



# PFAS and Risk Assessment

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# PFAS risk assessment in the EU

**A global ban for all PFAS substances has been proposed  
– the risk assessment is needed for justifying it**

For the risk assessment you need to know:

- ✓ Uses and exposure
- ✓ Environmental fate
- ✓ Health impacts

# PFAS Risk assessment: Uses and exposure

PFAS can provide

- ✓ Resistance to radiation, weathering, temperatures, corrosion
- ✓ Repellence to oil, water and stains
- ✓ Chemical and electrical inertness

Professional uses:

firefighting foams, paints and photography, chrome plating, pesticides, hydraulic fluids, refrigeration

Consumer (and professional) use:

non-stick frying pans, food packaging, cosmetics, textiles for furniture and outdoor clothing, ski waxes, pharmaceuticals



# PFAS Risk assessment: Uses and exposure

## Forerunner companies are looking for safer chemicals for substitution

However, other companies are substituting restricted chemicals with other PFAS that have not yet been banned.

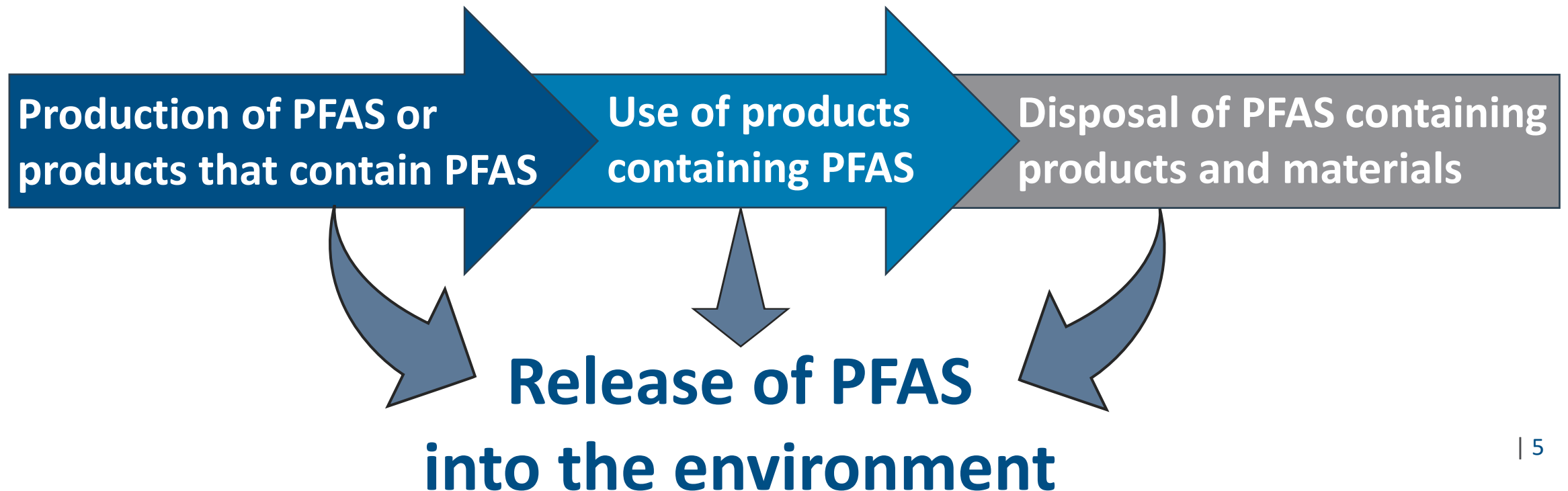
5600 comments to PFAS restriction proposal – particularly strong lobbying for excluding PFAS polymers, like Teflon

Without restriction ECHA has estimated an annual increase in use of PFAS between 0-10% depending on substance and use

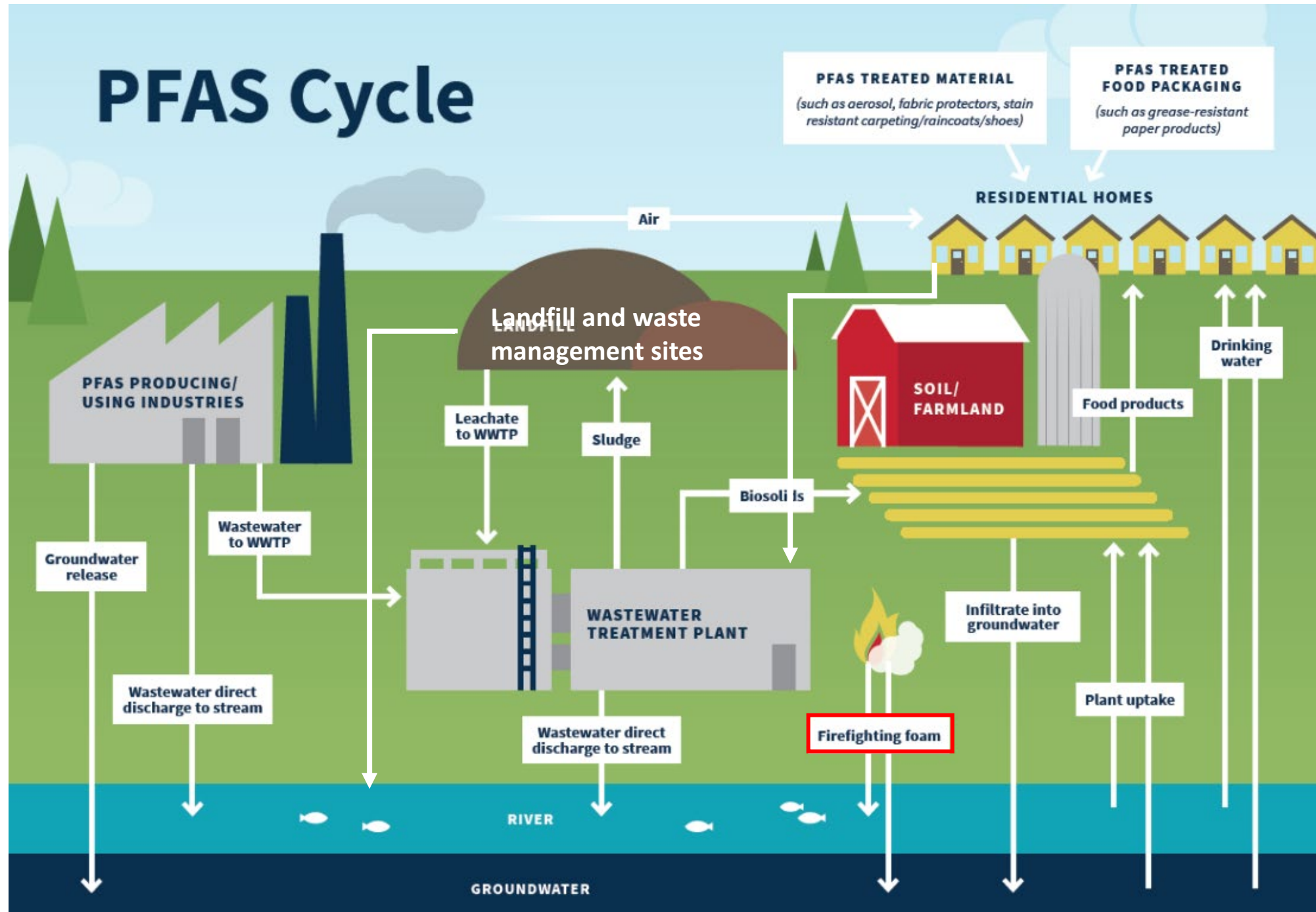


# PFAS Risk assessment: Uses and exposure

PFAS can be released to the environment during the production, use and disposal phase of products



# PFAS Cycle



Source: Modified from ECHA 2024 Restriction report, original source Helmer et al. 2022

# PFAS Risk assessment: Uses and exposure

## PFAS exposure can happen through

- Eating and drinking contaminated food and water (or breast milk)
- By inhaling volatile PFAS in the air or dust containing PFAS (e.g. house dust)
- Through the skin

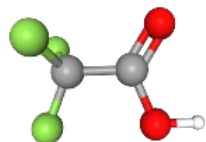


**Highest serum PFAS levels have been found in populations living near hotspots and some workers exposed to PFAS.**

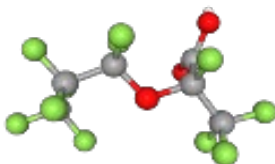
**In Northern and Western Europe 24% of the teenagers had levels above which health effects cannot be excluded.**

# PFAS Risk assessment: Environmental fate

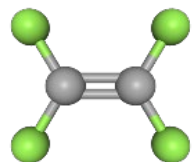
There are thousands of different PFAS compounds that have different environmental behavior



TFA



GenX



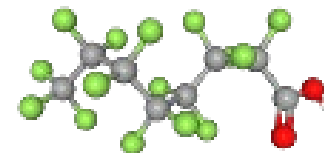
Tetrafluoroethylene

Volatility

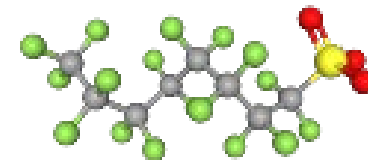
Water solubility

Adsorption

Degradation, Transformation



PFOA



PFOS

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# PFAS Risk assessment: Environmental fate

## PFAS can be found everywhere in our environment

- Main concerns related to PFAS is their extreme persistence in the environment
  - PFAS can magnify in the food chain
  - PFAS can be found in soil, sea, rainwater, biota and human blood



# PFAS Risk assessment: Health effects

## High certainty risks:

- Reduced response to vaccines
- Increased cholesterol levels
- Interference with the development of fetuses and children
- Thyroid disease
- Liver damage
- Testicular and kidney cancer

**Many knowledge gaps:**

**Other effects? Mixture effects? Mechanisms?  
Short chain compounds?**



# PFAS Risk assessment: Summary

## PFAS properties

Very high persistence

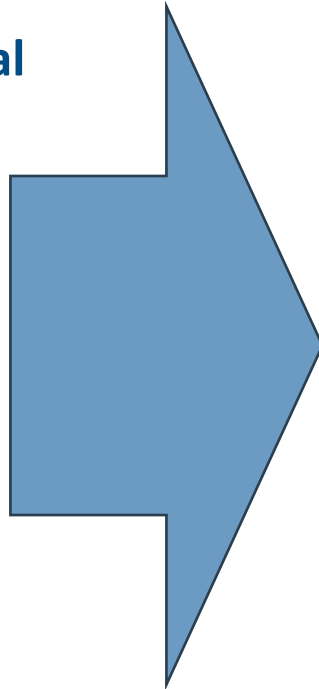
Long-range transport potential

Mobility

Accumulation in plants and food chain

Effects on human health and biota

Endocrine activity



## PFAS risks

High potential for ubiquitous, increasing and irreversible exposures of the environment and humans

Difficulty to decontaminate water and to reduce emissions with site-specific risk management

High potential human exposure via food and drinking water

Potential for intergenerational effects and delay of effects

Potential for causing serious effects although those would not be observed in standard tests

Estimation of future exposure levels and safe concentration limits is highly uncertain

Global warming potential (fluorinated gases)

# What are the risks at the level of local communities?

**In numerous cases around the world the PFAS pollution has gone unnoticed for a long time...**

Some examples close by:

- In Sweden several cases where drinking water pollution has been found randomly and the citizens had been exposed to PFAS for years
- In Finland fisherman eating fish from a polluted river had extremely high levels of PFAS in the blood
- High levels of PFAS were found in eggs due to the use of fishmeal for feeding the chicken





# What can the municipality do?

## Actions for protecting the citizens and the environment

- Hot spot mapping, risk assessment and remediation if necessary
- Get information on the PFAS levels in drinking water and wastewater – get prepared for the upcoming regulations
- Inform citizens
- Minimise the use of PFAS in the municipality
  - Rescue services
  - Airports
  - Public procurement

# What is the role of the municipality?

**It is the local authorities, cities and water utilities that need to turn most regulations into action**

- This requires a considerable amount of know-how and expertise
- The resources are scarce – it is important to be able to prioritise and make wise decisions on actions
- EMPEREST aims at providing training and tools!





# THANK YOU

**Interreg**  
Baltic Sea Region



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