



Royal Society of Chemistry Response to the UNEP Consultation on Priorities for Further Work and potential further international action on Issues of Concern

Submitted 11 August 2023

Personal Information:

Institution/Organization: Royal Society of Chemistry

Type of Institution: Civil Society Organization – Professional Body – Science & Technology

If relevant, please describe the membership coverage, geographical coverage and area of interest of your institution:

The RSC is an accredited UNEP major group stakeholder in Science & Technology.

With about 50,000 members in over 100 countries and a knowledge business that spans the globe, the Royal Society of Chemistry is the UK's professional body for chemical scientists, supporting and representing our members and bringing together chemical scientists from all over the world. Our members include those working in academia, researchers and students in universities, teachers, consultants, large multinational companies, small to medium enterprises and regulators.

The Royal Society of Chemistry is a leading global publisher with a portfolio of environmental and sustainable chemistry journals.

Our work on chemicals, waste and pollution science-policy can be found on the RSC website at:

<https://www.rsc.org/policy-evidence-campaigns/chemical-waste-and-pollution/>

Our work focuses on groups of chemicals and broad strategic themes of chemicals policy.

Whilst individual chemicals are important topics in the 19 Issues of Concern, the RSC has not provided evidence into this consultation at this time on individual chemical elements or substances. Our science-policy work to date has majored on the themes of

- Chemicals in Products
- PFAS
- EDCs
- Microplastics
- HSLEEP

Country: United Kingdom

Questions

1. Arsenic

Screening Question - Arsenic

Arsenic is a naturally occurring metalloid that is ubiquitous in the Earth's crust. It is present in various inorganic and organic forms. Arsenic and arsenic compounds are used intentionally in wood preservatives, pesticides, animal feed additives, pharmaceuticals, glass production, alloy manufacturing, electronics, and semiconductor manufacturing.

Please visit the two-page factsheet on [Arsenic](#) for more information on the topic.

1. **Entry question:** Would you like to provide responses on this issue of concern? *(Please select only 1 option below. If you select a "No" option, you may move to the next issue of concern, e.g. Bisphenol A (BPA))*

- Yes
- No, I do not know enough about this issue
- No, this issue is not relevant to my country or institution
- No, other

- a. If you selected "No, other" in the previous question, please elaborate here:

The scientific community has access to a large amount of evidence on arsenic toxicity and its impacts on humans and the environment, but the body of scientific evidence is too large for the RSC to provide any technical evaluations and conclusions on this individual substance at this point in time. The toxicity of arsenic is well understood and there appears generally to be consensus on the scientific evidence.

The RSC may be able to connect UNEP to international scientific experts on arsenic chemistry and toxicity if required.

Examples of the type of science and technology evidence that is available is:

[A review on arsenic in the environment: contamination, mobility, sources, and exposure - RSC Advances \(RSC Publishing\) 2023,13, 8803-8821](#)

<https://doi.org/10.1039/D3RA00789H>

[Adsorption and degradation of pollutants Home \(rsc.org\)](#)

RSC Advances (RSC Publishing) 2018,8, 39545-39560

<https://doi.org/10.1039/C8RA08512A>

2. Bisphenol A (BPA)

Screening Question - Bisphenol A (BPA)

Bisphenols are a group of dozens of organic compounds that have been used as building blocks in the production of polycarbonate plastics, epoxy resins and other products since the 1960s. The variety of products include water bottles, sports equipment, medical devices, household electronics, thermal paper receipts, and food and beverage cans.

Among the bisphenols, bisphenol A (BPA) has attracted the most attention. The consumption of BPA and related products is widespread and estimated to continue to grow in the foreseeable future, driven mainly by increasing demand for polycarbonates and other plastics.

Please visit the two-page factsheet on [Bisphenol-A](#) for more information on the topic.

1. **Entry question:** Would you like to provide responses on this issue of concern? (*Please select only 1 option below. If you select a "No" option, you may move to the next issue of concern, Cadmium*)

- Yes
- No, I do not know enough about this issue
- No, this issue is not relevant to my country or institution
- No, other

- a. If you selected "No, other" in the previous question, please elaborate here:

The scientific community has access to a large amount of evidence on BPA toxicity and its impacts on humans and the environment, but the body of scientific evidence is too large for the RSC to provide any technical evaluations and conclusions on this individual substance at this point in time.

There appears to be differences of views in different parts of the world on the interpretation of the scientific evidence for BPA that requires further investigation and discussion to reach globally harmonised conclusions.

For example – please see the UK Committee on Toxicity evidence collation from March 2023.

<https://cot.food.gov.uk/Introduction-%20%28BPA%29%20in%20foodstuffs%20%E2%80%93%20Reproductive%20and%20Developmental%20Toxicity>

The RSC may be able to connect UNEP to international scientific experts on BPA chemistry and toxicity if required.

Example of the type of science and technology evidence that is available is:

[A guide towards safe, functional and renewable BPA alternatives by rational molecular design: structure–property and structure–toxicity relationships - Polymer Chemistry \(RSC Publishing\) 2021](#) <https://doi.org/10.1039/D1PY00909E>

Provision of authoritative review of the globally available evidence could in principle be performed by a new science-policy panel for chemicals, waste and pollution prevention?

3. Cadmium

Screening Question - Cadmium

Cadmium is a toxic metal that is naturally found in the Earth's crust, generally at low levels. Cadmium and cadmium compounds are mainly used in nickel-cadmium batteries, alloys, coatings and plating, pigments in plastics, glasses, ceramics and paints, solar cells, PVC stabilisers and others. It has been produced, used and released in large quantities, and thus intentional human uses have caused widespread, persistent contamination and exposure.

Please visit the two-page factsheet on [Cadmium](#) for more information on the topic.

1. **Entry question:** Would you like to provide responses on this issue of concern? *(Please select only 1 option below. If you select a "No" option, you may move to the next issue of concern, Glyphosate)*

- Yes
- No, I do not know enough about this issue
- No, this issue is not relevant to my country or institution
- No, other

- a. If you selected "No, other" in the previous question, please elaborate here:

The scientific community has access to a large amount of evidence on cadmium toxicity and its impacts on humans and the environment, but the body of scientific evidence is too large for the RSC to provide any technical evaluations and conclusions on this individual substance at this point in time. The toxicity of cadmium is well understood and there appears generally to be consensus on the scientific evidence.

The RSC may be able to connect UNEP to international scientific experts on cadmium chemistry and toxicity if required.

The UK Committee on Toxicity statement number 05/22 on cadmium in the maternal diet can be found at:

<https://cot.food.gov.uk/Cadmium%20in%20the%20Maternal%20Diet%20-%20Conclusions>

Examples of the type of science and technology evidence that is available is:

[Mechanisms of metal toxicity in plants - Metallomics \(RSC Publishing\) 2016](#)

<https://doi.org/10.1039/C5MT00244C>

4. Glyphosate

Screening Question - Glyphosate

Glyphosate is an organophosphorus herbicide for agricultural, forestry and residential weed control that kills or suppresses all plant types, with the exception of those genetically modified to be tolerant to it. Since its introduction in 1974, glyphosate has become the most widely used herbicide worldwide. The largest use of glyphosate has been in agriculture, however glyphosate use in urban settings can also be a significant source of contamination.

Please visit the two-page factsheet on [Glyphosate](#) for more information on the topic.

1. **Entry question:** Would you like to provide responses on this issue of concern? *(Please select only 1 option below. If you select a "No" option, you may move to the next issue of concern, Lead)*

- Yes
- No, I do not know enough about this issue
- No, this issue is not relevant to my country or institution
- No, other

- a. If you selected "No, other" in the previous question, please elaborate here:

The scientific community has access to a large amount of evidence on glyphosate toxicity and its impacts on humans and the environment, but the body of scientific evidence is too large for the RSC to provide any technical evaluations and conclusions on this individual substance at this point in time.

There appears to be differences of views in different parts of the world on the interpretation of the scientific evidence for glyphosate that requires further investigation and discussion to reach globally harmonised conclusions.

The RSC may be able to connect UNEP to international scientific experts on glyphosate chemistry and toxicity if required.

Examples of the type of science and technology evidence that is available are:

[The fate of a hazardous herbicide: a DFT-based ab initio study on glyphosate degradation - Environmental Science: Processes & Impacts \(RSC Publishing\) 2021, 23 1018-1028.](#)
<https://doi.org/10.1039/D1EM00100K>

[On the degradation pathway of glyphosate and glycine - Environmental Science: Processes & Impacts \(RSC Publishing\) 2018, 20, 1148-1157.](#) <https://doi.org/10.1039/C8EM00119G>

Provision of authoritative review of the globally available evidence could in principle be performed by a new science-policy panel for chemicals, waste and pollution prevention?

5. Lead

Screening Question - Lead

Lead is a toxic metal that occurs naturally in the Earth's crust. It may exist in both inorganic and organic forms. The current global uses of lead are in batteries, rolled and extruded products, pigments and other product additives (e.g. for paints, cathode ray tubes, enamels and ceramics, PVC stabilisers), ammunition, alloys, cable sheathing and other uses

Please visit the two-page factsheet on [Lead](#) for more information on the topic.

1. **Entry question:** Would you like to provide responses on this issue of concern? *(Please select only 1 option below. If you select a "No" option, you may move to the next issue of concern, Microplastics)*

- Yes
- No, I do not know enough about this issue
- No, this issue is not relevant to my country or institution
- No, other

- a. If you selected "No, other" in the previous question, please elaborate here:

The scientific community has access to a large amount of evidence on lead (Pb) toxicity and its impacts on humans and the environment, but the body of scientific evidence is too large for the RSC to provide any technical evaluations and conclusions on this individual substance at this point in time. The toxicity of lead (Pb) is well understood and there appears generally to be consensus on the scientific evidence. There may be some differences globally in the interpretation of evidence for risk assessment in the area of neurodevelopmental effects in children.

The RSC may be able to connect UNEP to international scientific experts on lead (Pb) chemistry and toxicity if required.

Examples of the type of science and technology evidence that is available are:

[All-inorganic lead-free perovskites for optoelectronic applications - Materials Chemistry Frontiers \(RSC Publishing\)](#) 2019, 3, 365-275. <https://doi.org/10.1039/C8QM00611C>

Lead exposure in children *British Medical Journal* 2022; 377 doi: <https://doi.org/10.1136/bmj-2020-063950> (Published 07 April 2022) Cite this as: *BMJ* 2022;377:e063950

6. Microplastics

Screening Question - Microplastics

Microplastics are solid particles made of synthetic polymers, typically defined as smaller than 5 mm. Microplastics have been intentionally added to a wide range of products and application areas for diverse technical functions. For example, they are added in cosmetics and personal care products, detergents and maintenance products, agriculture and horticulture, medical devices and in vitro diagnostic medical devices, medicinal products for human and veterinary use, food supplements, paints, coatings and inks, oil and gas drilling and production, plastics, technical ceramics, media for abrasive blasting, adhesives, 3D printing materials and printing inks.

Please visit the two-page factsheet on [Microplastics](#) for more information on the topic.

1. **Entry question:** Would you like to provide responses on this issue of concern? *(Please select only 1 option below. If you select a "No" option, you may move to the next issue of concern, Neonicotinoids)*

- Yes
- No, I do not know enough about this issue
- No, this issue is not relevant to my country or institution
- No, other

- a. If you selected "No, other" in the previous question, please elaborate here:

Technical Questions - Microplastics

Microplastics are solid particles made of synthetic polymers, typically defined as smaller than 5 mm. Microplastics have been intentionally added to a wide range of products and application areas for diverse technical functions. For example, they are added in cosmetics and personal care products, detergents and maintenance products, agriculture and horticulture, medical devices and in vitro diagnostic medical devices, medicinal products for human and veterinary use, food supplements, paints, coatings and inks, oil and gas drilling and production, plastics, technical ceramics, media for abrasive blasting, adhesives, 3D printing materials and printing inks.

Please visit the two-page factsheet on [Microplastics](#) for more information on the topic.

Please answer the questions below that are relevant to your organization/ country/ region:

1. Do you agree with the assessment report that further international action is necessary*? *(If you select "No", you are welcome to answer the questions below or you may proceed directly to question 9)*

- Yes
- No
- Do not know

- a. Please provide a brief explanation for your response*.

Microplastic pollution is pervasive and knows no boundaries. Microplastics are generated all over the world from multiple sources and are found in the remotest parts of the planet. Pathways of exposure to humans and wildlife are via air, land, water, food, waste. The problem of microplastics persistence and presence in the human body and in wildlife is too large for one nation to solve alone.

Given the persistence of plastic in the environment and projections that unmanaged plastic waste is expected to at least double within the next two decades, it is a great concern that microplastics have potentially far-reaching impacts (i.e. physical effects due to their size; as a source of harmful chemicals; acting as vectors for other pollutants) on the environment and living organisms.

More at <https://www.rsc.org/globalassets/22-new-perspectives/sustainability/progressive-plastics/explainers/rsc-explainer-7---microplastics.pdf>.

[The massive problem of microplastics | Feature | RSC Education](#)

by Dr Camilla Alexander-White November 2016. Education In Chemistry feature article.

[Microplastics are all around us - YouTube](#) 'Brought to You by Chemistry' RSC PodCast 2022

[RSCPolicyPosition-Plastic-waste](#) Sept 2019

[c19_tl_sustainability_cs3_whitepaper_a4_web_final.pdf \(rsc.org\)](#) Science to enable sustainable plastics – A white paper from the Chemical Sciences and Society Summit (CS3) June 2020.

[Additives for degradable plastics MASTER v6 \(rsc.org\)](#) RSC explainer

[Microplastics in ecosystems: their implications and mitigation pathways - Environmental Science: Advances \(RSC Publishing\)](#) 2022, 1, 9-29. <https://doi.org/10.1039/D1VA00012H>

2. What types of international actions should be taken? *(Multiple answers based on the catalogue of action, Please refer to the [catalogue of international actions](#) prepared by UNEP for more information on available options).*

- Legally binding*
- Soft law*
- Information sharing and awareness/ Voluntary initiatives*
- No international actions are needed*
- Other: _____.*

Provision of authoritative review of the globally available evidence could in principle be performed by a new science-policy panel for chemicals, waste and pollution prevention?

a) Please explain your response, including examples if possible*.

A key pillar of international action on microplastics will be the legally binding instrument on plastic pollution, but its implementation needs to be coordinated with relevant multilateral environmental agreements (in particular BRS) and other efforts such as SAICM and the Science-Policy Panel on Chemicals, Waste and the Prevention of Pollution.

3. Which type of approach or measure would you see as appropriate to address this issue at the international level? *(Multiple answers based on the catalogue of action, Please refer to the [catalogue of international actions](#) prepared by UNEP for more information on available options).*

- Regulatory control measures*
- Information based and enforcement tools (such as Scientific and technical and guidelines, Guidelines and tools for enforcement, Awareness tools (including of consumers))*
- Options / guidance for economic instruments*
- Voluntary measures and approaches: (such as Guidelines, principles and strategies)*
- Measures supporting science-based knowledge and research*
- Other: _____*

a. Please explain your response, including examples if possible: *with an issue as large as this it is expected a regulatory toolbox will be needed.*

4. What factors prevent action/progress on addressing the issue in your country/ organization *(Multiple answers based on list below)?*

- Lack of technical capacity*
- Lack of scientific knowledge*
- Difficulties in sharing knowledge and coordinating action among different stakeholders and across sectors*
- Difficulty with resource mobilisation*
- Lack of economically feasible green and sustainable alternatives*
- Only coordinated international action can address the issue (e.g., due to transboundary effects, or prevalence of chemicals in international trade)?*
- None, there are no factors preventing action or progress*
- Other: _____*

- a. Please explain your response, including examples if possible:

Coordinated action is not yet in place but is required, in part due to the transboundary effects of microplastics and the pervasiveness of plastics across global value chains. In addition, there are still many (scientific) unknowns regarding the impacts of micro- and nanoplastics and in terms of low-harm alternatives to chemicals of concern currently used in plastics, and technologies to prevent microplastic formation and remedy contamination at scale are lacking.

5. Can you point to existing initiatives that could be replicated or scaled up at the international level? *(Open space answer. Please share a weblink to the initiative(s) if available).*

[EU-level legislation to restrict intentionally-added microplastics](#) is currently being scrutinised by the European Parliament and Council. Restrictions should go beyond wash-off cosmetics to also include intentionally added microplastics include detergents, fertilisers, and some leave-on cosmetics (including glitter-based ones).

6. Which sectors/value chains need to be closely involved in developing solutions? *(Multi-choice. Please visit the two-page factsheet on [Microplastics](#) for more information on the topic. If you select "Other", please elaborate your response).*

- Agriculture and food production*
- Construction*
- Electronics*
- Energy*
- Health*
- Labour*
- Pharmaceuticals*
- Public, private, blended finance*
- Retail*
- Textiles*
- Transportation*
- Waste*
- Other: _____*

The textile, retail, agriculture and food production sectors in particular need to work with product designers, materials scientists, toxicologists and other scientific disciplines to work towards materials and products that shed fewer microplastics, contain no harmful chemicals that microplastics could carry into the environment, and that contain sustainable alternatives to plastics

7. Which international forum or instrument would be best placed to take the lead on international action on this issue? *(Open space to elaborate. Please provide specific examples of e.g., intergovernmental bodies, multilateral agreements within or outside the chemicals and waste cluster, international instruments...).*

The Plastics Treaty.
Stockholm convention.

- a. Which international agendas have important linkages with this issue of concern? *(Multiple answers based on list below. For more information, please see the [UNEP assessment paper on linkages with other clusters related to chemicals and waste](#)):*

- Agriculture and Food*
- Biodiversity*
- Climate Change*
- Health*
- Human Rights*
- Sustainable Consumption and Production*
- World of Work*
- Other: Provision of authoritative review and consistent global evidence from a new science-policy panel for chemicals, waste and pollution prevention.*

- b. Please explain your response, including examples if possible. *(Open space question. For more information, please see the [UNEP assessment paper on linkages with other clusters related to chemicals and waste](#)):*

The Basel and Stockholm conventions do address some of the issues, but there is opportunity to make action more concrete and legally bind countries as part of relevant core obligations within the international instrument on plastic pollution. Linkages with international agendas include with agriculture and food production (e.g. agricultural mulching films shed microplastics, and so does unmanaged food packaging), biodiversity and climate change (e.g. there appears to be significant bioaccumulation of microplastics, and microplastics are also known to have impacts on plankton populations which play a key role in climate regulation), and sustainable production and consumption (e.g. unmanaged plastic waste is projected to at least double by 2040, and there is mileage in finding sustainable alternatives to using plastic in certain products).

8. What priority level do you attach to this issue for international action?

- Very high*
- High*
- Medium*
- Low*
- Very low*

9. Is there any priority further work you would like to suggest at the national level*? *(Open space to elaborate. Please share a weblink to the suggestion(s) if available).*

Not at this time.

10. Is there any priority further work you would like to suggest at the regional level*? *(Open space to elaborate. Please share a weblink to the suggestion(s) if available).*

Not at this time.

7. Neonicotinoids

Screening Question - Neonicotinoids

Neonicotinoids are a class of neuroactive insecticides chemically related to nicotine. Since the first neonicotinoid (imidacloprid) was commercialized in the 1990s, seven main compounds (acetamiprid, clothianidin, dinotefuran, imidacloprid, nitenpyram, thiamethoxam and thiacloprid) are now available on the global market. Today, neonicotinoids are used in protecting plants, livestock and pets from pest insects, as well as for malaria vector control, i.e., mosquitos, to protect humans, in more than 100 countries. Neonicotinoids are also used as biocides.

Please visit the two-page factsheet on [Neonicotinoids](#) for more information on the topic.

1. **Entry question:** Would you like to provide responses on this issue of concern? *(Please select only 1 option below. If you select a "No" option, you may move to the next issue of concern, Organotins)*

- Yes
- No, I do not know enough about this issue
- No, this issue is not relevant to my country or institution
- No, other

- a. If you selected "No, other" in the previous question, please elaborate here:

The scientific community has access to a large amount of evidence on the effects of neonicotinoids in humans and wildlife, but the body of scientific evidence is too large for the RSC to provide any technical evaluations and conclusions on these substances at this point in time.

There appears to be differences of views in different parts of the world on the interpretation of the scientific evidence for neonicotinoids that requires further investigation and discussion to reach globally harmonised conclusions.

The RSC may be able to connect UNEP to international scientific experts on neonicotinoid chemistry and toxicity if required.

Example of the type of science and technology evidence that is available is:

[A critical review on the potential impacts of neonicotinoid insecticide use: current knowledge of environmental fate, toxicity, and implications for human health - Environmental Science: Processes & Impacts \(RSC Publishing\) 2020, 22, 1315-1346. <https://doi.org/10.1039/C9EM00586B>](#)

Provision of authoritative review of the globally available evidence could in principle be performed by a new science-policy panel for chemicals, waste and pollution prevention?

8. Organotins

Screening Question - Organotins

Organotins are organic compounds that contain at least one tin-carbon bond. There are four main groups of organotin compounds, which are used in various applications. Mono- and di-organotins are mainly used as heat stabilisers in polyvinyl chloride (PVC) in a wide range of applications, including window frames and house siding, PVC pipes, food contact blister packs and water bottles. Tri-organotins are mainly used as biocides (e.g. in wood preservatives, in anti-fouling paints for boats and in textiles) and as pesticides. Tetra-organotins have been used as intermediates in the preparation of other organotins and as oil stabilisers.

Please visit the two-page factsheet on [Organotins](#) for more information on the topic.

1. **Entry question:** Would you like to provide responses on this issue of concern? *(Please select only 1 option below. If you select a "No" option, you may move to the next issue of concern, Phthalates)*

- Yes
- No, I do not know enough about this issue
- No, this issue is not relevant to my country or institution
- No, other

- a. If you selected "No, other" in the previous question, please elaborate here:

The scientific community has access to a large amount of evidence on the effects and impacts of organotins in humans and wildlife, but the body of scientific evidence is too large for the RSC to provide any technical evaluations and conclusions on these substances at this point in time.

The RSC may be able to connect UNEP to international scientific experts on organotin chemistry and toxicity if required.

Examples of the type of science and technology evidence that is available is:

[The effects of organotin on female gastropods - Journal of Environmental Monitoring \(RSC Publishing\) 2011, 13, 2360-2388. <https://doi.org/10.1039/C1EM10011D>](#)

9. Phthalates

Screening Question - Phthalates

Phthalates are a large family of semi-volatile organic compounds. They are a group of plasticizers with softening and elastic effects, and they are produced in high volumes to be used in products such as vinyl flooring, adhesives, detergents, lubricating oils, automotive plastics, plastic clothing and personal care products. Phthalates accounted for 65 per cent of global consumption of plasticizers in 2017.

Please visit the two-page factsheet on [Phthalates](#) for more information on the topic.

1. **Entry question:** Would you like to provide responses on this issue of concern? *(Please select only 1 option below. If you select a "No" option, you may move to the next issue of concern, Polycyclic Aromatic Hydrocarbons (PAHs))*

- Yes
- No, I do not know enough about this issue
- No, this issue is not relevant to my country or institution
- No, other

- a. If you selected "No, other" in the previous question, please elaborate here:

The scientific community has access to a large amount of evidence on the effects and impacts of phthalates in humans and wildlife, but the body of scientific evidence is too large for the RSC to provide any technical evaluations and conclusions on these substances at this point in time.

There appears to be differences of views in different parts of the world on the interpretation of the scientific evidence for phthalates that requires further investigation and discussion to reach globally harmonised conclusions.

The RSC may be able to connect UNEP to international scientific experts on phthalate chemistry and toxicity if required.

Examples of the type of science and technology evidence that is available is:

[Association of phthalate exposure with precocious and delayed pubertal timing in girls and boys: a systematic review and meta-analysis - Environmental Science: Processes & Impacts \(RSC Publishing\)](#) 2020, 22, 873-894. <https://doi.org/10.1039/C9EM00512A>

[Major contaminants of emerging concern in soils: a perspective on potential health risks - RSC Advances \(RSC Publishing\)](#) 2022, 12, 12396-12415. <https://doi.org/10.1039/D1RA09072K>

[Organophosphate and phthalate esters in indoor air: a comparison between multi-storey buildings with high and low prevalence of sick building symptoms - Journal of Environmental Monitoring \(RSC Publishing\)](#) 2011, 13, 2001-2009. <https://doi.org/10.1039/C1EM10152H>

Provision of authoritative review of the globally available evidence could in principle be performed by a new science-policy panel for chemicals, waste and pollution prevention?

10. Polycyclic Aromatic Hydrocarbons (PAHs)

Screening Question - Polycyclic Aromatic Hydrocarbons (PAHs)

Polycyclic aromatic hydrocarbons (PAHs) are a class of more than 100 organic compounds. They occur naturally in coal and crude oil, but are also formed as a by-product during the incomplete combustion from both natural (e.g. volcanic eruptions, burning of coal, oil and gas) or anthropogenic (e.g. vehicle emissions, industrial processes, food preparation) sources. PAHs may also be present in consumer products (e.g. plastic components, footwear); however, they are never intentionally added during manufacturing. Plant-based foods may contain PAHs as a result of pollutant deposition before harvest.

Please visit the two-page factsheet on [Polycyclic Aromatic Hydrocarbons](#) for more information on the topic.

1. **Entry question:** Would you like to provide responses on this issue of concern? (*Please select only 1 option below. If you select a "No" option, you may move to the next issue of concern, Triclosan*)

- Yes
- No, I do not know enough about this issue
- No, this issue is not relevant to my country or institution
- No, other

- a. If you selected "No, other" in the previous question, please elaborate here:

The scientific community has access to a large amount of evidence on the effects and impacts of PAHs in humans and wildlife, but the body of scientific evidence is too large for the RSC to provide any technical evaluations and conclusions on these substances at this point in time. The toxicity of PAHs is well understood and there appears generally to be consensus on the scientific evidence.

Whilst there is consensus that PAHs are known carcinogens, there appears to be differences in the approach to risk assessment of PAHs in different parts of the world that requires further investigation and discussion to reach globally harmonised conclusions.

The RSC may be able to connect UNEP to international scientific experts on PAH chemistry and toxicity if required.

Examples of the type of science and technology evidence that is available is

[Chemical reactivity and long-range transport potential of polycyclic aromatic hydrocarbons – a review - Chemical Society Reviews \(RSC Publishing\) 2013, 42, 9333-9391. <https://doi.org/10.1039/C3CS60147A>](#)

[Anthropogenic PAHs in lake sediments: a literature review \(2002–2018\) - Environmental Science: Processes & Impacts \(RSC Publishing\) 2018, 20, 1649-1666. <https://doi.org/10.1039/C8EM00195B>](#)

Provision of authoritative review of the globally available [practices on risk assessment](#) could in principle be performed by a new science-policy panel for chemicals, waste and pollution prevention?

11. Triclosan

Screening Question - Triclosan

Triclosan is a synthetic, broad-spectrum antibacterial chemical used as an additive in thousands of consumer and medical antibacterial products and plastics. It has been used commercially across the globe since the 1970s. Major global use is in cosmetics and personal care products (68%, particularly deodorants) followed by disinfection and medical use (16%) and lower amounts in paints (8%), and in plastic materials, toys and appliances (8%).

Please visit the two-page factsheet on [Triclosan](#) for more information on the topic.

1. **Entry question:** Would you like to provide responses on this issue of concern? *(Please select only 1 option below. If you select a "No" option, you may move to the next issue of concern, Chemicals in Products (CiP))*

- Yes
- No, I do not know enough about this issue
- No, this issue is not relevant to my country or institution
- No, other

- a. If you selected "No, other" in the previous question, please elaborate here:

The scientific community has access to a large amount of evidence on triclosan toxicity and its impacts on humans and the environment, but the body of scientific evidence is too large for the RSC to provide any technical evaluations and conclusions on this individual substance at this point in time. The effects of triclosan are well understood and there appears generally to be consensus on the scientific evidence.

The RSC may be able to connect UNEP to international scientific experts on triclosan chemistry and toxicity if required.

Examples of the type of science and technology evidence that is available is:

[Dose–response assessment of the dermal toxicity of triclosan in B6C3F1 mice - Toxicology Research \(RSC Publishing\) 2015, 4, 867-877. <https://doi.org/10.1039/C4TX00152D>](#)

12. Chemicals in products (CiP)

Screening Question - Chemicals in products (CiP)

Chemicals may be released at any stage of a product's life cycle (including production, use, recycling or reuse, end-of-life disposal), resulting in potential exposures for humans and the environment.

Information exchange in the value chain is fundamental for manufacturers, brands, retailers, end-consumers, waste managers and regulators in identifying and soundly managing any chemicals of technical, environmental or human health concerns in products.

CiP was identified as an issue of concern under SAICM at ICCM2 in 2009, "with a view of taking appropriate cooperative actions, to consider the need to improve the availability of and access to information on chemicals in products in the supply chain and throughout their life cycle". SAICM stakeholders also identified four priority sectors: textiles, toys, building products and electronics.

Please visit the two-page factsheet on [Chemicals in Products](#) for more information on the topic.

1. **Entry question:** Would you like to provide responses on this issue of concern? *(Please select only 1 option below. If you select a "No" option, you may move to the next issue of concern, Endocrine-disrupting chemicals (EDCs))*

- Yes
- No, I do not know enough about this issue
- No, this issue is not relevant to my country or institution
- No, other

- a. If you selected "No, other" in the previous question, please elaborate here:

Technical Questions - Chemicals in products (CiP)

Chemicals may be released at any stage of a product's life cycle (including production, use, recycling or reuse, end-of-life disposal), resulting in potential exposures for humans and the environment. Information exchange in the value chain is fundamental for manufacturers, brands, retailers, end-consumers, waste managers and regulators in identifying and soundly managing any chemicals of technical, environmental or human health concerns in products.

CiP was identified as an issue of concern under SAICM at ICCM2 in 2009, "with a view of taking appropriate cooperative actions, to consider the need to improve the availability of and access to information on chemicals in products in the supply chain and throughout their life cycle". SAICM stakeholders also identified four priority sectors: textiles, toys, building products and electronics.

Please visit the two-page factsheet on [Chemicals in Products](#) for more information on the topic.

Please answer the questions below that are relevant to your organization/ country/ region:

1. Do you agree with the assessment report that further international action is necessary*? *(If you select "No", you are welcome to answer the questions below or you may proceed directly to question 9)*

- Yes
- No
- Do not know

- a. Please provide a brief explanation for your response*. The presence and disposal of hazardous chemicals in products is causing global pollution issues. This is a challenging question set to answer as there are millions of products being sold to millions of consumers everyday, globally. There needs to be a **prioritisation framework** for deciding which are the most urgent, risky and impactful products and processes that need action.

2. What types of international actions should be taken? *(Multiple answers based on the catalogue of action, Please refer to the [catalogue of international actions](#) prepared by UNEP for more information on available options).*

- Legally binding*
- Soft law*
- Information sharing and awareness/ Voluntary initiatives*
- No international actions are needed*
- Other: **Development of a prioritisation framework** to identify the most urgent and impactful issues relating to chemicals in products. Provision of authoritative review and consistent global evidence from a new science-policy panel for chemicals, waste and pollution prevention.*

- a. Please explain your response, including examples if possible*.
A toolbox of actions is needed depending on the risk and impacts of hazardous chemicals and the source-pathway- receptor situation. Highly hazardous chemicals require more legally binding actions than less hazardous/risky chemicals.

There are so many hazardous substances as chemicals in products, priority should be given to those that bring the greatest risks and impacts.

3. Which type of approach or measure would you see as appropriate to address this issue at the international level? *(Multiple answers based on the catalogue of action, Please refer to the [catalogue of international actions](#) prepared by UNEP for more information on available options).*

- Regulatory control measures*
- Information based and enforcement tools (such as Scientific and technical and guidelines, Guidelines and tools for enforcement, Awareness tools (including of consumers))*
- Options / guidance for economic instruments*
- Voluntary measures and approaches: (such as Guidelines, principles and strategies)*
- Measures supporting science-based knowledge and research*
- Other: _____*

a. Please explain your response, including examples if possible: **A toolbox of actions is needed depending on the risk and impacts of hazardous chemicals and the source-pathway-receptor situation. Highly hazardous chemicals require more regulatory control measures than less hazardous/risky chemicals.**

4. What factors prevent action/progress on addressing the issue in your country/ organization *(Multiple answers based on list below)?*

- Lack of technical capacity*
- Lack of scientific knowledge*
- Difficulties in sharing knowledge and coordinating action among different stakeholders and across sectors*
- Difficulty with resource mobilisation*
- Lack of economically feasible green and sustainable alternatives*
- Only coordinated international action can address the issue (e.g., due to transboundary effects, or prevalence of chemicals in international trade)?*
- None, there are no factors preventing action or progress*
- Other: _____*

a. Please explain your response, including examples if possible: _____

5. Can you point to existing initiatives that could be replicated or scaled up at the international level? *(Open space answer. Please share a weblink to the initiative(s) if available).*

For information, the UK government is currently performing a consultation for a large Product Safety Review that is intended to be risk-based.

[Smarter regulation: UK product safety review - GOV.UK \(www.gov.uk\)](http://www.gov.uk)

6. Which sectors/value chains need to be closely involved in developing solutions? *(Multi-choice. Please visit the two-page factsheet on [Chemicals in Products](#) for more information on the topic. If you select "Other", please elaborate your response).*

- ✓ *Agriculture and food production*
- ✓ *Construction*
- ✓ *Electronics*
- ✓ *Energy*
- ✓ *Health*
- ✓ *Labour*
- ✓ *Pharmaceuticals*
- ✓ *Public, private, blended finance*
- ✓ *Retail*
- ✓ *Textiles*
- ✓ *Transportation*
- ✓ *Waste*
- ✓ *Other: Consumer Products*

7. Which international forum or instrument would be best placed to take the lead on international action on this issue? *(Open space to elaborate. Please provide specific examples of e.g., intergovernmental bodies, multilateral agreements within or outside the chemicals and waste cluster, international instruments...).*

a. Which international agendas have important linkages with this issue of concern? *(Multiple answers based on list below. For more information, please see the [UNEP assessment paper on linkages with other clusters related to chemicals and waste](#)):*

- ✓ *Agriculture and Food*
- ✓ *Biodiversity*
- ✓ *Climate Change*
- ✓ *Health*
- ✓ *Human Rights*
- ✓ *Sustainable Consumption and Production*
- ✓ *World of Work*
- Other: _____*

b. Please explain your response, including examples if possible. *(Open space question. For more information, please see the [UNEP assessment paper on linkages with other clusters related to chemicals and waste](#)):*

Chemicals in Products is more of an overarching Theme, with sub-themes of the other issues for prioritisation beneath. All sectors have interests in chemicals in products.

8. What priority level do you attach to this issue for international action?

- Very high*
- High*
- Medium*
- Low*
- Very low*

9. Is there any priority further work you would like to suggest at the national level*? (*Open space to elaborate. Please share a weblink to the suggestion(s) if available.*)

The UK government is currently performing a consultation for a large Product Safety Review that is intended to be risk-based.

[Smarter regulation: UK product safety review - GOV.UK \(www.gov.uk\)](https://www.gov.uk)

The RSC has recently produced a report on Polymers in Liquid Formulations: this is an emerging area that may sit under Chemicals in Products.

[Polymers in Liquid Formulations \(PLFs\) \(rsc.org\)](https://www.rsc.org)

10. Is there any priority further work you would like to suggest at the regional level*? (*Open space to elaborate. Please share a weblink to the suggestion(s) if available.*)

13. Endocrine-disrupting chemicals (EDCs)

Screening Question - Endocrine-disrupting chemicals (EDCs)

An EDC is an exogenous substance or mixture that alters the function(s) of the endocrine system and consequently causes adverse health effects in an intact organism, or its progeny, or (sub)populations. Substantial efforts have been made over the past two decades to develop a better scientific understanding of EDCs and their characteristics, to test and identify EDCs, and to develop scientific approaches in order to support risk management measures.

In 2012, at ICCM3, EDCs were identified as an issue of concern under SAICM, and SAICM stakeholders decided “to implement cooperative actions on endocrine-disrupting chemicals with the overall objective of increasing awareness and understanding among policymakers and other stakeholders” and invited IOMC organisations to lead and facilitate a series of cooperative actions on EDCs, which was renewed in a Resolution at ICCM4.

Please visit the two-page factsheet on [Endocrine Disrupting Chemicals](#) for more information on the topic.

1. **Entry question:** Would you like to provide responses on this issue of concern? *(Please select only 1 option below. If you select a "No" option, you may move to the next issue of concern, Environmentally Persistent Pharmaceutical Pollutants (EPPPs))*

- Yes
- No, I do not know enough about this issue
- No, this issue is not relevant to my country or institution
- No, other

- b. If you selected "No, other" in the previous question, please elaborate here:

Technical Questions - Endocrine-disrupting chemicals (EDCs)

An EDC is an exogenous substance or mixture that alters the function(s) of the endocrine system and consequently causes adverse health effects in an intact organism, or its progeny, or (sub)populations. Substantial efforts have been made over the past two decades to develop a better scientific understanding of EDCs and their characteristics, to test and identify EDCs, and to develop scientific approaches in order to support risk management measures.

In 2012, at ICCM3, EDCs were identified as an issue of concern under SAICM, and SAICM stakeholders decided “to implement cooperative actions on endocrine-disrupting chemicals with the overall objective of increasing awareness and understanding among policymakers and other stakeholders” and invited IOMC organisations to lead and facilitate a series of cooperative actions on EDCs, which was renewed in a Resolution at ICCM4.

Please visit the two-page factsheet on [Endocrine Disrupting Chemicals](#) for more information on the topic.

Please answer the questions below that are relevant to your organization/ country/ region:

1. Do you agree with the assessment report that further international action is necessary*? *(If you select "No", you are welcome to answer the questions below or you may proceed directly to question 9)*

- Yes
 No
 Do not know

- a. Please provide a brief explanation for your response*. *In order to facilitate international trade, it is important to reach a harmonised global position about the evidence on the effects/or otherwise of endocrine disrupting substances.*

2. What types of international actions should be taken? *(Multiple answers based on the catalogue of action, Please refer to the [catalogue of international actions](#) prepared by UNEP for more information on available options).*

- Legally binding*
 Soft law
 Information sharing and awareness/ Voluntary initiatives
 No international actions are needed
 Other: Provision of authoritative review of the globally available evidence could in principle be performed by a new science-policy panel for chemicals, waste and pollution prevention?

- a. Please explain your response, including examples if possible*. _____

3. Which type of approach or measure would you see as appropriate to address this issue at the international level? *(Multiple answers based on the catalogue of action, Please refer to the [catalogue of international actions](#) prepared by UNEP for more information on available options).*

- ✓ *Regulatory control measures*
- ✓ *Information based and enforcement tools (such as Scientific and technical and guidelines, Guidelines and tools for enforcement, Awareness tools (including of consumers))*
- Options / guidance for economic instruments*
- ✓ *Voluntary measures and approaches: (such as Guidelines, principles and strategies)*
- ✓ *Measures supporting science-based knowledge and research*
- Other: _____*

a. Please explain your response, including examples if possible:

There is not yet scientific consensus in the world about how to risk assess and risk manage endocrine disrupting chemicals. There is emergent science.

Further research is needed on how endocrine active substances cause adverse effects in intact organisms. Like carcinogens, mutagens and reproductive toxicants (CMRs), the action of chemicals that can act as endocrine disruptors can be insidious in nature, goes unseen and is difficult to relate exposure, cause and effect. Nevertheless it is understood that EDCs can in principle cause certain serious consequences in human beings and environmental species when exposure to them is during critical time windows of reproduction and development e.g. during fetal and child development, or when effects on male sperm or female reproductive system/hormones are seen. It is important to adopt the WHO IPCS definition of an endocrine disruptor; many chemicals show endocrine activity in in vitro systems but these observations do not always carry through to adverse effects in an intact organism. A risk-based approach to regulation and policy can be taken for EDCs.

See [edc-policy-position-final-sep-2020.pdf \(rsc.org\)](#) September 2020

[endocrine-disrupting-chemicals---ttb-2022.pdf \(rsc.org\)](#) RSC Toxicology Group, June 2022.

There is a balance here in the need for precautionary action in the absence of scientific evidence, and regulatory control where science has definitively established a substance as an EDC causing adverse effects. Suspicion alone of being an EDC should not always lead to regulatory action.

4. What factors prevent action/progress on addressing the issue in your country/ organization *(Multiple answers based on list below)?*

- ✓ *Lack of technical capacity*
- ✓ *Lack of scientific knowledge*
- ✓ *Difficulties in sharing knowledge and coordinating action among different stakeholders and across sectors*

- ✓ *Difficulty with resource mobilisation*
- Lack of economically feasible green and sustainable alternatives*
- ✓ *Only coordinated international action can address the issue (e.g., due to transboundary effects, or prevalence of chemicals in international trade)?*
- None, there are no factors preventing action or progress*
- Other: Scientific disagreements on the technical interpretation of evidence.*

a. Please explain your response, including examples if possible:

The biggest challenge is scientific differences of opinion in this field and controversial views about the evidence. There is a significant difference of opinion between scientists across the world as to whether EDCs can be risk assessed like other chemicals in the normal way. There is the proposition by some scientists based on some observations, that EDCs do not follow the classical toxicological paradigm that we have worked to for a century or more, that the dose makes the poison. For EDCs, there is the hypothesis that this classical paradigm does not hold true, and that non-monotonic dose responses (NMDR) exist – which means that even very low exposures can lead to more harm than higher doses. This is a scientifically controversial view but has a very big impact on how regulation and policy is set. More research and international and harmonised positions need to be developed for consistent global policy and regulatory action.

The following papers are a handful that illustrate the different views in the scientific community on the potential for adverse impacts from EDCs. A full and comprehensive review is needed to inform the most appropriate regulatory action. Or whether the Precautionary Principle should be implemented when the science is uncertain.

[Lack of association between endocrine disrupting chemicals and male fertility: A systematic review and meta-analysis - PubMed \(nih.gov\)](#)

[Hormones and endocrine-disrupting chemicals: low-dose effects and nonmonotonic dose responses - PubMed \(nih.gov\)](#)

[Scientific principles for the identification of endocrine-disrupting chemicals: a consensus statement - PubMed \(nih.gov\)](#)

[Executive Summary to EDC-2: The Endocrine Society's Second Scientific Statement on Endocrine-Disrupting Chemicals - PubMed \(nih.gov\)](#)

[The regulation of endocrine-disrupting chemicals to minimize their impact on health - PubMed \(nih.gov\)](#)

[Endocrine Disruptor Chemicals and Children's Health - PubMed \(nih.gov\)](#)

5. Can you point to existing initiatives that could be replicated or scaled up at the international level? *(Open space answer. Please share a weblink to the initiative(s) if available).*

Provision of authoritative review of the globally available evidence could in principle be performed by a new science-policy panel for chemicals, waste and pollution prevention?

6. Which sectors/value chains need to be closely involved in developing solutions? *(Multi-choice. Please visit the two-page factsheet on [Endocrine Disrupting Chemicals](#) for more information on the topic. If you select "Other", please elaborate your response).*

- Agriculture and food production*
- Construction*
- Electronics*
- Energy*
- Health*
- Labour*
- Pharmaceuticals*
- Public, private, blended finance*
- Retail*
- Textiles*
- Transportation*
- Waste*
- Other: Science & Technology sector*

7. Which international forum or instrument would be best placed to take the lead on international action on this issue? *(Open space to elaborate. Please provide specific examples of e.g., intergovernmental bodies, multilateral agreements within or outside the chemicals and waste cluster, international instruments...).*

The new Science-Policy Panel on Chemicals, Waste and Pollution Prevention under UNEA 5/8

- a. Which international agendas have important linkages with this issue of concern? *(Multiple answers based on list below. For more information, please see the [UNEP assessment paper on linkages with other clusters related to chemicals and waste](#)):*

- Agriculture and Food*
- Biodiversity*
- Climate Change*
- Health*
- Human Rights*
- Sustainable Consumption and Production*
- World of Work*
- Other: _____*

- b. Please explain your response, including examples if possible. *(Open space question. For more information, please see the [UNEP assessment paper on linkages with other clusters related to chemicals and waste](#)):*

8. What priority level do you attach to this issue for international action?

- Very high*
- High*
- Medium*
- Low*
- Very low*

9. Is there any priority further work you would like to suggest at the national level*? (*Open space to elaborate. Please share a weblink to the suggestion(s) if available.*)

Harmonising consistent approaches for EDCs and technical guidance in product regulations. Current guidance and regulations can be divergent and inconsistent.

10. Is there any priority further work you would like to suggest at the regional level*? (*Open space to elaborate. Please share a weblink to the suggestion(s) if available.*)

14. Environmentally Persistent Pharmaceutical Pollutants (EPPPs)

Screening Question - Environmentally Persistent Pharmaceutical Pollutants (EPPPs)

Pharmaceuticals, including antibiotics, and their metabolites can enter the environment through a variety of pathways, including wastewater and solid waste from pharmaceutical manufacturing, consumption and excretion, improper disposal of unused or expired products, animal husbandry and aquafarming. Their presence in the environment may result in different adverse effects on wildlife and ecosystems; some well-known cases include endangerment of some vulture species, reproductive failures in fish, and the development of antimicrobial resistance.

Internationally, EPPPs were recognized as an issue of concern under SAICM at ICCM4 in 2015. The same resolution “considers that information dissemination and awareness-raising on EPPP are particularly relevant and that improving the availability of and access to information on such chemicals is a priority”, “recognizes the current knowledge gaps on exposure to and the effects of EPPP”, “decides to implement cooperative actions on EPPP with the overall objective of increasing awareness and understanding among policymakers and other stakeholders”, and “requests all interested stakeholders and organizations to provide support, including expertise, financial and in-kind resources, on a voluntary basis, for such cooperative action, including by participating in developing and making available relevant information and guidance”

Please visit the two-page factsheet on [Environmentally Persistent Pharmaceutical Pollutants](#) for more information on the topic.

1. **Entry question:** Would you like to provide responses on this issue of concern? *(Please select only 1 option below. If you select a "No" option, you may move to the next issue of concern, Hazardous substances within the life cycle of electrical and electronic products (HSLEEP))*

- Yes
- No, I do not know enough about this issue
- No, this issue is not relevant to my country or institution
- No, other

- a. If you selected "No, other" in the previous question, please elaborate here:

The scientific community has access to a large amount of evidence on the effects and impacts of pharmaceutical pollutants in humans and wildlife, but the body of scientific evidence is too large for the RSC to provide any technical evaluations and conclusions on these substances at this point in time. The toxicity of pollutant pharmaceuticals can be diverse and varied in terms of potential end effects and are not well understood.

The RSC may be able to connect UNEP to international scientific experts on pharmaceutical pollutant chemistry and toxicity if required.

Examples of the type of science and technology evidence that is available is

[Photocatalytic pathway toward degradation of environmental pharmaceutical pollutants: structure, kinetics and mechanism approach - Catalysis Science & Technology \(RSC Publishing\)](#) 2017, 7, 4548-4569. <https://doi.org/10.1039/C7CY00468K>

15. Hazardous substances within the life cycle of electrical and electronic products (HSLEEP)

Screening Question - Hazardous substances within the life cycle of electrical and electronic products (HSLEEP)

Electrical and electronic products (EEP), also referred to as electronic and electrical equipment (EEE), include any device with a circuit, battery or plug. They can contain many chemical additives for certain properties such as flame retardancy. Some chemical additives may be hazardous, including heavy metals and persistent organic pollutants (POPs), and may be released during production, use, transport, and end-of-life treatment (disposal or recycling), leading to environmental and human exposures and possible adverse effects.

HSLEEP was adopted as an EPI at ICCM2 in 2009. Conscious that actions are needed up-, mid- and downstream, a life cycle approach was endorsed. Despite valuable efforts made at all levels, significant challenges remain in regard to identifying, disseminating and implementing best practices at all stages of the life cycle, including design, recycling and disposal.

Please visit the two-page factsheet on [Hazardous Substances within the Life cycle of Electrical and Electronic Products](#) for more information on the topic.

1. **Entry question:** Would you like to provide responses on this issue of concern? *(Please select only 1 option below. If you select a "No" option, you may move to the next issue of concern, Highly Hazardous Pesticides (HHPs))*

- Yes
- No, I do not know enough about this issue
- No, this issue is not relevant to my country or institution
- No, other

- a. If you selected "No, other" in the previous question, please elaborate here:

Electrical and electronic products (EEP), also referred to as electronic and electrical equipment (EEE), include any device with a circuit, battery or plug. They can contain many chemical additives for certain properties such as flame retardancy. Some chemical additives may be hazardous, including heavy metals and persistent organic pollutants (POPs), and may be released during production, use, transport, and end-of-life treatment (disposal or recycling), leading to environmental and human exposures and possible adverse effects.

HSLEEP was adopted as an EPI at ICCM2 in 2009. Conscious that actions are needed up-, mid- and downstream, a life cycle approach was endorsed. Despite valuable efforts made at all levels, significant challenges remain in regard to identifying, disseminating and implementing best practices at all stages of the life cycle, including design, recycling and disposal.

Please visit the two-page factsheet on [Hazardous Substances within the Life cycle of Electrical and Electronic Products](#) for more information on the topic.

Please answer the questions below that are relevant to your organization/ country/ region:

1. Do you agree with the assessment report that further international action is necessary*? *(If you select "No", you are welcome to answer the questions below or you may proceed directly to question 9)*

- Yes
 No
 Do not know

- a. Please provide a brief explanation for your response*.

Innovation is going to depend on the use of hazardous substances in electronic products for performance, functionality and safety. Electronic waste is the fastest growing waste stream globally and, if incorrectly processed/disposed, it poses significant risks to human health and the environment.

[RSCPolicyPosition-Critical-raw-materials-in-waste-electrical-and-electronic-equipment](#)

[Precious Elements Home \(rsc.org\)](#) Themed collection

2. What types of international actions should be taken? *(Multiple answers based on the catalogue of action, Please refer to the [catalogue of international actions](#) prepared by UNEP for more information on available options).*

- Legally binding*
 Soft law
 Information sharing and awareness/ Voluntary initiatives
 No international actions are needed
 Other: Provision of authoritative review and consistent global evidence from a new science-policy panel for chemicals, waste and pollution prevention.

- a. Please explain your response, including examples if possible*. _____

Effective implementation of the Basel convention – and potentially the Science-Policy Panel on Chemicals, Waste and the Prevention of Pollution – will play an important role in stemming the e-waste tide, in particular in countries not set up to deal safely with this growing waste stream. In addition, soft law initiatives, awareness raising and voluntary initiatives to establish principles and tools to deal with and prevent e-waste will be useful.

3. Which type of approach or measure would you see as appropriate to address this issue at the international level? *(Multiple answers based on the catalogue of action, Please refer to the [catalogue of international actions](#) prepared by UNEP for more information on available options).*

- Regulatory control measures*
- Information based and enforcement tools (such as Scientific and technical and guidelines, Guidelines and tools for enforcement, Awareness tools (including of consumers))*
- Options / guidance for economic instruments*
- Voluntary measures and approaches: (such as Guidelines, principles and strategies)*
- Measures supporting science-based knowledge and research*
- Other: _____*

a. Please explain your response, including examples if possible: _____

4. What factors prevent action/progress on addressing the issue in your country/ organization *(Multiple answers based on list below)?*

- Lack of technical capacity*
- Lack of scientific knowledge*
- Difficulties in sharing knowledge and coordinating action among different stakeholders and across sectors*
- Difficulty with resource mobilisation*
- Lack of economically feasible green and sustainable alternatives*
- Only coordinated international action can address the issue (e.g., due to transboundary effects, or prevalence of chemicals in international trade)?*
- None, there are no factors preventing action or progress*
- Other: _____*

a. Please explain your response, including examples if possible: _____

5. Can you point to existing initiatives that could be replicated or scaled up at the international level? *(Open space answer. Please share a weblink to the initiative(s) if available).*

Provision of authoritative review of the globally available evidence could in principle be performed by a new science-policy panel for chemicals, waste and pollution prevention?

6. Which sectors/value chains need to be closely involved in developing solutions? *(Multi-choice. Please visit the two-page factsheet on [Hazardous Substances within the Life cycle of Electrical and Electronic Products](#) for more information on the topic. If you select "Other", please elaborate your response).*

- Agriculture and food production
- Construction
- ✓ Electronics
- ✓ Energy
- ✓ Health
- Labour
- Pharmaceuticals
- Public, private, blended finance
- Retail
- Textiles
- Transportation
- ✓ Waste
- Other: _____

Viable solutions will require the electronics, waste management sector, product design, materials scientists, the primary and mid-stream extraction and processing sector and manufacturers to work together.

7. Which international forum or instrument would be best placed to take the lead on international action on this issue? *(Open space to elaborate. Please provide specific examples of e.g., intergovernmental bodies, multilateral agreements within or outside the chemicals and waste cluster, international instruments...).*

a. Which international agendas have important linkages with this issue of concern? *(Multiple answers based on list below. For more information, please see the [UNEP assessment paper on linkages with other clusters related to chemicals and waste](#)):*

- Agriculture and Food
- ✓ Biodiversity
- Climate Change
- ✓ Health
- ✓ Human Rights
- ✓ Sustainable Consumption and Production
- World of Work
- Other: _____

b. Please explain your response, including examples if possible. *(Open space question. For more information, please see the [UNEP assessment paper on linkages with other clusters related to chemicals and waste](#)):*

There are direct linkages between HSLEEP and health, biodiversity and human rights (e.g. mismanaged e-waste and unsafe manufacturing can have significant impacts on human health and the environment, in particular in less-developed contexts). In addition, there is a link to sustainable consumption and

production, with the use of electronic products accelerating and e-waste being the fastest growing waste stream globally.

8. What priority level do you attach to this issue for international action?

- Very high*
- High*
- Medium*
- Low*
- Very low*

9. Is there any priority further work you would like to suggest at the national level*? (*Open space to elaborate. Please share a weblink to the suggestion(s) if available.*)

Greater investment in appropriate recycling infrastructure and sustainable alternatives

10. Is there any priority further work you would like to suggest at the regional level*? (*Open space to elaborate. Please share a weblink to the suggestion(s) if available.*)

Greater coordination around eco-design, waste management, and finding suitable alternatives to HSLEEP.

16. Highly hazardous pesticides (HHPs)

Screening Question - Highly hazardous pesticides (HHPs)

The FAO and WHO International Code of Conduct on Pesticide Management defines HHPs as: “Pesticides that are acknowledged to present particularly high levels of acute or chronic hazards to health or environment according to internationally accepted classification systems such as the WHO or the Globally Harmonized System of Classification and Labelling of Chemicals (GHS) or their listing in relevant binding international agreements or conventions. In addition, pesticides that appear to cause severe or irreversible harm to health or the environment under conditions of use in a country may be considered to be and treated as highly hazardous”.

At ICCM4 in 2015, HHPs were identified as an issue of concern. In addition, among other actions, governments and other stakeholders supported “concerted action to address HHPs in the context of SAICM” and encouraged “relevant stakeholders to undertake concerted efforts to implement the strategy at the local, national, regional and international levels, with emphasis on promoting agroecologically-based alternatives and strengthening national regulatory capacity to conduct risk assessment and risk management, including the availability of necessary information, mindful of the responsibility of national and multinational enterprises”, and welcomed “the offer of the FAO, UNEP and WHO to develop modalities for international coordination in the context of the IOMC”

Please visit the two-page factsheet on [Highly Hazardous Pesticides](#) for more information on the topic.

1. **Entry question:** Would you like to provide responses on this issue of concern? *(Please select only 1 option below. If you select a "No" option, you may move to the next issue of concern, Lead in Paint)*

- Yes
- No, I do not know enough about this issue
- No, this issue is not relevant to my country or institution
- No, other

- a. If you selected "No, other" in the previous question, please elaborate here:

The scientific community has access to a large amount of evidence on pesticide toxicity and its impacts on humans and the environment, but the body of scientific evidence is too large for the RSC to provide any technical evaluations and conclusions on this individual substance at this point in time.

The RSC may be able to connect UNEP to international scientific experts on pesticide chemistry and toxicity if required.

17. Lead in paint

Screening Question - Lead in paint

Lead is a multi-system toxicant for which no safe level of exposure has been identified. Exposure to lead can cause chronic and debilitating health impacts in all age groups, and children are particularly vulnerable to its neurotoxic effects. The widespread use of lead has caused extensive environmental and human exposure across the globe. One major source of exposure, particularly for children, is through “lead paint”, or paint to which lead compounds have been added as pigments, drying agents or anti-corrosives.

Among others, “Lead in Paint” was recognized as an issue of concern under the second session of the International Conference on Chemicals Management (ICCM2) in 2009. The ICCM2 also endorsed the establishment of an international partnership, the Global Alliance to Eliminate Lead Paint (GAELP), to assist in phasing out lead paint worldwide. The GAELP aims to have all countries adopt “legally binding laws, regulations, standards and/or procedures to control the production, import, sale and use of lead paints with special attention to the elimination of lead decorative paints and lead paints for other applications most likely to contribute to childhood lead exposure” and to have all paint manufacturers eliminate “the use of added lead compounds in priority areas” by 2020.

Please visit the two-page factsheet on [Lead in Paint](#) for more information on the topic.

1. **Entry question:** Would you like to provide responses on this issue of concern? *(Please select only 1 option below. If you select a "No" option, you may move to the next issue of concern, Nanotechnology and manufactured nanomaterials)*

- Yes
- No, I do not know enough about this issue
- No, this issue is not relevant to my country or institution
- No, other

- a. If you selected "No, other" in the previous question, please elaborate here:

The RSC recognises this as an important issue that already has clear policy actions in some parts of the world e.g. USA. The scientific community has access to a large amount of evidence on lead (Pb) toxicity and its impacts on humans and the environment, but the body of scientific evidence is too large for the RSC to provide any technical evaluations and conclusions on this individual substance at this point in time. The toxicity of lead (Pb) is well understood and there appears generally to be consensus on the scientific evidence. There may be some differences globally in the interpretation of evidence in the area of neurodevelopmental effects in children.

The RSC may be able to connect UNEP to international scientific experts on lead (Pb) chemistry and toxicity if required.

Examples of the type of science and technology evidence that is available are:

Lead exposure in children *British Medical Journal* 2022; 377 doi: <https://doi.org/10.1136/bmj-2020-063950> (Published 07 April 2022) Cite this as: *BMJ* 2022;377:e063950

18. Nanotechnology and manufactured nanomaterials

Screening Question - Nanotechnology and manufactured nanomaterials

While no definition has been internationally agreed upon, nanomaterials are commonly defined as materials having at least one external or internal dimension between 1 and 100 nm. Nanotechnology, i.e. the manipulation of matter at the nanometre scale, has rapidly developed in the past few decades and led to the widespread presence of nanomaterials in consumer products and industrial applications.

Despite multiple benefits associated with the technology, concerns have emerged regarding potential risks posed by manufactured nanomaterials to human health and the environment. In light of these concerns “Nanotechnology and manufactured nanomaterials” was designated an emerging policy issue at the second session of the ICCM in 2009. Stakeholders stressed the need to close knowledge gaps; to understand, avoid, reduce and manage risks; and to review the methods used for testing and assessing safety.

Please visit the two-page factsheet on [Nanotechnology and manufactured nanomaterials](#) for more information on the topic.

1. **Entry question:** Would you like to provide responses on this issue of concern? *(Please select only 1 option below. If you select a "No" option, you may move to the next issue of concern, Per- and polyfluoroalkyl substances (PFASs))*

- Yes
- No, I do not know enough about this issue
- No, this issue is not relevant to my country or institution
- No, other

- a. If you selected "No, other" in the previous question, please elaborate here:

While no definition has been internationally agreed upon, nanomaterials are commonly defined as materials having at least one external or internal dimension between 1 and 100 nm. Nanotechnology, i.e. the manipulation of matter at the nanometre scale, has rapidly developed in the past few decades and led to the widespread presence of nanomaterials in consumer products and industrial applications.

Despite multiple benefits associated with the technology, concerns have emerged regarding potential risks posed by manufactured nanomaterials to human health and the environment. In light of these concerns “Nanotechnology and manufactured nanomaterials” was designated an emerging policy issue at the second session of the ICCM in 2009. Stakeholders stressed the need to close knowledge gaps; to understand, avoid, reduce and manage risks; and to review the methods used for testing and assessing safety.

Please visit the two-page factsheet on [Nanotechnology and manufactured nanomaterials](#) for more information on the topic.

Please answer the questions below that are relevant to your organization/ country/ region:

1. Do you agree with the assessment report that further international action is necessary*? *(If you select "No", you are welcome to answer the questions below or you may proceed directly to question 9)*

- Yes
 No
 Do not know

- a. Please provide a brief explanation for your response*.

Emergent area: not enough evidence on exposure to nanomaterials and inherent toxicity profiles to know whether they present a real risk but international work will help progress this complex technical area in a harmonised way.

[Environmental Nanopollutants Sources, Occurrence, Analysis and Fate | Books Gateway | Royal Society of Chemistry \(rsc.org\)](#)
[Environmental Science: Nano journal \(rsc.org\)](#)

2. What types of international actions should be taken? *(Multiple answers based on the catalogue of action, Please refer to the [catalogue of international actions](#) prepared by UNEP for more information on available options).*

- Legally binding
 Soft law
 Information sharing and awareness/ Voluntary initiatives
 No international actions are needed
 Other: Provision of authoritative review and consistent global evidence from a new science-policy panel for chemicals, waste and pollution prevention.

- a. Please explain your response, including examples if possible*. _____
3. Which type of approach or measure would you see as appropriate to address this issue at the international level? *(Multiple answers based on the catalogue of action, Please refer to the [catalogue of international actions](#) prepared by UNEP for more information on available options).*
- Regulatory control measures*
 - Information based and enforcement tools (such as Scientific and technical and guidelines, Guidelines and tools for enforcement, Awareness tools (including of consumers))*
 - Options / guidance for economic instruments*
 - Voluntary measures and approaches: (such as Guidelines, principles and strategies)*
 - Measures supporting science-based knowledge and research*
 - Other Provision of authoritative review and consistent global evidence from a new science-policy panel for chemicals, waste and pollution prevention.*
- a. Please explain your response, including examples if possible: _____
4. What factors prevent action/progress on addressing the issue in your country/ organization *(Multiple answers based on list below)?*
- Lack of technical capacity*
 - Lack of scientific knowledge*
 - Difficulties in sharing knowledge and coordinating action among different stakeholders and across sectors*
 - Difficulty with resource mobilisation*
 - Lack of economically feasible green and sustainable alternatives*
 - Only coordinated international action can address the issue (e.g., due to transboundary effects, or prevalence of chemicals in international trade)?*
 - None, there are no factors preventing action or progress*
 - Other: _____*
- a. Please explain your response, including examples if possible: _____
5. Can you point to existing initiatives that could be replicated or scaled up at the international level? *(Open space answer. Please share a weblink to the initiative(s) if available).*

GRACIOUS - Framework for grouping and read-across of nanomaterials/nanoforms for regulatory risk assessment and safe-by-design

Funding: EU H2020 Jan 2018 - Jun 2021 - Euro's 6.9 million total (0.8 million to HWU)

6. Which sectors/value chains need to be closely involved in developing solutions? *(Multi-choice. Please visit the two-page factsheet on [Nanotechnology and Manufactured Nanomaterials](#) for more information on the topic. If you select "Other", please elaborate your response).*
- Agriculture and food production*
 - Construction*
 - Electronics*
 - Energy*

- Health
- Labour
- Pharmaceuticals
- Public, private, blended finance
- Retail
- Textiles
- Transportation
- Waste
- Other: Consumer products

7. Which international forum or instrument would be best placed to take the lead on international action on this issue? (*Open space to elaborate. Please provide specific examples of e.g., intergovernmental bodies, multilateral agreements within or outside the chemicals and waste cluster, international instruments...*).

Beyond SAICM

a. Which international agendas have important linkages with this issue of concern? (*Multiple answers based on list below. For more information, please see the [UNEP assessment paper on linkages with other clusters related to chemicals and waste](#)*):

- Agriculture and Food
- Biodiversity
- Climate Change
- Health
- Human Rights
- Sustainable Consumption and Production
- World of Work
- Other: Pharma, Consumer goods

b. Please explain your response, including examples if possible. (*Open space question. For more information, please see the [UNEP assessment paper on linkages with other clusters related to chemicals and waste](#)*):

8. What priority level do you attach to this issue for international action?

- Very high
- High
- Medium
- Low
- Very low

9. Is there any priority further work you would like to suggest at the national level*? (*Open space to elaborate. Please share a weblink to the suggestion(s) if available*).

10. Is there any priority further work you would like to suggest at the regional level*? (*Open space to elaborate. Please share a weblink to the suggestion(s) if available*).

19. Per- and polyfluoroalkyl substances (PFASs)

Screening Question - Per- and polyfluoroalkyl substances (PFASs)

The PFAS family is composed of thousands of synthetic organic chemicals that contain at least one perfluorocarbon moiety (e.g. –CF₂–) in their molecular structures. These substances have been widely used in numerous commercial and consumer applications since the late 1940s.

Since the late 1990s and early 2000s, studies have been conducted to assess some “long-chain” PFASs. Their findings resulted in the listing of perfluorooctanesulfonic acid (PFOS) and its precursors under the Stockholm Convention in 2009. That same year, at ICCM2, SAICM stakeholders identified “managing PFASs and the transition to safer alternatives” as an issue of concern. A resolution by ICCM2 further invited intergovernmental organisations, governments and other stakeholders “to consider the development, facilitation and promotion in an open, transparent and inclusive manner of national and international stewardship programmes and regulatory approaches to reduce emissions and the content of relevant perfluorinated chemicals of concern in products and to work toward global elimination, where appropriate and technically feasible”

Please visit the two-page factsheet on [Per- and polyfluoroalkyl substances \(PFASs\) and the transition to safer alternatives](#) for more information on the topic.

1. **Entry question:** Would you like to provide responses on this issue of concern? *(Please select only 1 option below. If you select a "No" option, you may move to the Conclusion page)*

- Yes
- No, I do not know enough about this issue
- No, this issue is not relevant to my country or institution
- No, other

- a. If you selected "No, other" in the previous question, please elaborate here:

The PFAS family is composed of thousands of synthetic organic chemicals that contain at least one perfluorocarbon moiety (e.g. –CF₂–) in their molecular structures. These substances have been widely used in numerous commercial and consumer applications since the late 1940s.

Since the late 1990s and early 2000s, studies have been conducted to assess some “long-chain” PFASs. Their findings resulted in the listing of perfluorooctanesulfonic acid (PFOS) and its precursors under the Stockholm Convention in 2009. That same year, at ICCM2, SAICM stakeholders identified “managing PFASs and the transition to safer alternatives” as an issue of concern. A resolution by ICCM2 further invited intergovernmental organisations, governments and other stakeholders “to consider the development, facilitation and promotion in an open, transparent and inclusive manner of national and international stewardship programmes and regulatory approaches to reduce emissions and the content of relevant perfluorinated chemicals of concern in products and to work toward global elimination, where appropriate and technically feasible”

Please visit the two-page factsheet on [Per- and polyfluoroalkyl substances \(PFASs\) and the transition to safer alternatives](#) for more information on the topic.

Please answer the questions below that are relevant to your organization/ country/ region:

1. Do you agree with the assessment report that further international action is necessary*? *(If you select "No", you are welcome to answer the questions below or you may proceed directly to question 9)*

- Yes
 No
 Do not know

a. Please provide a brief explanation for your response*. The RSC has developed policy positions on this theme, as a priority theme in its work programme.

See on the RSC website at [pfas-policy-position-dec-2021.pdf \(rsc.org\)](#) Risk-based Regulation of PFAS

See on the RSC website [rsc-policy-position-on-pfas-in-uk-drinking-water.pdf](#) Position statement on PFAS in UK drinking water.

PFAS play an important role in some vital products that improve quality and longevity of life. With that recognition, concerns are increasing across the world about the adverse health impacts of PFAS, to humans and wildlife. All PFAS are persistent. All uses of PFAS should be assessed, using specific risk-based regulation based on sound science, with better environmental (bio)monitoring and grouping approaches to characterise exposure and hazard, respectively. Investment now in new scientific approaches, and in the skills base for the provision of scientific advice, will enable the health and environmental risks of groups of PFAS to be better understood. Release of toxic PFAS into the environment must be controlled in the near future. We need to know as soon as possible which of the many hundreds of PFAS are toxic and which are not. It is possible to achieve effective PFAS-specific regulation, to retain the safe and sustainable uses of PFAS in products and processes that are

considered vital to future innovations of benefit to society. Aban on all PFAS as a group is neither practical, necessary, nor achievable. However, defined PFAS groups that are shown to present an unacceptable risk to humans or wildlife must be restricted or removed. This policy position provides a thought-starter for discussing a risk-based framework for PFAS regulation, to maintain high standards of health, safety, and environmental protection, and promote effective global action to reduce pollution.

See a collection of papers on PFAS at:

[PFAS Home \(rsc.org\)](#) Themed Issue RSC Publishing

2. What types of international actions should be taken? *(Multiple answers based on the catalogue of action, Please refer to the [catalogue of international actions](#) prepared by UNEP for more information on available options).*

- Legally binding*
- Soft law*
- Information sharing and awareness/ Voluntary initiatives*
- No international actions are needed*
- Other: _____.*

a. Please explain your response, including examples if possible*. _____

Currently, a few PFAS have been restricted at the international level under the Stockholm Convention, but other types of PFAS have been developed to take their place. This process of substitution, coupled with the large number of PFAS (>10,000 according to the OECD definition), means that international action could consider a grouping approach in the future to speed up the regulation of harmful PFAS.

BRS Conventions: Legally binding mechanisms such as the Stockholm Convention should continue to be used to restrict the most harmful PFAS. Other multilateral environmental agreements may also be useful, for example to increase regulation on PFAS-containing wastes.

Voluntary initiatives and soft law should be used to encourage producers and users of PFAS to phase out the use of PFAS in non-essential uses and develop safer alternatives to PFAS for use in other products and processes.

3. Which type of approach or measure would you see as appropriate to address this issue at the international level? *(Multiple answers based on the catalogue of action, Please refer to the [catalogue of international actions](#) prepared by UNEP for more information on available options).*

- Regulatory control measures*
- Information based and enforcement tools (such as Scientific and technical and guidelines, Guidelines and tools for enforcement, Awareness tools (including of consumers))*
- Options / guidance for economic instruments*
- Voluntary measures and approaches: (such as Guidelines, principles and strategies)*
- Measures supporting science-based knowledge and research*
- Other: _____*

- a. Please explain your response, including examples if possible: The problem is so large, complex and diverse and relevant to so many chemicals in products that a toolbox of policy approaches is necessary. Thousands of per- and poly-fluoroalkyl substances have been invented by industry over many decades. These substances are highly persistent and not biodegradable; they exist in the environment for years. Regulatory frameworks have not captured their safety evaluation or mandated safety data to be generated, often due to low tonnages being manufactured or by virtue of some being fluoropolymers. Where there have been local high exposure pollution incidents of PFAS getting into water supplies, adverse human health and animal health events have been seen. There are a wide range of potential serious health effects caused by acute exposure to PFAS pollutants; less is known definitively about background diffuse pollution to PFAS chemicals, but early scientific evidence suggests that with chronic exposures it is possible adverse health effects could occur. More research is needed, and policy action taken to prevent. A potentially risky exposure to PFAS would be from daily exposure in drinking water or food supplies.
4. What factors prevent action/progress on addressing the issue in your country/ organization *(Multiple answers based on list below)*?
- ✓ *Lack of technical capacity*
 - ✓ *Lack of scientific knowledge*
 - ✓ *Difficulties in sharing knowledge and coordinating action among different stakeholders and across sectors*
 - ✓ *Difficulty with resource mobilisation*
 - ✓ *Lack of economically feasible green and sustainable alternatives*
 - ✓ *Only coordinated international action can address the issue (e.g., due to transboundary effects, or prevalence of chemicals in international trade)?*
 - None, there are no factors preventing action or progress*
 - ✓ *Other:Lack of evidence*
- a. Please explain your response, including examples if possible: _____

Measurement and monitoring technologies for PFAS are still in development. More scientific coordination and increased technical capacity is needed to fully understand the profiles of PFAS pollution nationally, regionally and globally. There is also difficulty with coordinating across sectors, as PFAS are used in a wide range of manufacturing contexts and in many consumer products. In addition to industry, coordination is also required with the environmental sector and water companies. The ubiquitousness of PFAS makes controlling the problem difficult, and the mobility of PFAS means that pollution in one country may affect another if there is not coordinated action across geopolitical boundaries. Finally, there is a lack of cost effective and technically effective substitutes to PFAS, and substitutes that do exist often present similar problems of persistence and toxicity. So it is very important to coordinate efforts in order to prevent regrettable substitution.

5. Can you point to existing initiatives that could be replicated or scaled up at the international level? *(Open space answer. Please share a weblink to the initiative(s) if available).*

Manufacturers have sometimes voluntarily agreed to phase out PFAS from some consumer products, for example in food packaging: <https://www.fda.gov/food/cfsan-constituent-updates/fda-announces-voluntary-phase-out-industry-certain-pfas-used-food-packaging>

[rsc-risk-workshop-report.pdf](#)

Workshop report – ‘When the science is uncertain, what is the role of risk-based approaches and precautionary control in chemicals policy?’ RSC Burlington House London June 2022 – More discussions on how to make policy decisions for PFAS when there are large science gaps.

6. Which sectors/value chains need to be closely involved in developing solutions? *(Multi-choice. Please visit the two-page factsheet on [Per- and polyfluoroalkyl substances \(PFASs\)](#) for more information on the topic. If you select "Other", please elaborate your response).*

- ✓ *Agriculture and food production*
- ✓ *Construction*
- ✓ *Electronics*
- ✓ *Energy*
- ✓ *Health*
- ✓ *Labour*
- ✓ *Pharmaceuticals*
- ✓ *Public, private, blended finance*
- ✓ *Retail*
- ✓ *Textiles*
- ✓ *Transportation*
- ✓ *Waste*
- Other: Consumer goods, Water Sector.*

PFAS are used in wide-ranging and specific applications, such as hydraulic fluids, biocides, flame retardants, fire-fighting foam, floor polishes, construction materials, protective clothing, food packaging, heat-resistant non-stick cooking surfaces, medical devices, and insulation of electrical wires, to name a few. As PFAS are used across a range of sectors, broad engagement will be necessary. Sector-bodies could be a useful point of engagement, as they represent many businesses at once. Other sectors including waste management and drinking water sectors will also need to be involved, as they will most directly deal with PFAS in the environment.

7. Which international forum or instrument would be best placed to take the lead on international action on this issue? *(Open space to elaborate. Please provide specific examples of e.g., intergovernmental bodies, multilateral agreements within or outside the chemicals and waste cluster, international instruments...).*

Stockholm Convention – PFAS are persistent pollutants.

- a. Which international agendas have important linkages with this issue of concern? *(Multiple answers based on list below. For more information, please see the [UNEP assessment paper on linkages with other clusters related to chemicals and waste](#)):*

- ✓ *Agriculture and Food*
- ✓ *Biodiversity*
- ✓ *Climate Change*
- ✓ *Health*
- ✓ *Human Rights*
- ✓ *Sustainable Consumption and Production*
- ✓ *World of Work*
- Other: _____*

Please explain your response, including examples if possible. (*Open space question. For more information, please see the [UNEP assessment paper on linkages with other clusters related to chemicals and waste](#)*):

Agriculture and food production: PFAS-containing sewage sludge can be spread on fields as fertiliser, exposing crops to PFAS. Also, fertilisers may contain PFAS, although it is yet unclear if they are intentionally added or have leached from packaging. Similarly, food packaging materials that contain PFAS may pose a risk of contaminating food for human and animal consumption.

Health: Some PFAS are known to be toxic, and research suggests that others may also pose a threat to human health, although there is still much research to be done. Lessening the use of PFAS and preventing PFAS pollution from the environment, food, and drinking water, will be important to preventing the negative effects on health posed by some PFAS.

Sustainable consumption and production: PFAS have been an important component in many products and processes, but they may do more harm than good once they get into the environment. Therefore, PFAS are a prime example of the need to design products with the full lifecycle of the materials in mind. Similarly, consumers may have an opportunity to choose products with alternative materials if PFAS are not essential for the functioning of the product or other alternatives to the product exist (e.g., non-stick pans).

World of work: Worker exposure to PFAS could happen, so it is important to control such sources of exposure in order to protect worker safety.

8. What priority level do you attach to this issue for international action?

- Very high*
- High*
- Medium*
- Low*
- Very low*

9. Is there any priority further work you would like to suggest at the national level*? (*Open space to elaborate. Please share a weblink to the suggestion(s) if available*).

PFAS specific regulation to implement stricter drinking water standards locally, and enforcement of stricter factory emissions into air, land and water. Increased monitoring of PFAS in drinking water and factory effluents.

Generation of national inventories of use of PFAS.

10. Is there any priority further work you would like to suggest at the regional level*? *(Open space to elaborate. Please share a weblink to the suggestion(s) if available).*

Conclusion:

Thank you for having reached this point in the form. You are now on the last page. Below are a final set of questions covering all 19 issues of concern.

GCO-II issues:

[Arsenic](#) | [Cadmium](#) | [Glyphosate](#) | [Lead](#) | [Microplastics](#) | [Neonicotinoids](#) | [Organotins](#) | [Phthalates](#) | [Polycyclic Aromatic Hydrocarbons \(PAHs\)](#) | [Triclosan](#) | [Bisphenol A \(BPA\)](#)

List of SAICM issues:

[Chemicals in products \(CiP\)](#) | [Endocrine-disrupting chemicals \(EDCs\)](#) | [Environmentally Persistent Pharmaceutical Pollutants \(EPPPs\)](#) | [Hazardous substances within the life cycle of electrical and electronic products \(HSLEEP\)](#) | [Highly hazardous pesticides \(HHPs\)](#) | [Lead in paint](#) | [Nanotechnology and manufactured nanomaterials](#) | [Per- and polyfluoroalkyl substances \(PFASs\) and the transition to safer alternatives](#)

Please submit your completed form via email **15/08/2023** COB Central European time (CET).

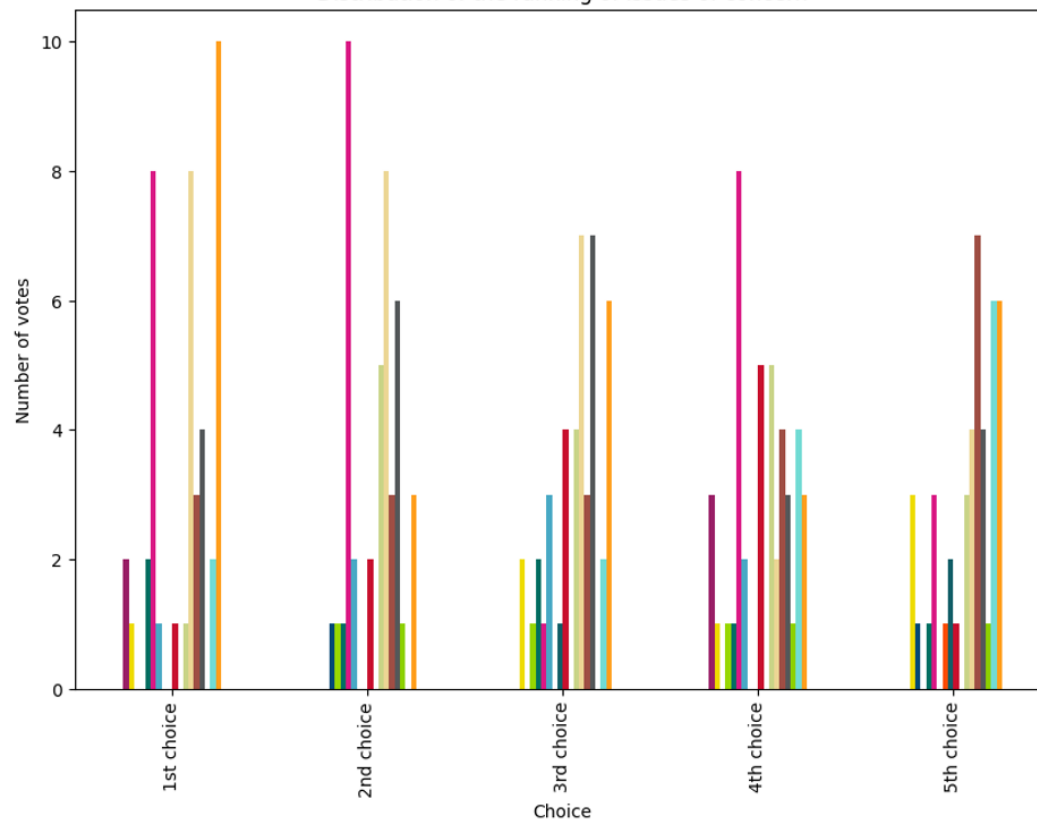
1. From the list of 19 issues, which issue(s) do you think is/are the most urgent? *(Multiple options from the list of 19 issues)*

- Arsenic
 - Bisphenol A (BPA)
 - Cadmium
 - Glyphosate
 - Lead
 - Microplastics
 - Neonicotinoids
 - Organotins
 - Phthalates
 - Polycyclic Aromatic Hydrocarbons (PAHs)
 - Triclosan
 - Chemicals in products (CiP)
 - Endocrine-disrupting chemicals (EDCs)
 - Environmentally Persistent Pharmaceutical Pollutants (EPPPs)
 - Hazardous substances within the life cycle of electrical and electronic products (HSLEEP)
 - Highly hazardous pesticides (HHPs)
 - Lead in paint
 - Nanotechnology and manufactured nanomaterials
 - Per- and polyfluoroalkyl substances (PFASs) and the transition to safer alternatives
- a. Please explain your response. *(Open space to elaborate).*

The RSC surveyed members in the RSC Environmental Policy Group and our RSC Engagement Group on the SPP in July 2023. The responses are shown graphically below.

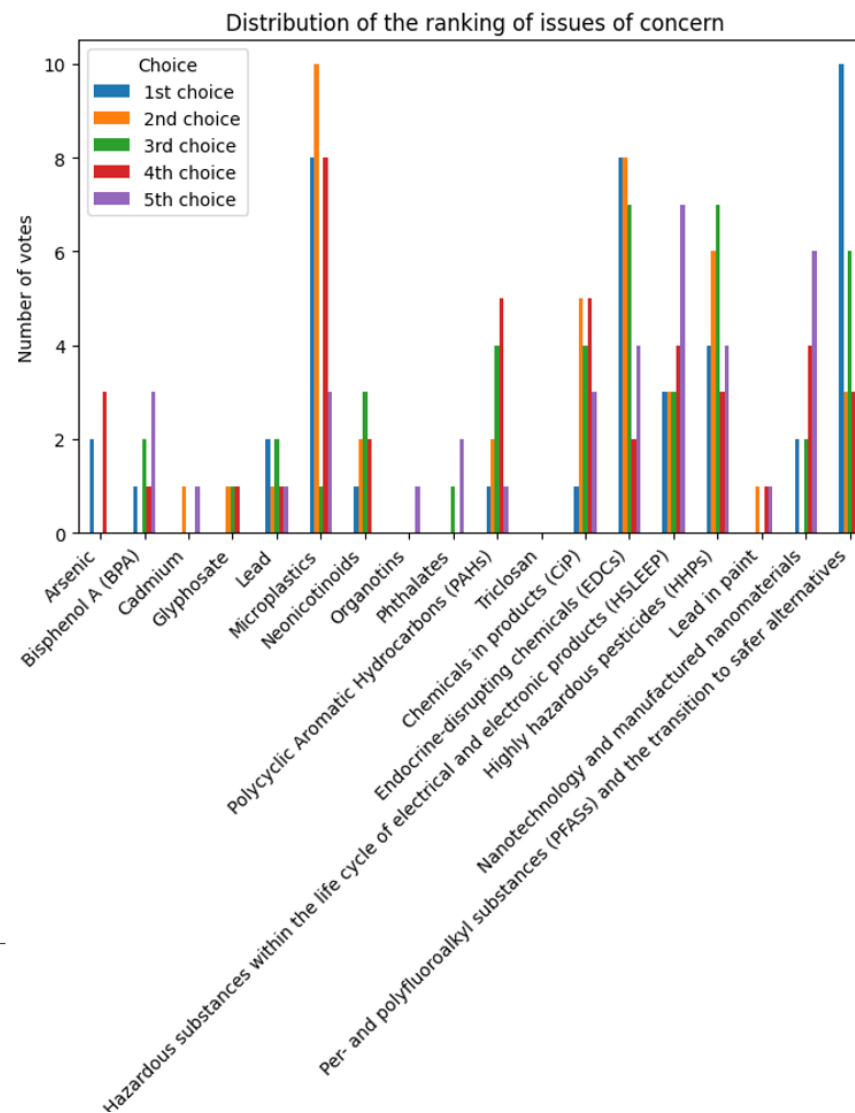
Issues of concern ranked in top 5

Distribution of the ranking of issues of concern

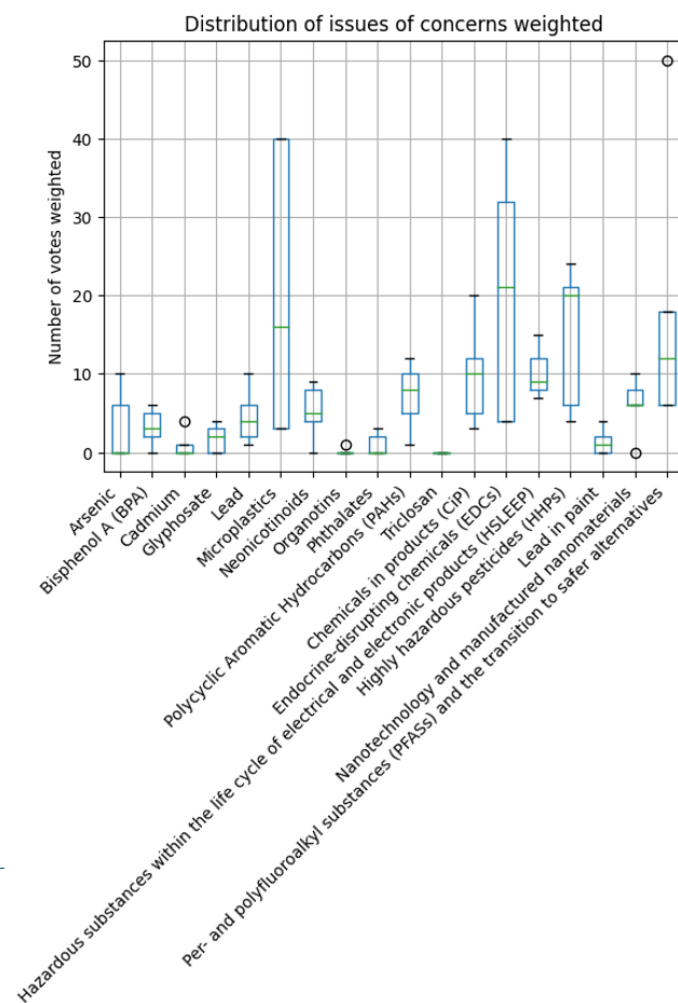
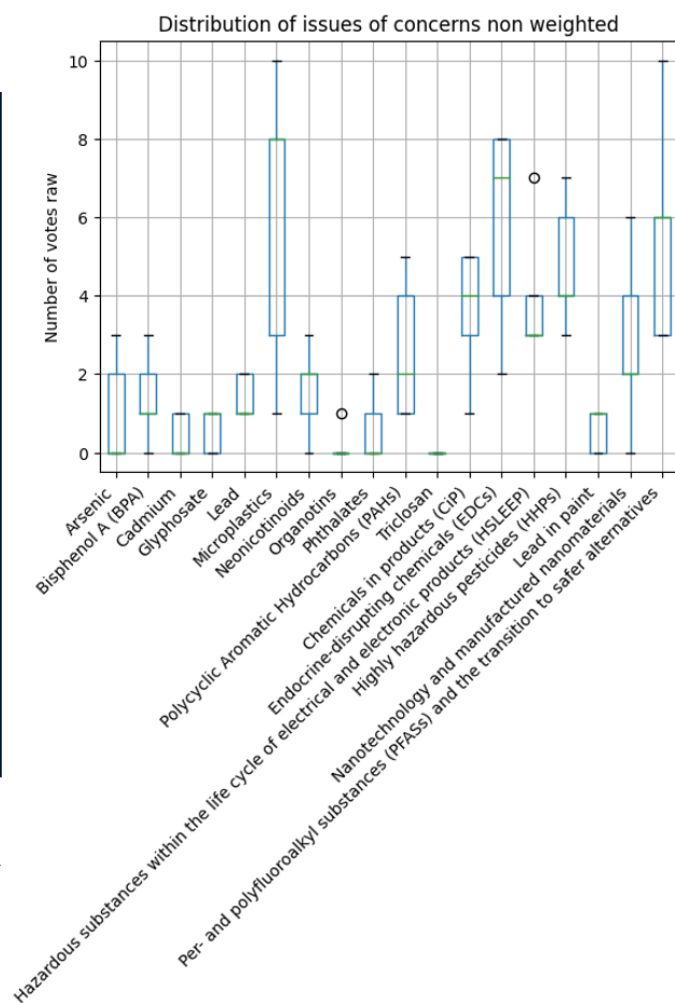


Arsenic	Lead	Phthalates	Endocrine-disrupting chemicals (EDCs)	Lead in paint
Bisphenol A (BPA)	Microplastics	Polycyclic Aromatic Hydrocarbons (PAHs)	Hazardous substances within the life cycle of electrical and electronic products (HSLEEP)	Nanotechnology and manufactured nanomaterials
Cadmium	Neonicotinoids	Triclosan	Highly hazardous pesticides (HHPs)	Per- and polyfluoroalkyl substances (PFASs) and the transition to safer alternatives
Glyphosate	Organotins	Chemicals in products (CiP)		

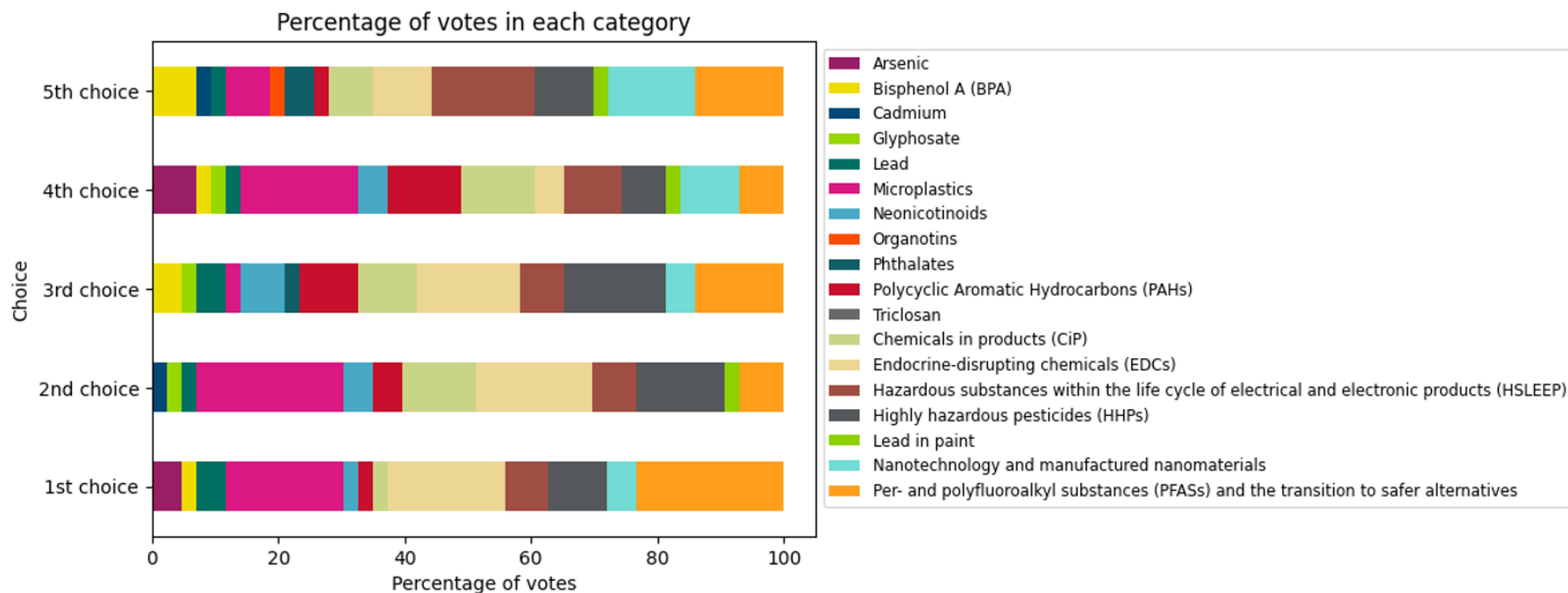
Occurrences of the issues of concern in the top 5 choices



In both boxplots, Microplastics and endocrine-disrupting chemicals are the main concerns. With the weighting we can see that the difference between these two concerns and the rest is even stronger.



Distribution of issues of concerns in each category in percentage



2. From the list of 19 issues, which issue(s) is/are the most actionable? *(Multiple options from the list of 19 issues)*

- Arsenic
- Bisphenol A (BPA)
- Cadmium
- Glyphosate
- Lead
- Microplastics
- Neonicotinoids
- Organotins
- Phthalates
- Polycyclic Aromatic Hydrocarbons (PAHs)
- Triclosan
- Chemicals in products (CiP)
- Endocrine-disrupting chemicals (EDCs)
- Environmentally Persistent Pharmaceutical Pollutants (EPPPs)
- Hazardous substances within the life cycle of electrical and electronic products (HSLEEP)
- Highly hazardous pesticides (HHPs)
- Lead in paint
- Nanotechnology and manufactured nanomaterials
- Per- and polyfluoroalkyl substances (PFASs) and the transition to safer alternatives

b. Please explain your response. *(Open space to elaborate).*

A tick has been placed for issues where there is sufficient and extensive scientific evidence and in principle a technical position could be reached. Those left blank are areas where further research is needed and data gaps can be identified. The work of the science-policy panel could help in principle reviewing existing evidence and reaching globally harmonised conclusions/ways forward on all of these issues, even those which are data poor. Consolidating existing evidence and identifying data/evidence gaps can support policy development for the more challenging areas.

3. Are there any other observations you wish to note? *(Open space to elaborate).*

In order to ensure resources are deployed in the most efficient way and real change is made in reducing levels of harmful global pollution, **a prioritisation framework is needed for the science-policy panel on chemicals, waste and pollution prevention**, looking at the most urgent, risky and impactful issues. A science-policy panel can also potentially bring increased clarity to controversial issues by consolidating multiple lines of evidence and considering the state-of-the-art scientific positions.