Quick Guide to IPEN Views on POPRC18

September 2022

The meeting will address the following items:

Dechlorane Plus and **UV-328:**
i) adoption of their risk management evaluations
ii) decide whether the chemicals should be recommended listing in Annexes A, B and/or C to the convention at the 2023 Conference of the Parties.

Chlorpyrifos, Medium-chained chlorinated paraffins (MCCPs) and Long-chain perfluorocarboxylic acids (LC-PFCAs), their salts and related compounds:
i) adoption of their risk profiles
ii) decide whether the chemicals are likely, as a result of their long-range environmental transport, to lead to significant adverse human health and/or environmental effects such that global action is warranted, and that risk management evaluations should be developed.

Specific exemptions for decabromodiphenyl ether and **short-chain chlorinated paraffins (SCCPs)**:
i) Review the draft reports on the information related to the continued need for specific exemptions
ii) agree on the recommendations to the Conference of the Parties in 2023

Perfluorooctane sulfonic acid (PFOS), its salts and perfluorooctane sulfonyl fluoride (POSF):
i) Review the report on assessment of alternatives to perfluorooctane sulfonic acid, its salts and perfluorooctane sulfonyl fluoride
ii) Review the draft report on the evaluation of perfluorooctane sulfonic acid, its salts and perfluorooctane sulfonyl fluoride
iii) agree on the recommendations for the continued need for PFOS to the Conference of the Parties in 2023

Guidance on Long-range environmental transport:
i) comments on the draft guidance
ii) agree on next steps

Dechlorane plus (DP) and its syn- and anti- isomers

DP is a dangerous, highly persistent and bioaccumulative flame-retardant chemical. It is a plastic additive that has adverse effects on the liver, endocrine system, and neurodevelopment.

At POPRC-17, the Committee concluded that DP is likely, as a result of its long-range environmental transport, to lead to significant adverse human health and/or environmental effects such that global action is warranted.

Manufactured since the 1960s, DP is now produced in only one or two known locations. DP contaminates the global environment including biota of the Arctic, Antarctic, and the Tibetan plateau. In addition to long-range transport through air and in seawater, DP may also be distributed into remote regions through migratory species and oceanic transport of plastic debris. DP is found in human cord blood serum, placental tissue, and breast milk, thus posing a threat to the health of the developing child. DP was frequently detected in baby foods (formula, cereals, puree) analyzed from China and the U.S., with very high DP concentrations found in a Chinese formula sample and in a U.S. cereal sample.

It has been estimated that listing DP in Annex A could reduce global emissions by 91% in less than ten years. There are both chemical and non-chemical alternatives available on the market today. The most effective means to protect human health and the environment from the risks associated with DP is a therefore a complete prohibition on its production, sale and use.

Conclusion
Dechlorane Plus should be recommended for listing in Annex A with no specific exemptions.

UV-328

UV-328 is a high production volume, benzotriazole UV-stabilizer that is used in plastics, coatings, and personal care products. IPEN has also shown that it is present in toys, hair accessories, beached pellets, and recycled pellets. UV-328 is released into the environment during its production, use and disposal stages. Long-range transport of UV-328 via water occurs when plastics containing UV-328 are transported to remote locations, which has been well documented in scientific studies. Additionally, UV-328 can be conveyed through long-range atmospheric transport via aerosol particles and with migratory species such as seabirds. UV-328 is toxic to mammals and can cause specific organ toxicity to the liver and kidneys upon repeated exposure. It has anti-androgenic activity, can cause alterations in reproductive organs and changes in enzymatic activity. At POPRC-17, the Committee concluded that UV-328 is likely, as a result of its long-range environmental transport, to lead to significant adverse human health and/or environmental effects such that global action is warranted.

Several countries already have restrictions on UV-328. In the EU UV-328 is identified as a substance of very high concern and placed on the REACH authorization list due to its very persistent, very bioaccumulative and toxic properties. The latest application date for authorization was in May 2022 and no applications were received, indicating an ongoing phaseout. Moreover, there are hundreds of available alternative UV-stabilizers in use on the market today.

The most effective means to protect human health and the environment from the risks associated with UV-328 is therefore a complete prohibition on its production, sale and use.

Conclusion
UV-328 should be recommended for listing in Annex A with no specific exemptions.

Chlorpyrifos

Chlorpyrifos is a widely used organophosphate pesticide, applied as an insecticide in agriculture and as a biocide to control non-agricultural pests. It has been banned several countries, including Morocco, Saudi Arabia, Sri Lanka, Indonesia and Switzerland. In the European Union, it was not approved for renewal in 2019 because of its health impacts and the conclusion that no safe levels could be set for the substance.

Chlorpyrifos displays high acute and chronic toxicity to aquatic organisms, birds and vertebrates, and an even higher toxicity to insects. There is evidence of developmental neurotoxicity both *in vivo* animal studies and epidemiological evidence demonstrates that chlorpyrifos can damage the developing brains of children, causing reduced IQ, loss of working memory, and attention deficit disorders.

Chlorpyrifos is persistent with a half-life in water greater than two months and degrades slowly in soil under both aerobic and anaerobic conditions. The degradation of chlorpyrifos is temperature dependent, which means that chlorpyrifos is expected to persist in colder regions such as the Arctic and sub-Arctic for a considerable length of time.

Reported log K_{ow} values between 4.7 and 5.2 and log K_{oa} values between 8.3 and 8.9 indicate potential for bioaccumulation in aquatic and air-breathing organisms. Also, a BCF of >5000 has been reported for several species and life stages. Bioaccumulation is also supported by monitoring studies detecting chlorpyrifos in apex predators in remote regions. Considering the high toxicity of chlorpyrifos, even moderate bioaccumulation leads to body burdens where adverse effects are seen. Concentrations currently detected in the environment are therefore already enough to cause adverse effects.

Chlorpyrifos has been found in biota at different trophic levels in remote regions such as caribou, seals and polar bears. It has also been widely detected in the Arctic in abiotic compartments such as seawater, ice, and air.

Conclusion

Chlorpyrifos is likely, as a result of its long-range environmental transport, to lead to significant adverse human health and/or environmental effects, such that global action is warranted. It should therefore advance to the risk management (Annex F) stage of evaluation.

Long-chain perfluorocarboxylic acids (PFCAs), their salts, and related compounds

Long-chain PFCAs (with carbon chain lengths C9-C21), their salts and related compounds 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. 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 accumulate in protein-rich tissues, can pass through the placenta into the fetus in humans, and be transferred through breast milk. The elimination of long-chain PFCAs in humans is very slow, resulting in long estimated half-lives of 2.5 to 12 years, depending on chain length.

BCFs and BAFs > 5000 have been reported for C9 – C14 long-chain PFCAs in freshwater and marine aquatic organisms. C9 – C16 PFCAs have been reported to biomagnify in the food chain for birds and terrestrial/marine mammals with BMFs or TMFs > 1. C18 PFCAs has been measured in the environment and in some top predator species such as polar bears, herring gulls and peregrine falcons.

Long-chain PFCAs have been detected globally, in all continents as well as in all environmental compartments, including biota, freshwater, saltwater, sediment, soil and rainwater. Long-chain PFCAs undergo long-range transport and have been measured in Antarctic biota, including penguins; and in Arctic biota such as polar bears, reindeer, muskoxen, Arctic foxes and Alaskan sea otters; and in environmental matrices such as snow, ice and lake water.

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. Human adverse effects associated with exposure include hepatotoxicity, developmental/reproductive toxicity, immunotoxicity, thyroid toxicity and altered cardiometabolic function.

Conclusion

Long-chain perfluorocarboxylic acids, their salts and related compounds are likely, as a result of their long-range environmental transport, to lead to significant adverse human health and/or environmental effects, such that global action is warranted. They should therefore advance to the risk management (Annex F) stage of evaluation.

Medium Chain Chlorinated Paraffins (MCCPs)

Chlorinated paraffins (CPs), also known as polychlorinated n-alkanes, are a large group of high production industrial chemicals that are classified according to their chain length and degree of chlorination. Medium Chain Chlorinated Paraffins is used for chlorinated paraffins with carbon chain lengths in the range of C14-17 and exceeding 45% chlorine by weight.

MCCPs are used as flame retardants, plasticizers in polyvinyl chloride plastics, in metal working fluids, and as additives to paints and sealants. With global restrictions on short chain chlorinated paraffins (SCCPs), including listing of SCCPs in Annex A of the Stockholm Convention for global elimination in 2017, MCCPs have assumed the role of "regrettable substitutes," and production of MCCPs now exceeds that of SCCPs. At POPRC-17, the Committee agreed that the screening criteria for Annex D for MCCPs were met and that the group should advance to the risk profile stage.

Data from remote regions, such as biomonitoring of ringed seals and polar bears in the Arctic, have demonstrated that MCCPs undergo long-range transport, this has been further evidenced by findings of relatively high concentrations in Arctic fish.

Multiple studies have shown that MCCPs are persistent in the environment. This is also supported by their presence in sediment cores from the 1940s and 1950s, which demonstrate that MCCPs persist in sediment over decades and degrade slowly.

Several studies have shown that MCCPs bioaccumulate. Measured bioconcentration factors (BCF) exceed 5,000 in fish, and the predicted and measured log K_{ow} for CPs with chlorination levels >45% and chain lengths C14-17 is above 5.

MCCPs are toxic to aquatic invertebrate organisms and impair reproduction in earthworms. In rainbow trout, exposure to MCCPs was associated with behavioral impacts and harmful effects on the liver and thyroid. Studies of prenatal effects on rabbits and rats showed reduced fetal body weight. MCCPs also affected postnatal development, with exposures resulting in reduced pup body weight and survival. Studies indicate that MCCPs adversely affect the liver, kidney, and the thyroid gland in humans, and a recent study found that MCCPs were the most abundant of the CP groups measured in human breast milk.

Conclusion

MCCPs are likely, as a result of their long-range environmental transport, to lead to significant adverse human health and/or environmental effects, such that global action is warranted. They should therefore advance to the risk management (Annex F) stage of evaluation.

Specific exemptions for decabromodiphenyl ether and short-chain chlorinated paraffins

COP8 decisions SC-8/13 and SC-8/14 resulted in the adoption of numerous specific exemptions for the listings of DecaBDE and SCCPs, that were not recommended by the POPRC. It was agreed that Parties requesting exemptions needed to submit justifications for their need of these exemptions.

For SCCPs, the draft report on the review of submitted notes that by august 2022 "no party for whom the amendment is in effect had registered for any of the specific exemptions." Additionally, the risk management evaluation prepared by POPRC in 2016 showed that there are technically feasible, commercially available alternatives for all uses of SCCPs.

The continued use of brominated flame retardants in general and DecaBDE in particular has been shown to cause widespread contamination of products made from recycled plastics, even though recycling of DecaBDE containing plastic is not exempted. The exemptions mean that large volumes of DecaBDE contaminated waste will be generated for decades to come, especially noting the presence of DecaBDE in end-of-life vehicles until 2040 and the projected increase from the construction and demolition sector that is only projected to reach a plateau between 2040 and 2060.

Recommendations

In order to ensure that human health and the environment is protected from the harmful effects of SCCPs and DecaBDE, and to uphold the global elimination of these substances as intended by the Convention listing, there is an urgent need to end these exemptions.

No party has registered for specific exemptions for SCCPs, and available safer alternatives were identified already in the 2016 POPRC evaluation. Therefore, the POPRC should recommend to the Conference of the Parties to close the specific exemptions for SCCPs.

Parties should accelerate their shift to non-brominated alternatives, and remaining products and articles should be labeled to ensure that they can be removed during the waste stage. No parties have registered for the polyurethane foam for building insulation exemption, which should be ended.

Noting the widespread contamination caused by these exemptions, this should be a lesson to learn from when considering exemptions for other POPs.

Alternatives to Perfluorooctane sulfonic acid (PFOS), its salts and perfluorooctane sulfonyl fluoride (POSF)

PFOS is listed in Annex B of the Convention and COP11 is required to evaluate the continued need for acceptable purposes and specific exemptions. The current list includes two specific exemptions for hard-metal plating and fire-fighting foam, and one acceptable purpose for Insect baits for control of leaf-cutting ants from *Atta spp.* and *Acromyrmex spp*.

Recommendations

Hard-metal plating

Many countries are transitioning away from this use of PFOS. Therefore, it is feasible to end this exemption and accelerate efforts facilitating technology transfer to speed up phase out in all countries. A strong recommendation should be made by the POPRC to transition to the non-fluorinated alternatives available.

Fire-fighting foam

Fluorine-free formulations are available and as effective as PFOS-based foams. Alternatives meet established performance standards for aviation, military, and industrial applications. The POPRC determined that, "fluorine-based fire-fighting foams have negative environmental, human health and socioeconomic impacts due to their persistency and mobility." This specific exemption should be ended.

Insect baits for control of leaf-cutting ants from *Atta spp.* and *Acromyrmex spp*

This is an open, dispersive application of PFOS use and should be prioritized for phase-out. While drop-in chemical replacements may not be desirable, the existence of some non-chemical alternatives and the significant PFOS pollution that results from this activity must be addressed. The acceptable purpose for PFOS use in in insect baits should be converted to a specific exemption for specified crops of economic importance to spur more rapid adoption of alternatives.

Guidance on Long-range environmental transport

The POPRC will consider the draft document and the next steps forward. IPEN appreciates all the hard work done by the drafters and the intersessional working group, and believes the document contains a lot of useful information. However, IPEN also believes the document would benefit from additional work until POPRC-19 in 2023.

IPEN notes the following important points for further consideration:

- Care must be taken to ensure that any conclusions in the document are based on studies that also consider properties of the newer POPs, and not only the original "dirty dozen" POPs.
- It is important that any consideration of local sources is undertaken with the same scientific rigor and requirements for independent, peer reviewed, scientific references as the evaluation of long-range transport. Also, The POPRC evaluation process builds on a range of studies, which minimizes the risk of local point sources playing any significant role.
- The scope of the document is the Annex D criteria for long-range transport, and while this has implications for the Annex E evaluation, the guidance must not make any judgements on other criteria.
- The discussion on particle transport in the oceans is largely based on older scientific studies and would strongly benefit from more updated knowledge on how different types of particles are transported.
- While it is important to distinguish between chemicals sorbed to plastics and chemicals used in plastics, it should be noted that sorption and desorption of chemicals on plastics is complex and not yet fully understood by the scientific community. Care should therefore be taken not to minimize the importance of this potential transport pathway.