Be restrictive with derogations for uses of PFAS in the new EU-ban

Recommendations

- Only allow time-limited derogations for PFAS uses where no viable alternatives exist and only to uses essential to health, safety, or the functioning of society. Derogations should be clearly defined and only allow sufficient time to transition to safer alternatives.
- Don't grant time-unlimited derogations, such as for manufacturing of PFAS, since emission controls can never fully prevent PFAS from entering the environment and posing risks to human health. Also, exported PFAS, being highly persistent and mobile, will return via atmosphere and oceans and in imported products and articles.
- Provide continued funding and support for research and development of safer alternatives and technologies to remediate PFAS from contaminated water and soil.

An ambitious EU-ban on PFAS will be an important step toward a cleaner and safer EU and is likely to have an impact of the use of PFAS worldwide. To be truly effective, however, it's important that derogations are limited in time and scope and provided only to uses where there are no viable alternatives. As PFAS will contaminate the environment for decades, it is important to provide funding and support for research and development of safer alternatives and technologies to remediate PFAS from contaminated water and soil.

Although industrial scientists were aware of widespread human exposure to PFAS already in the 1980s, manufacturers withheld this information, and awareness within the wider scientific community only grew in the early 2000s. Since then, some PFAS (such as PFOS, listed under the Stockholm Convention since 2009) and certain uses (such as food packing materials and firefighting foams) have been regulated at EU or national level. However, PFAS comprise thousands of substances with similar extreme persistence, making substance-by-substance regulation both impractical and ineffective. A class-based approach is therefore essential to ensure comprehensive protection for health and the environment and to prevent regrettable substitutions.

In 2015, a group of scientists proposed a global PFAS-group ban in the Madrid statement.[1] The EU adopted this group approach as part of its *Chemicals Strategy for Sustainability* in 2020. Early in 2023 five European states (Sweden, Norway, Denmark, Germany and the Netherlands) jointly submitted a PFAS restriction proposal to the European Chemicals Agency (ECHA) under the chemicals regulation REACH. Following a public consultation, a revised proposal was released in August 2025.

The proposal introduces an EU-wide ban on all PFAS across 23 sectors, however, with both time-limited derogations for many uses and time-unlimited derogations for several sectors as well as for manufacturing of PFAS.

Following a public consultation, a revised proposal was released in August 2025.

[1] A.Blum et al, 2015. The Madrid Statement on Poly- and Perfluoroalkyl Substances (PFASs)

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Following an evaluation by ECHA's scientific committees for Risk Assessment (RAC) and Socio-Economic Analysis (SEAC), the European Commission will decide on the restriction in consultation with EU Member States.

What are PFAS? (box)

PFAS – per- and polyfluoroalkyl substances – is an umbrella term for over 10,000 man-made chemicals.

The Organization for Economic Co-operation and Development (OECD), defines them as substances containing at least one fully fluorinated methyl (-CF_3) or methylene (-CF_2-) carbon atom, without any hydrogen, chlorine, bromine, or iodine atom attached to it. Independent researchers have confirmed that this definition is scientifically grounded, unambiguous, and well suited to identify them. [2]

PFAS exist as solids, liquids, and gases and encompass a vast diversity of chemical structures, leading to differences in toxicity and bioaccumulation. However, they all share one critical characteristic: extreme persistence. Therefore, they do not degrade in nature but can transform into other PFAS (e.g., trifluoroacetic acid (TFA)), which remain highly persistent and accumulate in the environment.

Certain PFAS are known to cause adverse health effects, including increased cholesterol, liver damage, immune system impacts, reduced fertility, pregnancy-related complications, and elevated risk of kidney and testicular cancer. Given the vast number of PFAS, only a small fraction has undergone comprehensive risk assessment.

PFAS owe their widespread industrial use to unique properties such as exceptional resistance to heat and chemicals, water and oil repellency, low surface energy, and long-term durability. These characteristics enable a wide range of consumer and industrial applications ranging from non-stick cookware and waterproof textiles to grease-resistant packaging, high-performance electronics, medical devices and firefighting foams.

Widespread contamination and human exposure

PFAS enter the environment through emissions during production, product use and disposal of PFAS-products (including from landfill leachate and wastewater discharges). Hotspots are often associated with fluoropolymer manufacturing and fire training facilities. In Europe alone, 23,000 PFAS-contaminated sites have been identified,[3] with many more suspected.

[2] Scientists' Statement on the Chemical Definition of PFASs | Environmental Science & Technology Letters

[3] The Map of Forever Pollution - The Forever Pollution Project

PFAS can also travel through the atmosphere, and have even been found in Arctic ice and soil, despite the long distance to emission sources.[4] A study on rainwater showed that the concentration of $\sum_4$PFAS (the sum of four PFAS) in rainwater often exceeds strict drinking water limit values.[5]

Also, the ocean can act as a secondary source of PFAS when aerosols, formed when PFAS-enriched bubbles burst after waves break, carrying PFAS into the atmosphere and onto land.[6]

Human exposure mainly occurs through ingestion of food, drinking water and dust, inhalation of air, contact with consumer products and occupational exposure.[11] In contamination hotspots, such as Ronneby and Kallinge in southern Sweden, serum levels of PFAS in humans has shown to exceed health-based guidance values.

Derogations should be well defined and time-limited

While the EU ban on PFAS could be an important step towards reducing PFAS contamination and exposure, it is crucial that the derogations are not too extensive.

The proposal states that for more than 80 uses of PFAS, the plausible alternatives are not yet readily available, and for this reason time-limited derogations from 5 to 12 years are proposed for these uses. It is important that these derogations are precisely defined and limited to certain uses and substances, as non-specific derogations risk creating years of uncertainties and counteracting interpretations.

When it comes to environmental regulation several studies have shown that the costs of action are often overestimated, while the costs of inaction are underestimated.[7,8]

Evaluations of comparable regulatory processes also show that companies typically adapt more quickly and at lower cost than anticipated when clear rules and timelines are established.[9] Hence, the number of derogations and the time limits should be kept as low as possible. One way of keeping the number of derogations low is to only grant derogations for uses that are proven to be essential for health, safety or for the functioning of society. [10]

If limited data exist to sufficiently evaluate uses and alternatives to PFAS in certain sectors, derogations should by default not be granted.

In addition to the suggested time-limited derogations, the proposal contains options for time-unlimited derogations and the continued use of PFAS under controlled conditions in seven sectors such as transport and energy. Within these sectors, a ban was deemed disproportionate after weighing up the benefits of risk minimisation against the socio-economic consequences.

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[4] Change in global PFAS cycling as a response of permafrost degradation to climate change - ScienceDirect

[5] Outside the Safe Operating Space of a New Planetary Boundary for Per- and Polyfluoroalkyl Substances (PFAS) | Environmental Science & Technology

[6] B Sha et al, 2022. Sea Spray Aerosol (SSA) as a Source of Perfluoroalkyl Acids (PFAAs) to the Atmosphere: Field Evidence from Long-Term Air Monitoring

[7] Andersen & Clubb, 2013. Understanding and accounting for the costs of inaction, in; Late Lessons from Early Warnings; science, precaution, innovation, European Environmental Agency.

[8] R. Vanner and P. Ekins, 2006. Ex-post estimates of costs to business of EU environmental policies: A case study looking at Ozone Depleting Substances.

[99] ChemSec, 2015. Cry wolf, predicted costs by industry in the face of new environmental regulations

[10] I. Cousins et al, 2019. The concept of essential use for determining when uses of PFASs can be phased out

Also, manufacturing of PFAS, with strict emission controls, is proposed to be continously allowed to prevent a shortage of materials necessary for the uses for which time-limited derogations are proposed, and also to enable the export of PFAS from the EU. The evidence of impacts from PFAS manufacturing sites at both local and global scales is, however, compelling.

Emission controls will never be able to fully stop PFAS from entering the environment and eventually human bodies, and exported PFAS will return to Europe through air and water. All time-unlimited derogations should therefore be avoided.

The bulk of PFAS – fluoropolymers and fluorinated gases

Polymeric PFAS (mainly fluoropolymers) and fluorinated gases are the PFAS groups with the highest volume use in the European Economic Area.[11] It is therefore not surprising that their proposed inclusion in the ban has sparked much debate.

Fluoropolymers are high-molecular-weight PFAS polymers used primarily in industrial applications, and in some consumer products. Unlike smaller PFAS, they behave as stable plastic-like materials, are not bioaccumulative, and are generally considered to have low toxicity. However, their life cycle remains problematic as the manufacturing results in large emissions of fluorinated gases, processing aids as well as multiple by-products, and their waste management and recycling processes are associated with major knowledge gaps and environmental concern. [12]

Fluorinated gases are most commonly used in heat pumps, air conditioning, commercial refrigeration and as foam-blowing agents for insulation materials. While many of the refrigeration systems are designed to be sealed, leaks occur during transport, installation, maintenance and disposal. Some fluorinated gases are are already regulated due to their ozone-depleting effects or high global warming potential. However, most fluorinated gases are not yet regulated and it is important that the EU ban om PFAS include these substances, as proposed.

The poster child of persistence – TFA

TFA (trifluoroacetic acid) is the smallest PFAS and a common degradation product of other PFAS, including certain fluorinated gases and pesticides. Until recently, TFA has not be considered very toxic. However, the German Environment Agency has recently submitted a dossier to ECHA with evidence that TFA is toxic to reproduction.[13]

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[11] Swedish Chemical Agency, October 2025. What you need to know about the updated PFAS restriction dossier

[12] The universe of fluorinated polymers and polymeric substances and potential environmental impacts and concerns - ScienceDirect

[13] Germany May 2025 proposed to ECHA to classify TFA as toxic for reproduction (Repro 1B) as well as very persistent and very mobile (PMT/vPvP). https://www.umweltbundesamt.de/presse/pressemitteilungen/trifluoressigsaeure-tfa-bewertung-fuer-einstufung

Environmental levels of TFA are rapidly increasing across multiple matrixes in the environment, including plants, groundwater, food and human blood.[14] Its small molecular size makes TFA difficult and extremely costly to remove from wastewater or the environment.

History has repeatedly shown that persistence is a key driver for environmental contamination as seen with substances such as dichlorodiphenyltrichloroethane (DDT) and polychlorinated biphenyls (PCBs). Even though they have been banned for decades, these chemicals continue to pollute the environment, contaminating our food and harm wildlife. Without an ambitious PFAS-ban, TFA risks becoming the next long-term contaminant under our watch.

Many companies will benefit

A clear and ambitious legislation, without broad derogations and loopholes, will benefit companies that have already transitioned away from PFAS, and stimulate further innovation and development within the industry.

Studies show that companies resistant to regulatory change are often more vocal in policy debates, which can mislead policymakers into thinking they are helping the broader industry, when in fact they may disadvantage more progressive companies.[15]

This dynamic is likely the case also for PFAS, where forward-looking companies have already developed alternatives for many applications.[16,17] Such alternatives include not only chemical substitutes but also material innovations, process changes, and new technologies which are often both safer and more sustainable.[18,1] However, continued and predictable research funding and coordinated innovation efforts at both EU and national levels are essential to ensure that PFAS-free solutions reach the market.

By leading the transition to a PFAS-free future, European companies can gain a competitive advantage in the global markets. Without an EU-wide ban, European companies risk a patchwork of national PFAS legislations being introduced as seen in countries such as France, Belgium and Denmark which will be difficult to navigate.

Remediation of PFAS will still need to improve

Remediation of PFAS is challenging because of their chemical, thermal and biological stability and the complexity of PFAS mixtures.

Each treatment technique to remove PFAS from both contaminated soils and drinking water has its advantages and disadvantages, and often a combination of approaches is required for effective

[14] The Global Threat from the Irreversible Accumulation of Trifluoroacetic Acid (TFA) | Environmental Science & Technology
[15] (PDF) Sectoral Costs of Environmental Policy
[16] ChemSec webpage Marketplace https://marketplace.chemsec.org/
[17] ZeroPM Alternative Assessment Database - ZeroPM
[18] J.A. Tickner JA, J.N. Schifano, A. Blake, C. Rudisill, M.J. Mulvihill, 2015. Advancing Safer Alternatives Through Functional Substitution.

treatment.[19] Most methods are also energy-intensive and costly. Moreover, even when PFAS are successfully removed and concentrated, they are rarely fully destroyed and typically break down into short-chain PFAS molecules such as TFA.

For elevated PFAS levels in surface water, deep groundwater and seawater, no feasible large-scale remediation technologies currently exist. Hence, in addition to banning the use of PFAS, it's important that research and development of new remediation techniques continues.

[19] Removal efficiency of multiple poly- and perfluoroalkyl substances (PFASs) in drinking water using granular activated carbon (GAC) and anion exchange (AE) column tests - ScienceDirect