IPEN
for a toxics-free future

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GUIDE TO NEW POPs: LONG-CHAIN PERFLUOROCARBOXYLIC ACIDS (PFCAs), THEIR SALTS, AND RELATED COMPOUNDS

Introduction

The POPs Review Committee has recommended three new chemicals be listed for global elimination at the 2025 Stockholm Convention COP: chlorpyrifos, medium-chain chlorinated paraffins (MCCPs), and long-chain perfluorocarboxylic acids (LC-PFCAs). IPEN's guides briefly describe why each of these hazardous chemicals should be globally banned, without exemptions.

What are Long-chain PFCAs?

Long-chain PFCAs and their salts are a group of PFAS (per- and polyfluoroalkyl substances) with carbon chain lengths of C9-C21. Typically, perfluorooctanoic acid (PFOA) that has a carbon chain length of C8 is included in the category of long-chain PFCAs. However, PFOA was listed under the Stockholm Convention in 2019 and is therefore not included in the group of long-chain PFCAs recommended for listing in 2025. The recommended listing also includes other substances that can break down to long-chain PFCAs, so-called related substances, which means that the recommended listing covers a group of at least 200 PFAS. The POPs Review Committee (POPRC) has developed a draft indicative list of substances covered.

These PFAS are, or have been, widely used in a range of both industrial and consumer applications, including in coatings, cookware, fabric/carpet protectors, textile impregnation agents, production of fluoropolymers, and firefighting foams. They can also be present as impurities from the production process in a wide range of products, including fluorinated polymers.

Long-chain PFCAs are released to the environment at all life cycle stages - either directly or indirectly through transformation from other PFAS.They are emitted from the production of long-chain PFCAs and from the manufacturing, use, and disposal (for example, from landfills, wastewater treatment, and incineration plants) of articles that contain long-chain PFCAs. Recycling of products and articles containing PFAS leads to contamination of, for example, food packaging and textiles (see, for example, the IPEN reports mentioned below and An assessment on PFAS in textiles in Europe's circular economy).

Studies from a wide range of countries by IPEN and partners have shown the presence of long-chain PFCAs in disposable food packaging and tableware, in microwave popcorn, and in waterproof and stain-resistant clothing. Also, studies in Bangladesh link textile production in Bangladesh to contamination of water pollution. IPEN partners' Country Situation Reports from Asia and the Middle East show widespread contamination from PFAS, including long-chain PFCAs, in humans, marine and terrestrial organisms, and the environment.

Long chain PFCAs meet the Stockholm Convention criteria for listing

Long-chain PFCAs all have similar structures and can therefore be expected to exhibit similar POPs properties.

Long-chain PFCAs do not degrade under environmentally relevant conditions. They undergo long-range transport and have been detected globally, in all continents and in all environmental compartments, including biota, freshwater, saltwater, sediment, soil and rainwater. Long-chain PFCAs have been measured in the Antarctic environment and biota, including in penguins, reindeer, muskoxen, Arctic foxes, and Alaskan sea otters. They accumulate in protein-rich tissues, can pass through the placenta into the fetus in humans, and be transferred through breast milk. They have been shown to biomagnify in the food chain for birds and mammals, and some long-chain PFCAs have been detected in top predator species such as polar bears, herring gulls, and peregrine falcons.

Long-chain PFCAs are all expected to exhibit similar adverse effects. Therefore, even for chain-lengths where evidence is scarce, a precautionary approach to include the whole range of nominated chain-lengths is justified. In humans, exposure to long chain PFCAs is associated with liver toxicity, developmental and reproductive toxicity, impacts on the immune system, endocrine disruption, and changes in the function of the heart and metabolic systems.

Proposed Action from the POPRC

The POPs Review Committee (POPRC) has concluded that long-chain PFCAs are likely, as a result of their long-range environmental transport, to lead to significant adverse human health and environmental effects such that global action was warranted. They recommend listing them in Annex A, with specific exemptions. In addition, the POPRC has provided a warning about substitution of these chemicals with other PFAS by urging Parties to "...take into account the information on potential alternatives provided in the risk management evaluation (substances such as some short-chain per- and polyfluoroalkyl substances (PFAS), as mentioned in the risk management evaluation, UNEP/POPS/POPRC.19/9/Add.2, annex), taking into consideration the criteria in paragraph 1 of Annex D to the Convention, to determine whether those alternatives exhibit the characteristics of persistent organic pollutants."

Alternatives exist for all uses of long-chain PFCAs

The POPRC has recommended exemptions for semiconductors and for replacement parts for motor vehicles that have ceased mass production. Some exemptions are proposed to last until 2041, even though the standard procedure of the Convention is a five-year exemption with a possibility to extend another five years (as indicated in the Stockholm Convention Article 4). Also, the long timeline proposed for the exemption would disadvantage companies in the process of finding PFAS-free alternatives.

National or regional controls on long-chain PFCAs have been adopted or are in the final stages of development in many countries, including Canada, the EU, Switzerland, Norway, and the USA, indicating that alternatives are already available or are at advanced stages of development. Chemical and non-chemical alternatives are available for all uses of long-chain PFCAs. This includes many PFAS-free alternatives for the electronics sector. Also, targeted work is underway to phase out the use of PFAS in the production of semiconductors, as show for example in this case study by the Toxics Use Reduction Institute (TURI).

Additional measures are needed to identify products, articles and wastes containing long-chain PFCAs

Recycling has been shown to be a source of PFAS contamination of various product chains due to their widespread use and the lack of transparency of the PFAS content of products and articles. This includes contamination with long-chain PFCAs.

Article 6 of the Stockholm Convention requires Parties to take measures to prevent recycling of listed POPs. However, a report presenting work conducted by the POPRC on “options for identifying persistent organic pollutants in stockpiles, products and articles in use and in wastes” (UNEP/POPS/COP.12/INF/26) shows that Parties are facing significant challenges in fulfilling their Convention obligations regarding traceability and transparency for POPs, leading to recycling of POPs in addition to other sources of human exposure and environmental contamination. These challenges are further confirmed by the information provided in the “Report on the evaluation and review of brominated diphenyl ethers” (UNEP/POPS/COP.12/INF/13), which shows that recycling of products and articles containing brominated flame retardants has led to widespread contamination of articles in use, including plastic toys.

Therefore, additional measures are needed to advance traceability and transparency for long-chain PFCAs and related substances to protect human health and the environment. For further details, see the IPEN brief From Hidden Hazards to Open Data: Advancing Traceability and Transparency for POPs.

Recommendations

As noted in the Risk Management Evaluation (paragraph 159), the most efficient control measure for reducing the releases of long-chain PFCAs, their salts and related compounds to the environment would be to list these substances in Annex A without exemptions. Since chemical and non-chemical alternatives exists for all uses of long-chain PFCAs, IPEN recommends that no exemptions are granted for these substances.

Special care needs to be taken to ensure that articles containing long-chain PFCAs can be identified in pollutants in stockpiles, products, articles in use, and in wastes. Therefore, the listing should be accompanied by a specific requirement for transparency.

Finally, the Conference of the Parties (COP) should adopt a recommendation not to replace long-chain PFCAs with other PFAS. This has been recommended by the POPRC and similar recommendations were adopted by the COP when listing PFHxS and PFOA.