - Firefighting foams
- Entered into force October 10
 - Transition periods → first provisions will enter into force in 2026



History of PFAS product policy actions: substance per substance approach

- 2006: EU restriction of **PFOS** (under Dangerous Substance Directive)
- 2009: **PFOS** added to the Stockholm Convention on Persistent Organic Pollutants
- 2011: **PFOA** and APFO identified as SVHC + CLP classification
- 2012: ICCM3 identifies PFAS as emerging policy issue
- 2016: **PFNA** identified as Substance of Very High Concern (SVHC) + CLP
- 2017: **PFOA** added to the REACH restriction list (Annex XVII)
- 2017: **PFDA** identified SVHC + CLP
- 2019: **HFPO-DA** (Gen-X) identified SVHC
- 2020: EU PFAS strategy under the Chemical Strategy
- 2020: **PFOA** added to Stockholm Convention
- 2020: **PFBS** identified as SVHC
- 2021: **C9-C14 PFCAs** added to the REACH restriction list (enters into force in 2023)
- 2023: **PFHxS** and related substances will be added to the Stockholm Convention
- 2024: **PFHxA** and related substances have been added to REACH Annex XVII



Well-know PFAS get regulated → lesser known related PFAS replace them
= **regrettable substitution**
→ **Need for a group approach**

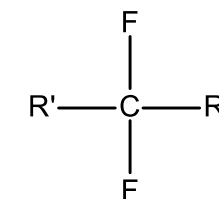
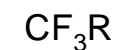
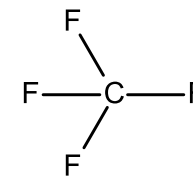
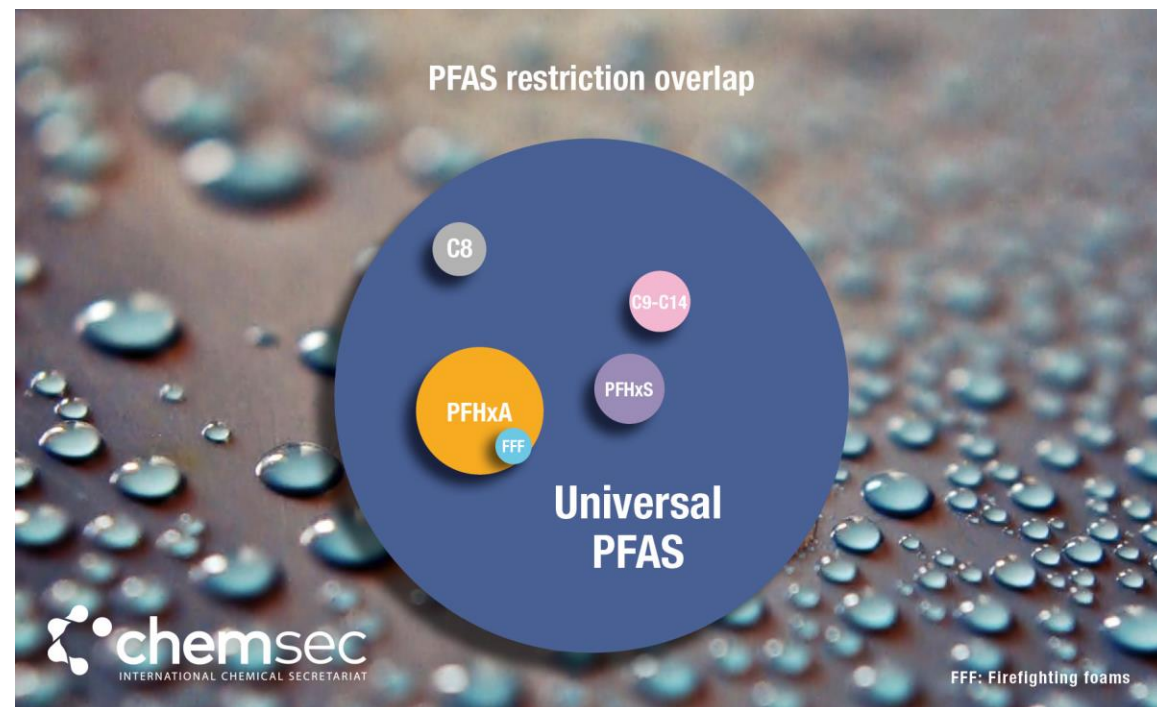
REACH restrictions under development - PFAS in firefighting foams



- Submitted in 2022
- Use of all PFAS in firefighting foams in scope of this restriction
 - Transition periods are likely for specific uses (e.g. use at large industrial installations)
- EU Commission is preparing the restriction proposal
 - Proposal should be first discussed in December 2024
 - Will probably enter into force 2025/2026

REACH restrictions under development – Universal PFAS restriction proposal

- REACH restriction proposal submitted by 4 Member States (NL, DE, SE, DK) and NO in 2023
 - Focus on the entire group of PFAS
 - *"Substances that contain at least one aliphatic -CF₂- or -CF₃ element"*.
 - All PFAS uses are covered in the proposal
 - Specific (temporary) exemptions are proposed for specific uses based on availability of alternatives and whether they are covered in other legislations
 - Proposal still being developed
 - Substantial delays due to the very large scope of the dossier and large number of comments received during public consultation
 - Difficulties on assessing "essential uses" like medicinal products and green technologies
 - Considering current planning the restriction will most likely not enter into force before 2028
- difficult to say what the exact scope will be



How are PFAS regulated

Sectoral and national measures

PFAS challenges for the circular economy and ecodesign

- PFAS used in wide variety of product
 - Contaminate material cycles
 - End up in recycling streams
- Move from plastic to paper and cardboard
 - Chemicals used as coating to ensure oil and water repellency

PACKAGING DIVE Deep Dive Events Press Releases Topics

DEEP DIVE

As PFAS restrictions advance, paper industry struggles to phase out use

The toxic "forever chemicals" have long been used in the packaging sector. While companies say they're being phased out, finding alternatives and eliminating them from effluent remain ongoing issues.

Published April 3, 2023

By April Reese



Paper and bamboo straws contain PFAS chemicals more often than plastic straws do, study finds

Researchers found low concentrations of so-called forever chemicals in various "eco-friendly" straws, raising doubts about whether they're an appropriate alternative.



Of the straws tested in the study, those made of paper were the most likely to contain PFAS. Clare Carrier / Getty Images

Toxic 'forever chemicals' found in toilet paper around the world

Research finds waste flushed down toilets and sent to sewage plants probably responsible for significant source of water pollution



and the world, but it did not name the ck

PPWR – Packaging & Packaging Waste Regulation

- EU rules on packaging and packaging waste, including design and waste management.
- Agreement reached between EU Council and EP in March 2024
- Restriction on presence of PFAS in food and contact packaging has been included
 - All PFAS covered: definition proposed in universal PFAS restriction has been used
- Will be revised in 4 years in case other legislations take measures (REACH, FCM, etc.)

National product policy actions

Denmark



- National ban on PFAS in paper and cardboard food packaging since 2020
- 2024: ban on use of PFAS containing firefighting foams for training and testing
- Recent proposal:
 - ban on PFAS in certain consumer uses (clothing, shoes, etc.)
 - Investments in water and soil purification
 - (bio)monitoring of PFAS in population and environment

France



- Proposal May 2024:
 - Ban on PFAS in cosmetics, ski waxes, clothing and other consumer textiles
 - Monitoring drinking water
 - Reducing industrial emissions
 - Taxation on PFAS emissions
- Note: status of this proposal unclear after elections in France this year

National actions - Belgium

- National Plan on Endocrine Disruptors (NAPED)
 - Research activities on PFAS substances envisaged under this plan
 - Campaign on informing pregnant women on EDs (including some PFAS)
- BBBC
 - Financing substitution projects → PFAS as priority substances
- PFAS financing mechanism
 - Investigation into developing a financing mechanism based on the polluter pays principle
- Actions by regional authorities
 - (bio)monitoring
 - Research and development
 - Mapping of polluted sites
 - Environmental clean-up



.be



Conclusion

Conclusion

- Diverse group of substances + many uses + persistent and hazardous characteristics = PFAS pose a unique and significant concern
- Several product policy actions are and have been taken to tackle these substances, but slow process and regrettable substitution show the need for a group approach
- Delay of group restriction results in sector specific and national actions, but REACH and Stockholm Convention are some of the best tools to ensure broad market and use restrictions considering the EU single market and level playing field for companies
- Other actions like development of alternatives and clean-up technologies remain important to support market bans
 - Especially alternative assessment and concepts like Safe and Sustainable by Design and Essential use can be valuable tools to assist the move away from PFAS

Thank you for your attention!

Any questions?