Perfluorooctane Sulfonic Acid (PFOS), its salts and Perfluorooctane Sulfonyl Fluoride (PFOSF)

Stockholm Convention Effectiveness Evaluation

2023 Highlights

Background Information

Historically, PFOS has been used for a variety of products due to its surface-active properties, surface resistance/repellency to oil, water, grease or soil. PFOS can be found in electric and electronic parts, fire fighting foam, photo imaging, hydraulic fluids, leather, paper and textiles.

In 2009, PFOS, its salts, and PFOSF were listed in Annex B to the Stockholm Convention with eight acceptable purposes and 12 specific exemptions. In 2019, the Conference of the Parties amended Annex B to limit production and use to one acceptable purpose and two specific exemptions, which entered into force for most Parties on 3 December 2020. Production and use shall be eliminated by all Parties except those that have notified the Secretariat of the intention to produce and/or use them for specific exemptions and acceptable purposes. As of 31 March 2022, two Parties had registered for the acceptable purpose, and three for the specific exemptions.

Perfluorooctanoic acid (PFOA), its salts and PFOA-related compounds were listed in Annex A to the Stockholm Convention in 2019. At its tenth meeting, the Conference of the Parties listed PFHxS, its salts and related compounds in Annex A to the Convention with no specific exemptions. Like PFOS, its salts and PFOSF, those chemicals also belong to a group of substances called per- and polyfluoroalkyl substances (PFAS) and have similar industrial applications as PFOS. Monitoring data showed an increase in the concentrations of PFOA, perfluorohexane sulfonic acid (PFHxS) and their in environmental media, possibly due to their use as alternatives to PFOS.

Acceptable purposes and specific exemptions for production and use of PFOS, its salts and PFOSF according to Part I of Annex B to the Stockholm Convention

Acceptable purposes	Specific exemptions
Insect baits with sulfluramid (CAS No. 4151-50-2) as an active ingredient for control of leaf-cutting ants from Atta spp. and Acromyrmex spp. for agricultural use only	Metal plating (hard-metal plating) only in closed-loop systems Fire-fighting foam for liquid fuel vapour suppression and liquid fuel fires (Class B fires) in installed systems, including both mobile and fixed systems, in accordance with paragraph 10 of part III of Annex B

Measures to Reduce and/or Eliminate Releases

Providing a global overview of the production and use of PFOS, its salts and PFOSF continues to be challenging. Current estimates are quite uncertain and there continue to be large gaps in the data collected and reported by Parties to the Convention. While there are limited data available, information suggests that there has been significant drop in the production (likely to have ceased in 2020) and use of PFOS, its salts and PFOSF and that alternatives are now widely used. This suggests that the listing of PFOS, its salts, and PFOSF has encouraged the use of alternatives and reduced the need for their continued use. However, there could still be considerable stocks of PFOS, its salts and PFOSF, or waste containing these substances which have yet to be disposed of in an environmentally sound manner.

The listing of PFOS, its salts and PFOSF in 2009, along with eight other chemicals, triggered an increase in the number of Parties having implemented measures, including legal and administrative, to control the production, import, export and use of these chemicals.

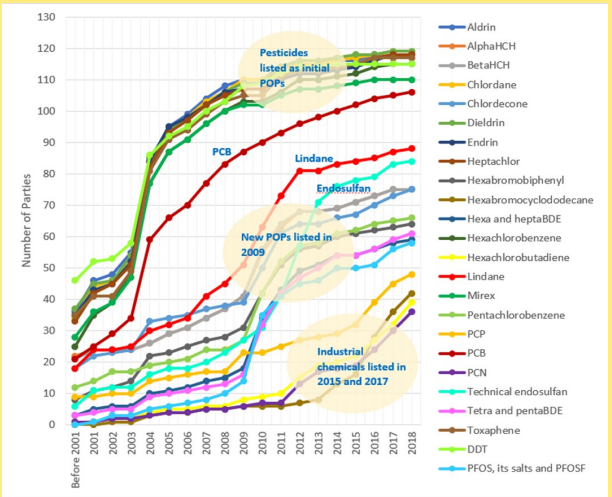

Figure 1. Number of Parties that have implemented measures to control POPs on an annual basis (before 2001 to 2018). (*Source: EE/2 report in UNEP/POPS/COP11/INF/36)*

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Changes in Concentrations Measured in the Environment and in Human Populations

Limited time trends for PFOS are starting to become established. In general, air concentrations of PFOS seem to show increases over the 1990s, then a levelling off and decrease in the early 2000s. There are indications that the levels of PFOS are declining in human tissues (milk and blood). Data for levels of PFOS in human milk indicates an increasing tendency over time followed by a decrease. This suggests that adoption of risk management measures has led to declining levels in humans.

As to PFOS concentrations in water, data is becoming available in most regions. However, differences in sampling locations and in detection limits impede the assessment of trends of PFOS concentrations in water, and thus the assessment of temporal trends for PFOS in water is very challenging. While some locations are showing decreases and others increases, significant declines of PFOS were found in inland waters of several countries/regions.

PFOS emissions continue from product usage, obsolete stockpiles, and waste disposal/dismantling/recycling practices, while open burning of wastes continue to release unintentionally produced POPs to the atmosphere.

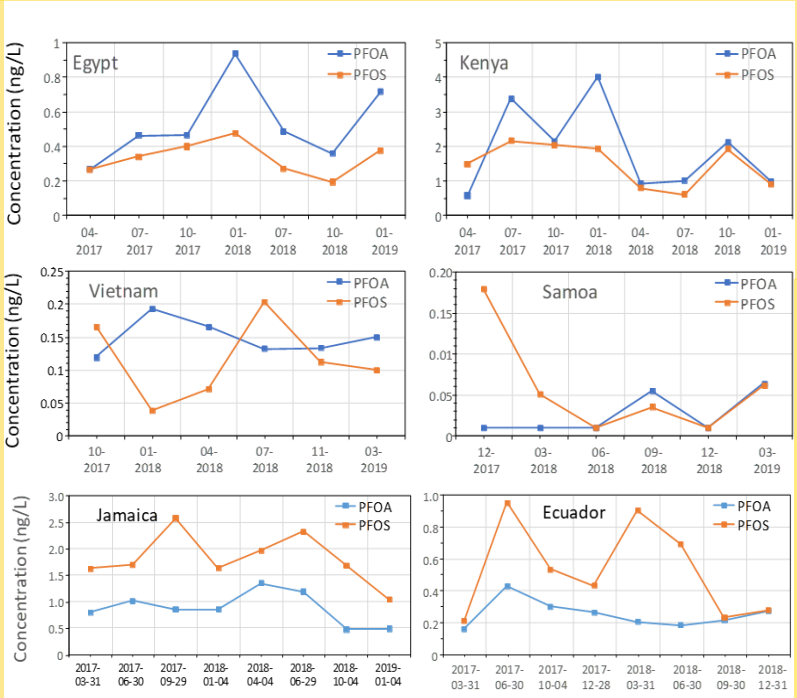

Figure 2. Temporal trends of PFOA and PFOS concentrations in surface waters at sites in Egypt, Kenya, Viet Nam, Samoa, Jamaica and Ecuador. (Source: GMP-3 report in UNEP/POPS/COP.11/INF/38)

Changes Since the First Effectiveness Evaluation

The 2019 amendments to Annex B which limit production and use to one acceptable purpose and two specific exemptions suggests that feasible alternatives have been found for most of the uses that remained when the listing was made in 2009. Available data also point to a large reduction in the production and use of this group of chemicals.

While significant progress has been made in terms of the availability of alternatives to PFOS, its salts and PFOSF, the national capacity to identify and collect information and the legal and regulatory measures to manage the chemicals throughout their lifecycles remains challenging.

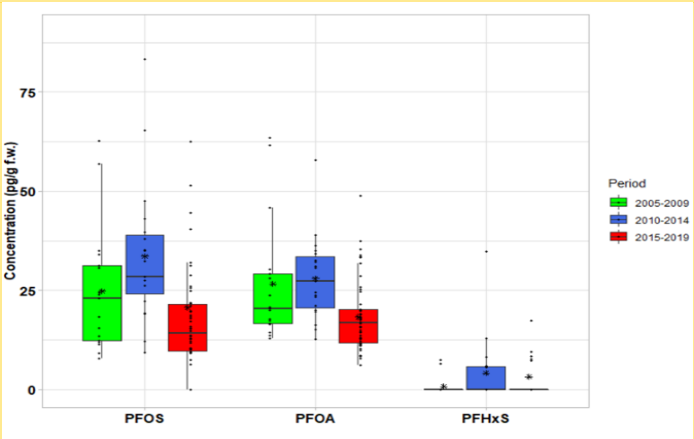

Figure 3. PFOS, PFOA and PFHxS concentrations in human milk (n=86) from the UNEP/WHO Human Milk Survey (2005–2009, 2010–2014, 2015–2019). *(Source: Fiedler et al. 2022 as cited in GMP-3 report in UNEP/POPS/COP.11/INF/38)*

Recommendation of the Effectiveness Evaluation Committee

The Secretariat should **provide technical assistance for developing country Parties and Parties with economies in transition** to identify and collect information on PFAS listed under the Stockholm Convention, strengthen the legislation and/or regulations to manage those chemicals throughout their lifecycles, and to identify and introduce safer, effective and affordable alternatives.

Guidance documents and guidelines have been developed to assist parties in meeting their obligations under the Convention and are available at: http://chm.pops.int/tabid/5225

For more information on the second effectiveness evaluation of the Stockholm Convention, please refer to documents UNEP/POPS/COP.11/19/Add.1 and UNEP/POPS/COP.11/INF/36.

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