Status på PFAS begrænsningsforslaget under REACH – for alle anvendelser

”uPFAS”

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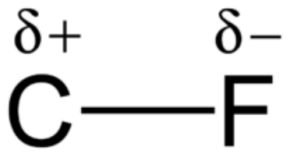
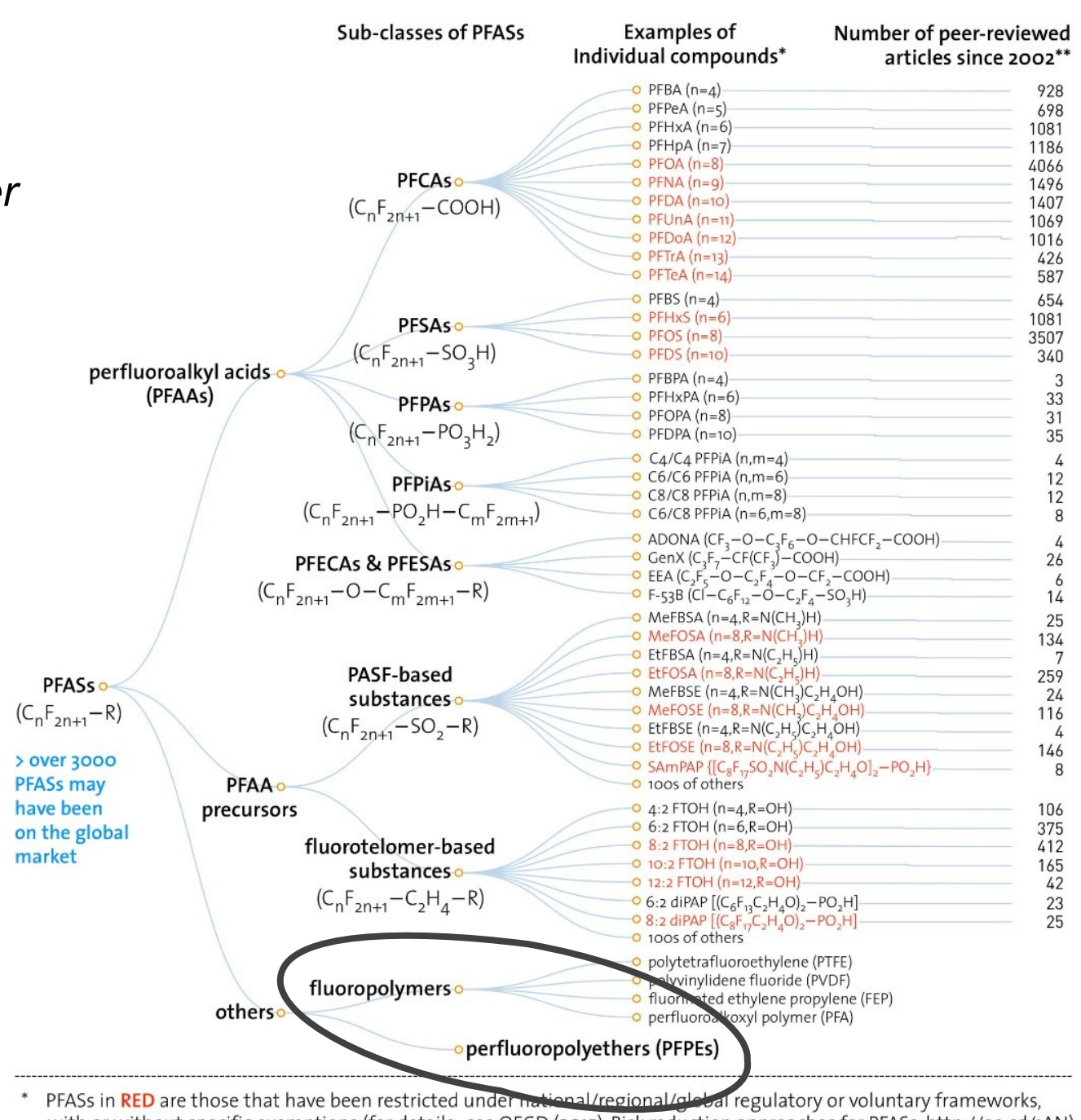
Miljøministeriet
Miljøstyrelsen

PFAS *Per- og polyfluoralkyl stoffer*



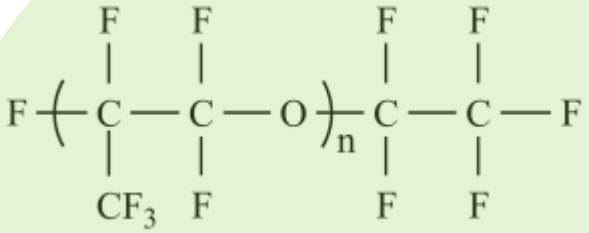
- En familie af syntetisk fremstillede kemikalier
- Estimeret >10.000 enkeltstoffer*
- Markedsført siden 1950'erne
- Svært nedbrydelige i miljøet
- Bioakkumulerer
- Sundhedseffekter bevist siden 1970'erne

**jf. OECD definition 2021*
Illustration (2017): https://pubs.acs.org/doi/10.1021/acs.est.6b04806



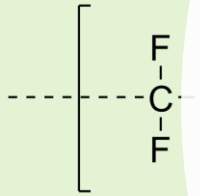
PFAS *Per- og polyfluoralkyl stoffer – Nogle af de mere kendte*

Polymeric

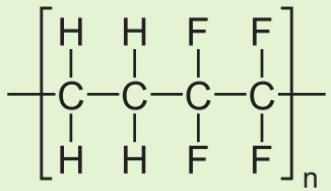


PFPE

PTFE (Teflon)

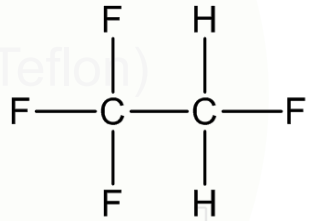


FEP

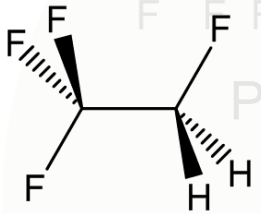


ETFE

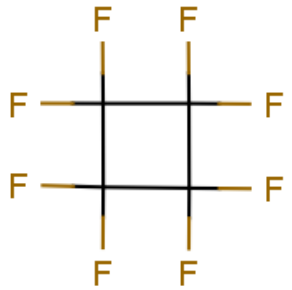
Fluorinated gases



HFC

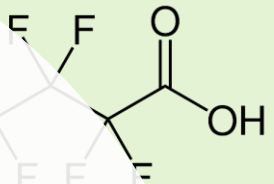


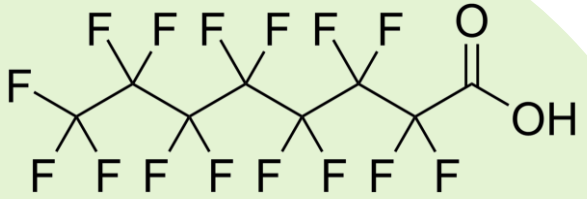
PFHxA



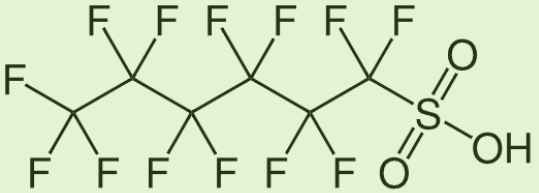
PFC-138

Non-polymeric

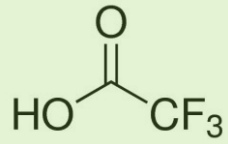




PFOA (C8)

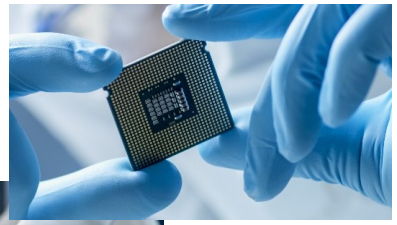


PFHxS



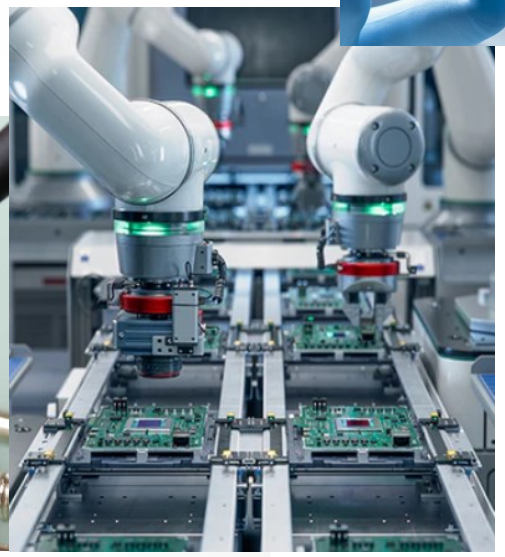
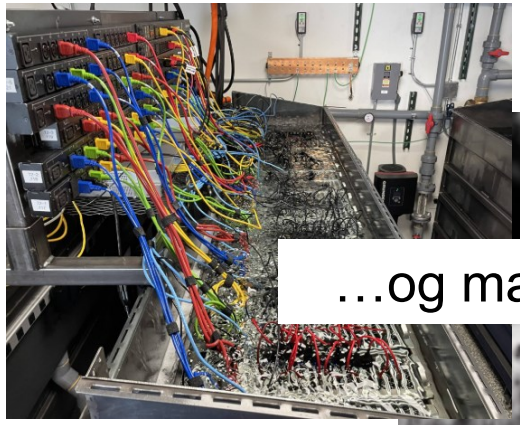
TFA

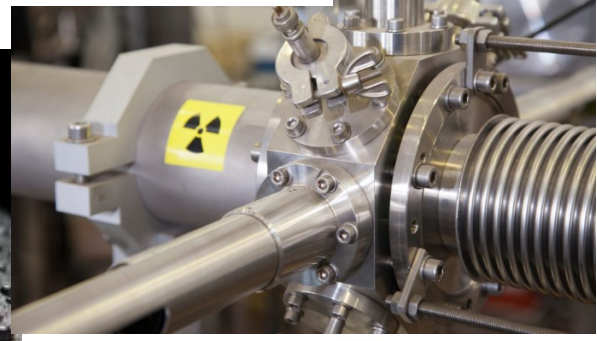


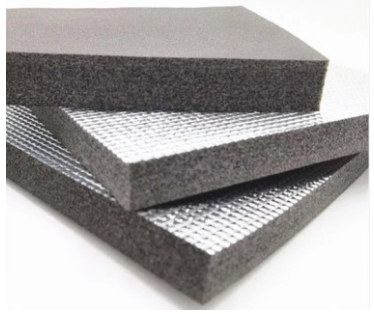


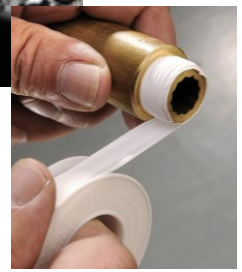









…og mange flere

Miljøministeriet
Miljøstyrelsen

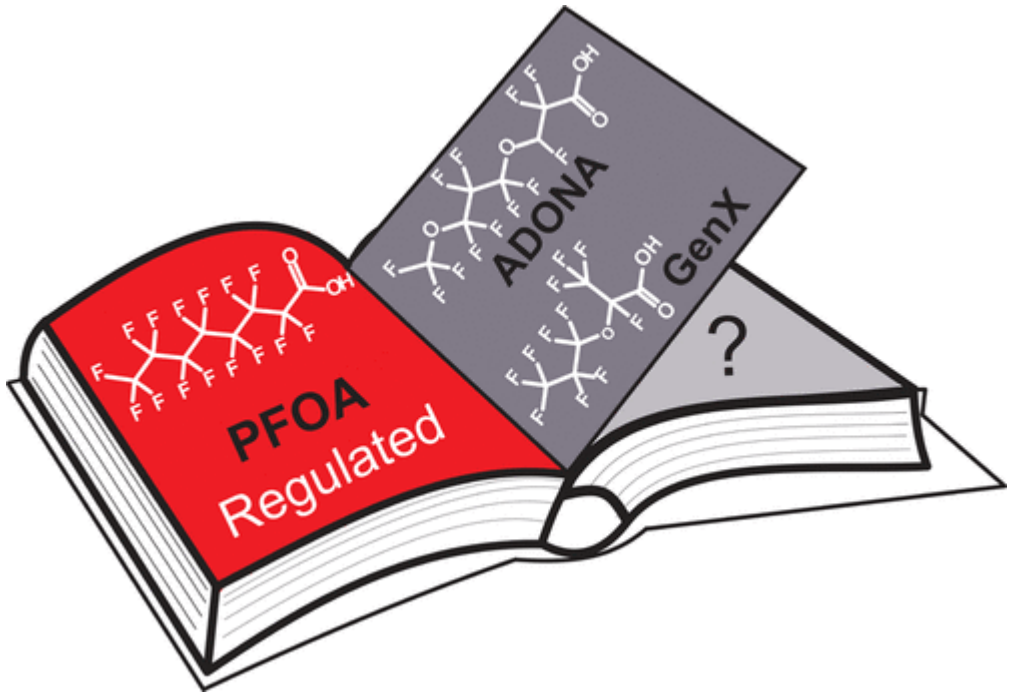


Illustration (2017): https://pubs.acs.org/doi/10.1021/acs.est.6b04806

Miljøministeriet
Miljøstyrelsen

KOM: Europa-Kommissionen

- DG Growth: Generaldirektorat for vækst
- DG Environment: --//-- for miljø

REACH kompetente institutioner i Dossier Submitter (DS) landene:

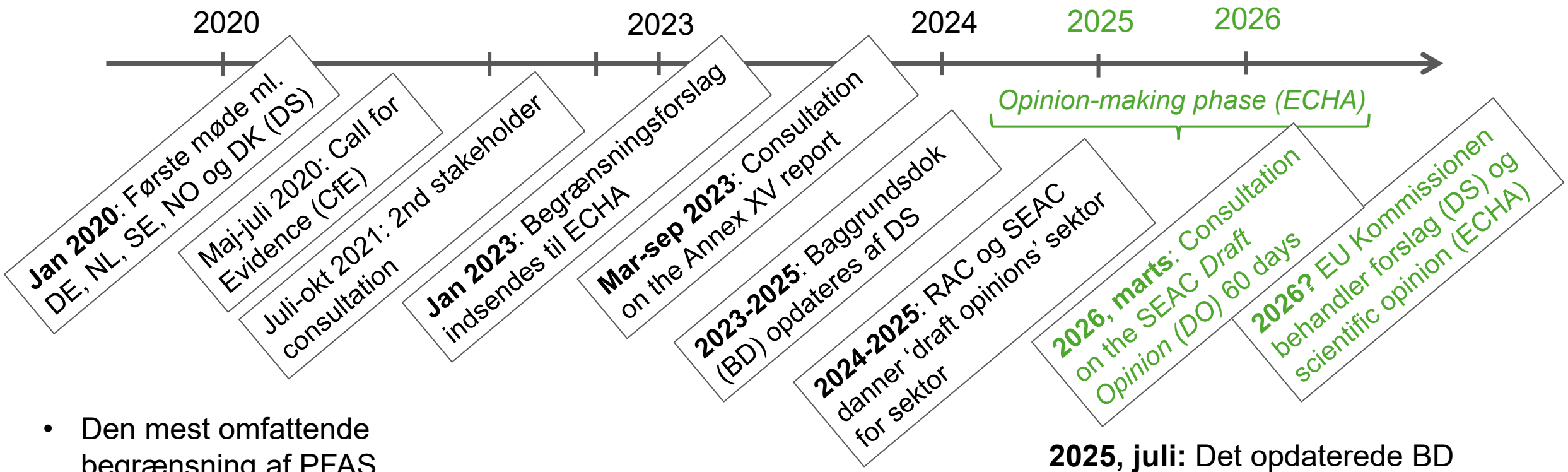
- Rijksinstituut voor Volksgezondheid en Milieu (RIVM)
- Bundesanstalt für Arbeitsshutz under Arbeitsmedizin (BAuA)
  - Bundesstelle für Chemikalien (BfC)
  - Umweltbundesamt (UBA)
- KEMI (SE-EPA)
- Miljødirektoratet (NO-EPA)
- Miljøstyrelsen (DK-EPA)

ECHA: Det Europæiske Kemikalieagentur

- RAC: Komité for risikovurdering
- SEAC: Komité for socioøkonomisk vurdering

Status på ***uPFAS***

8 sektorer tilføjet i det opdaterede BD så i alt 23 sektorer vurderet…



- Den mest omfattende begrænsning af PFAS

2023: Ca. 5.600 høringssvar blev sendt til ECHA

2025, juli: Det opdaterede BD offentliggøres af ECHA
2026 ECHA afleverer *consolidated* opinion til KOM

Miljøministeriet
Miljøstyrelsen

De nye sektorer

Table 4. Tonnages and emissions of major use sectors and manufacture for 2020 (sorted by tonnage range)[a]

Application	Tonnage range	Emission range [%] emitted in manufacturing and use phase	Contribution to total emission
Applications of fluorinated gases	5	3	4
Transport	5	3	4
Construction products	5	3	2
TULAC	5	2	3
Food contact materials and packaging	5	2	1
Manufacture	5	1	1
Sealing applications	5	1	1
Electronics and semiconductors	5	1	1
Other medical applications	4	4	2
Medical devices	4	3	3
Lubricants	4	2	2
Technical textiles	4	2	1
Military applications	4	2	1
Broader industrial uses	4	2	1
Energy sector	4	1	1
Cosmetics	3	2	1
Explosives	3	2	1
Metal plating and manufacture of metal products	3	1	1
Machinery applications	3	1	1
Printing applications	3	1	1
Consumer mixtures and miscellaneous consumer articles	2	3	1
Ski wax	1	3	1
Petroleum and mining	1	2	1

Table legend

Tonnage range [t/y]		Emission range [%]		Emission contribution [%]	
1	0 – 10	1	0 – 5	1	0 – 1
2	10 – 100	2	5 – 25	2	1 – 5
3	100 – 1 000	3	25 – 75	3	5 – 10
4	1 000 – 10 000	4	75 – 95	4	10 – 50
5	>10 000	5	>95	5	>10 – 50

[a] Military applications reported for the sake of completeness, but not included when calculating totals to avoid double counting as the uses are already covered in other sectors.

+ ”horizontal topics” såsom **genbrug** (”second-hand market”), **genanvendelse** (”recycling”) og **reservedele** (”spare parts”) med flere…

Kilde: Main report, BD
https://echa.europa.eu/documents/10162/cd583492-f5d4-e2e7-9938-a1d602084c72

uPFAS kort fortalt

Begrundelse for EU-forslag

- Baseline uden regulatorisk indgreb – over 30-årig periode i EEA:
  - Totale volumen af PFAS estimeret til 27 mio. ton.
  - Totale udledning estimeret til 4,7 mio. ton over hele livscyklus.
  - Anvendelse og dermed udledning forventes at stige, hvis ikke der indføres regulering.
- Risikoen ved PFAS er ikke tilstrækkeligt kontrolleret.
  - Ved at definere PFAS iht. OECD (10.000 stoffer) undgås at ”gamle”/kendte PFAS udskiftes med ”nye” PFAS. Fluorpolymerer nedbrydes til meget persistente PFAS.

Begrænsningsscenarier (*Restriction Options*) som vurderes ift. proportionalitet:

- **RO1** Fuldt forbud efter 18 måneders overgangsperiode
- **RO2** Forbud med tidsbegrænsede undtagelser for anvendelser med tilstrækkelig evidens for, at alternativer ikke er tilgængelige ved EiF (*Entry into Force*).
  - Enten 18 måneder + 5 år = 6,5 års overgangsperiode fra EiF
  - Eller 18 måneder + 12 år = 13,5 års overgangsperiode fra EiF
- **RO3** Fortsat anvendelse af PFAS under forudsætning af at lave emissions-grænseværdier overholdes eller andre tiltag for begrænsning af udledning implementeres.

Alle baggrundsdokumenter: https://echa.europa.eu/da/registry-of-restriction-intentions/-/dislist/details/0b0236e18663449b. ***OBS! De opdaterede annexer nederst på siden!***

uPFAS kort fortalt

Hvad indgår i vurderingen af proportionalitet?

- Anvendelser, tonnager/volumen → **Annex A**
- Emissioner i de forskellige faser af livcyklus → **Annex B**
- Relateret lovgivning/snitflader, Availability of Alternatives (AoA), socio-økonomiske vurderinger inkl. vækstrate for forbrug af PFAS, proportionalitet og konsekvenser for de forskellige Restriction Options → **Annex E**

mm….

Effectiveness: emission reduction [%]	Costs				
	Very low	Low	Moderate	High	Very high
Very Low (<70%)	Not effective enough to achieve the desired minimum effectiveness level				
Low (70 – 79%)					
Moderate (80 –89%)					
High (90 - 98%)					
Very high (≥99%)					Very effective, very high costs

Alle baggrundsdokumenter: https://echa.europa.eu/da/registry-of-restriction-intentions/-/dislist/details/0b0236e18663449b. ***OBS! De opdaterede annexer nederst på siden!***

Forslag ift. PFAS i **byggematerialer**

Miljøministeriet
Miljøstyrelsen

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Manufacture	5	1	1
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Technical textiles	4	2	1
Military applications	4	2	1
Broader industrial uses	4	2	1
Energy sector	4	1	1
Cosmetics	3	2	1
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Table legend

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4	1 000 – 10 000	4	75 – 95	4	10 – 50
5	>10 000	5	>95	5	>10 – 50

[a] Military applications reported for the sake of completeness, but not included when calculating totals to avoid double counting as the uses are already covered in other sectors.

Kilde: Main report, BD
https://echa.europa.eu/documents/10162/cd583492-f5d4-e2e7-9938-a1d602084c72

Miljøministeriet
Miljøstyrelsen

Forslag ift. PFAS i **byggematerialer**

- Totale **volumen** ca. 790.000 ton over 30-årig periode
  - Annex A: https://echa.europa.eu/documents/10162/fa1da389-836f-6eb3-e2c4-da9c53eb7516

- Totale **udledning** ca. 242.000 ton over 30-årig periode
  - Annex B: https://echa.europa.eu/documents/10162/8dc22213-c879-c550-9b67-9ab2067af54e

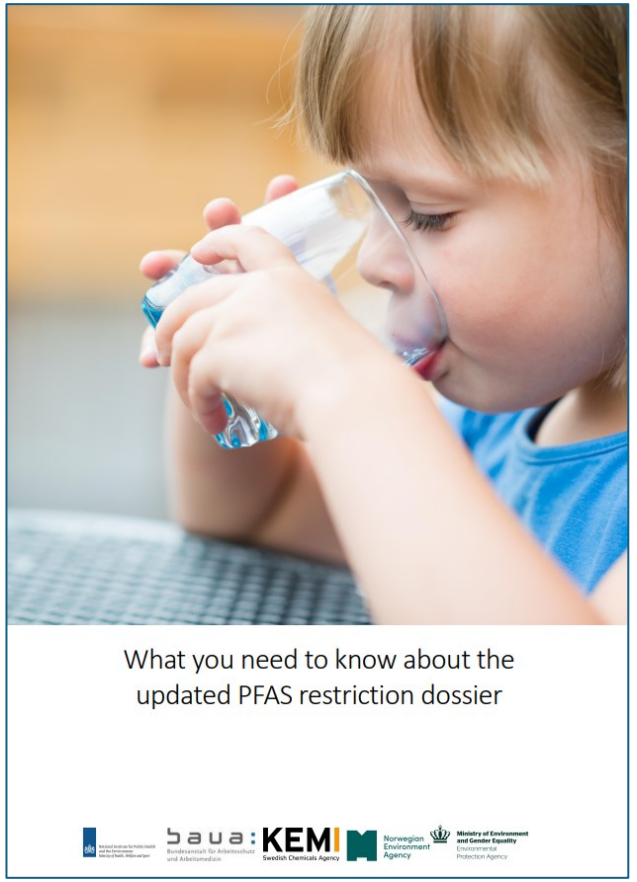
- "Sufficiently **strong evidence of low substitution potential"** for "polymer additives used for fire safety purposes in construction products" and "bridge bearings" = Ingen alternativer pt. → RO2
- **RO2 vurderes proportional**, da **udledningen reduceres ca. 95%** og de samfundsøkonomiske konsekvenser er moderate.
  - Annex E: https://echa.europa.eu/documents/10162/ce7fecd8-d080-656c-079a-7b0b2a1dcd67

- Derogation 5.z.: "**polymer additives used for fire safety purposes in construction products** until 13.5 years after EiF"
- Derogation 6.o.: "**bridge and building bearings** until 13.5 years after EiF"
  - Main report: https://echa.europa.eu/documents/10162/cd583492-f5d4-e2e7-9938-a1d602084c72

Alle baggrundsdokumenter: https://echa.europa.eu/da/registry-of-restriction-intentions/-/dislist/details/0b0236e18663449b. ***OBS! De opdaterede annexer nederst på siden!***

Diverse links

- Summary of BD **”What you need to know about the updated PFAS restriction dossier”**: https://mst.dk/nyheder/2025/oktober/pfas-omfattende-eu-forslag-forklaret-paa-20-sider
- Nyheder fra ECHA om uPFAS: https://echa.europa.eu/da/hot-topics/perfluoroalkyl-chemicals-pfas
- Er det PFAS? Tjek PRIO databasen: https://www.kemi.se/prioguiden/english/search?tab=advancedSearch
- Hvordan analyseres produkter for PFAS-indhold? Artikel fra august 2024: https://pubs.acs.org/doi/10.1021/acs.est.4c06570
- Alternativer til PFAS? Tjek Chemsec-databasen ‘Marketplace’: https://marketplace.chemsec.org/Alternatives/



Uddannelse
Regelmæssige kurser for medlemmer og leverandører

Netværk
Videns- og erfaringsdeling

Miljøstyrelsens PFAS-partnerskab for erhvervslivet

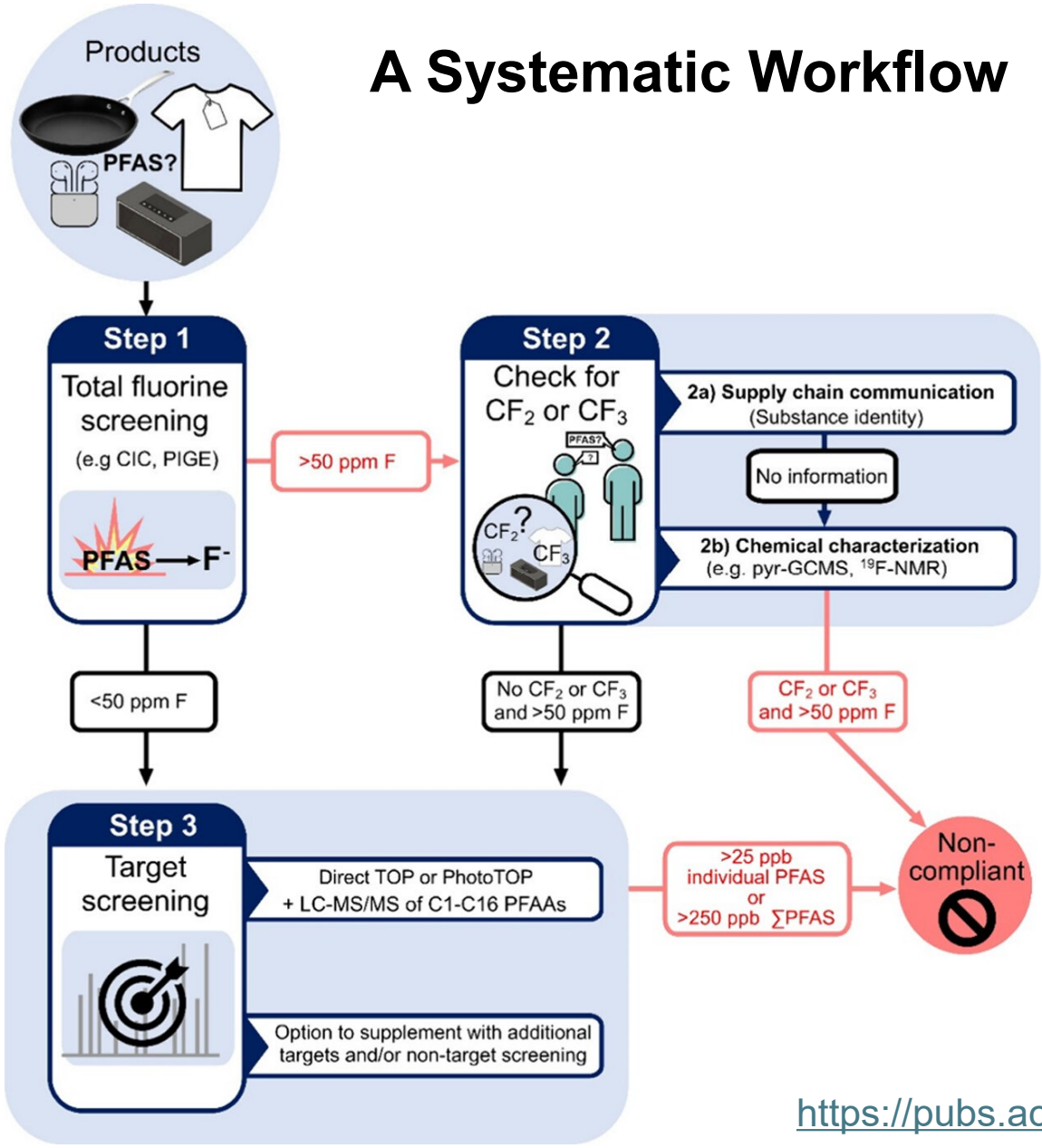
Task-forces Grundlæg
Intern kommunikation, brugs kategorier, ensartet sprog, impact assessment

Task-forces Udvikling
Case studies, tilgængelige alternativer, PFAS i produktion og produkter

Webinar: https://www.youtube.com/watch?v=UXUkmS51rwU

Tak for opmærksomheden

A Systematic Workflow



https://pubs.acs.org/doi/10.1021/acs.est.4c06570

PFAS manufacturing

- Manufacture of PFASs in the EU from raw materials like monomers or starting compounds
- Does not include formulation of PFAS containing mixtures or production of articles

Cross-cutting assessments

- Second-hand market.
- Spare parts for complex objects already in end use.
- Secondary (recycled) materials (e.g., paper, plastics and textiles).
- Scientific research & development (SR&D).
- Product & process-oriented research & development (PPORD).

PFAS uses outside of assessment scope

- Active substances in medicinal products for human & veterinary use.
- Active substances in PPP & biocides.

Overarching (generic) applications of PFASs

- Electronics and semiconductors – *wires/cables; electrical and photonic components (inc. data storage); semiconductor manufacturing processes; heat transfer/management fluids.*
- Lubricants – *mixtures for low-viscosity lubrication, greases, solid/dry films (e.g., piston-rings) and slip/release agents – including in sealed articles/objects*
- Sealing applications* – *fluoropolymers and perfluoropolyethers used (i) to prevent leakage (ii) to contain pressures (iii) to exclude contamination (e.g., o-rings, gaskets, pipes & tubing)*
- Machinery applications* – *fluoropolymers and perfluoropolyethers used (i) for self-lubricating (low friction) parts (ii) as structural elements (iii) as coatings for protection/durability*

Sector-specific applications of PFASs (overarching applications of PFASs and PFAS manufacturing are not within the scope of sector-specific assessments)

Consumer mixtures & miscellaneous consumer articles

- *Uses in scope*: eyewear anti-fog; musical strings; fishing lines; synthetic turf
- *Related uses in other sectors*: home textile treatments; razor blade coatings.

Cosmetics

- *Uses in scope*: PFAS ingredients in cosmetic products; PFASs used to manufacture cosmetic ingredients (e.g., peptide synthesis).
- *Related uses in other sectors*: manufacturing equipment; product packaging.

Ski wax

- *Uses in scope*: formulation & use of ski waxes.

Medical devices

- *Uses in scope*: implantable, invasive & other medical devices (e.g., wound treatment, sterilisation gases); sterile & non-sterile medical device packaging.
- *Related uses in other sectors*: excipients, immediate packaging, medicinal product packaging, drug delivery devices, medical textiles & venting, PPE, IVDs.

Other medical applications*

- *Uses in scope*: excipients, immediate packaging, drug delivery devices e.g., metered-dose inhalers (MDIs), pre-filled syringes, injection pens.

TULAC (textiles, leather, upholstery, apparel, carpets)

- *Uses in scope*: home textiles and treatment agents (e.g., carpets/upholstery); consumer and professional apparel; PPE; leather.
- *Related uses in other sectors*: packaging, optical fibres, printing inks, t… textiles, dry cleaning of textiles.

Petroleum & mining

- *Uses in scope*: anti-foaming agents, tracers, wetting agents, foam stabilisers.
- *Related uses in other sectors*: Industrial automation/monitoring/control (IAMC).

Energy

- *Uses in scope*: wind turbines, solar panels, batteries, switchgear, hydrogen fuel cells & electrolysers.
- *Related uses in other sectors*: oil & gas, hydropower, battery vents, hydrogen storage, solid-oxide fuel cells, IAMC.

Construction products

- *Uses in scope*: Architectural coatings, paints & adhesives, greenhouse roofing, coil coated materials, anti-drip polymer additives, polymer processing aids, window frames, plumbing, bridge & building bearings.
- *Related uses in other sectors*: architectural & weatherproofing membranes, foam blowing agents (foam insulation), plain bearings for non-building applications, cable/wire insultation, metal plating & coil coating processes.

Metal plating & manufacture of metal products

- *Uses in scope*: wetting agents & mist-suppressants, production of coated metal articles/objects, razor blade coatings.
- *Related uses in other sectors*: downstream use of coated metal products.

Transport

- *Uses in scope*: automotive, aerospace, watercraft, rail, agricultural, forestry, construction and industrial vehicles; mobile air conditioning (MAC) & heat pumps; transport refrigeration; reflective signage.
- *Related uses in other sectors*: batteries & fuel cells, textiles in vehicles, PPE, aircraft fire-extinguishers, pyrotechnic charges (e.g., airbags).
- *Related uses in other sectors*: greenhouse roofing, medical devices, fuel cells, TULAC, printing inks, solvents for dry cleaning.

Broader industrial uses*

- *In scope*: catalysts and processing aids (e.g., ionic liquids), solvents (for cleaning or extraction), hydraulic fluids
- *Related uses in other sectors*: metal plating; anti-acid coatings; hydraulic fluids in vehicles.

Fluorinated gases

- *In scope*: heating, ventilation, air-conditioning & refrigeration (HVACR); foam blowing agents (foam insultation); propellants; clean-fire suppression; cover gases, insulating gases in electrical equipment, paper preservation.
- *Related uses in other sectors*: metered dose inhalers (MDIs), MAC, transport refrigeration, immersion cooling of electronic equipment.

Food contact materials (FCMs) & packaging

- *In scope*: consumer and industrial cookware, packaging for oil/grease resistance & water repellence (baking paper/vehicle wraps), polymer processing aids for plastic film production, printing inks & lacquers for FCMs.
- *Related uses in other sectors*: medicine/medical device packaging, water treatment membranes.

Printing*

- *In scope*: consumables (e.g., toners, latex printing inks, PTFE wax/powder), photosensitive materials, surfactants, permanent parts (e.g., plates and rollers)
- *Related uses in other sectors*: printing inks & lacquers for FCMs

Explosives*

- *Related uses in other sectors*: military explosives, non-military HVACR, military textiles, military PPE, uniforms and protective apparel.

Kilde: ”What you need to know about the updated PFAS restriction dossier”: https://mst.dk/nyheder/2025/oktober/pfas-omfattende-eu-forslag-forklaret-paa-20-sider