

1. Introduction

The PFAS family is composed of thousands of synthetic organic chemicals that contain at least one perfluorocarbon moiety (e.g. $-CF_2-$) in their molecular structures. They are used or applied most often where extremely low surface tension and/or durable water and oil repellency is needed (e.g., in various fire-fighting foams and for surface treatment of textiles).



2. Why is it relevant?

Since the late 1990s and early 2000s, studies have been conducted to assess some “long-chain” PFASs. Long-chain PFASs have been widely recognized as contaminants of high global concern due to their high persistence, bioaccumulation potential, toxicity, and ubiquitous distribution in the global environment, biota and humans.



PFASs have been widely used in numerous commercial and consumer applications since the late 1940s.

The Organisation for Economic Co-operation and Development maintains a global database of PFASs. A 2018 study identified more than 4,700 Chemical Abstracts Service numbers, which can be associated with a large variety of PFASs that (may) have been on the global market and in the environment.



While substantial progress has been made in understanding the hazards, exposure, risks and treatment of some long-chain PFASs, other PFASs and non-fluorinated alternatives have received limited attention. Information on the hazards of many non-fluorinated alternatives to PFASs is lacking.



In 2009, at the second meeting of the International Conference on Chemicals Management (ICCM2), the stakeholders of the Strategic Approach to International Chemicals Management (SAICM) identified “*managing PFASs and the transition to safer alternatives*” as an issue of concern.



3. Existing instruments and actions

A diverse set of instruments and actions have been taken to address PFASs on different levels. The majority of efforts have focused on phasing out the long-chain PFASs. At the International level, the Stockholm Convention has been a key platform for doing so (though multiple uses are exempted under the Convention), complemented by other regulatory and voluntary actions.

In 2019, perfluorooctanoic acid (PFOA) and its precursors were listed under the Stockholm Convention, and more recently, perfluorohexanesulfonic acid (PFHxS), its salts and PFHxS-related compounds were listed under the Stockholm Convention in 2022.

3. Existing instruments and actions (cont.)

Significant efforts are also under way to address other PFASs. Some regulatory actions have been initiated to better understand PFASs that are not long-chain, and more regulatory actions have also been taken to manage some non-long-chain PFASs.

Some governments, downstream industrial users and retailers have taken a more proactive approach in certain sectors, either restricting all PFASs to only essential uses or entirely phasing out all PFASs in relevant products, for example, for food contact materials, cosmetics and firefighting foams.

Many regulatory, advisory and guidance values for PFAS levels in different environmental compartments have been developed for managing contamination at the local, national and regional scales.



4. Challenges and opportunities



A number of exemptions for long-chain PFASs exist under the Stockholm Convention, including some that may cause substantial direct environmental exposures to humans and ecosystems.

Non-regulatory actions may take less time to set up; however, measures are needed to avoid geographical shifts in production, major uses and releases into countries with less strict regulations.

Most existing instruments take a chemical-by-chemical approach, and some address both the parent compound, and precursors as a group. However, this grouping strategy cannot work effectively with the current practices of replacing existing PFASs with novel PFASs with similar structures and properties.

In the case of long-chain PFASs, duplicate efforts often overlap, and opportunities for efficiency and information sharing are missed.

Exemptions would need to be closed as soon as possible to ensure sound management of PFASs. Concerted actions are needed on an ongoing basis to accelerate and expand the current global implementation of phasing out long-chain PFASs under the Stockholm Convention.

The progress of phasing out long-chain PFASs needs to be periodically assessed, e.g. under the Global Monitoring Plan under the Stockholm Convention.

Novel regulatory and voluntary approaches need to be developed to assess and manage the many PFASs on the market and their potential fluorinated alternatives as a group or groups. Notably, the concept of “essential use”, which is modelled from the Montreal Protocol, is emerging as an option for PFASs.

To accelerate action on PFASs that are not long-chain compounds and transition to safer alternatives, information exchange needs to be strengthened and joint actions need to be fostered across all stakeholders.

