UN environment programme

Assessment Report on Issues of Concern

Published September 2020

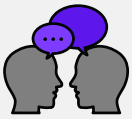
CHEMICALS in PRODUCTS (CiP)

1. Sources

Chemicals are important components in many of the products that modern society uses and relies on. They may be released at any stage of a product's life cycle (including production, use, recycling or reuse, end-of-life disposal), resulting in exposures for humans and the environment and potential adverse effects.

2. Why is it relevant?

The Overarching Policy Strategy of the Strategic Approach to International Chemicals Management (SAICM) includes the objective of "ensuring that information on chemicals throughout their life cycle, including, where appropriate, chemicals in products, is available, accessible, user-friendly, adequate and appropriate to the needs of all stakeholders".



Information exchange in the value chain is fundamental for identifying and soundly managing any chemicals of concern in products.

It is closely linked to the right to know, a basic human right defined by the United Nations.

CiP was identified as an issue of concern under SAICM at the fourth meeting of the International Conference on Chemicals Management (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, electronics and building products.

3. Existing instruments and actions

In 2015, at ICCM4, governments and stakeholders welcomed the CiP Programme, which sets out three information objectives for CiP information exchange related to broader knowledge exchange, disclosure to stakeholders outside the supply chain for better management, and information that is accurate and accessible.

The exchange of important aspects of CiP information throughout the supply chain has been advanced by diverse stakeholder actions. In several sectors, such as for cosmetics, personal care products and food additives, communication of chemicals used in products has long become mandatory through labelling of the full ingredient list in many if not all parts of the world.

However, in other sectors, legal requirements of CiP information exchange have been limited, e.g., through narrower scopes in terms of geographical coverage, chemicals coverage (i.e. defined chemicals of concern) and sector coverage (e.g. electrical and electronic products.

For more detailed information on CiP, please see Chapter 3.1 of the ***Assessment Report on Issues of Concern*** and Part A, Chapter 1 of the ***Annexes to the Assessment Report on Issues of Concern***. Available on the UNEP website.

3. Existing instruments and actions (cont.)

CiP information exchange relies instead primarily on voluntary initiatives by individual industrial sector, or individual companies within the sector, mostly within the supply chains. Either through:

A ***passive approach***, which focuses on providing suppliers with a declarable or restricted substance list for products or manufacturing processes; in some cases a positive list of approved chemicals; or

An ***active approach***, where companies may actively invest in knowing which chemicals are used by their suppliers and set up or join an existing system to collect and manage CiP information. Companies may choose to take either of the approaches, or both.

CiP information exchange is supported and facilitated by specific guidance and tools that have been developed. Many of these focus on supply chains, whereas multiple initiatives specifically target actors outside supply chains. Other activities are building capacity, expanding guidance and tools, and promoting best practices across countries.

4. Challenges and opportunities

The passive approach is the most commonly used but it has its limitations. As the science around chemicals evolves fast, new chemicals of concern may be identified before companies can update their lists, and companies may have a hard time keeping up with changes.

In many sectors, the existing instruments and actions have focused on information exchange within supply chains, but not further transfer of the information to designers, consumers, regulators, waste managers and workers. Lack of data on the chemical content in products hampers assessing and managing chemical exposure through products by these stakeholders, including those who may be considered vulnerable populations (e.g., pregnant women, children and elderly people).

CiP information needs to be relevant, accurate, current, and accessible, which is still often not the case.

The more active approach should be promoted and fostered by building on existing regulatory and voluntary initiatives, including existing legal labelling requirement. This approach has the ability to quickly address rapid changes in market and regulatory requirements with much lower costs for crisis management, increased sales and improved brand reputation, supply chain reliability and quality, and better and more innovative products.

CiP information exchange should be extended to actors outside supply chains. Studies are warranted on the feasibility of existing instruments such e.g., taxes and fiscal policies, and new public-private partnerships.

Effective monitoring and enforcement is a key component to ensure the proper functioning and trust of the whole system of communicating CiP information is. For this, both regulatory and voluntary approaches may be considered, and voluntary approaches may learn from (and build on) existing initiatives.

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Hazardous Substances in the Life Cycle of Electrical and Electronic Products (HSLEEP)

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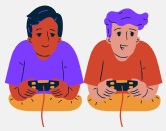
1. Sources

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.

2. Why is it relevant?

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.

In the manufacturing of electrical and electronic products workers may come into direct contact with hazardous chemicals, which can result in significant adverse effects including high cancer rates and negative effects on the reproductive, cardiovascular and immune systems.



Consumers experience exposures in the use phase, typically in indoor environments.

Hazardous substances can be released from electronic waste during disposal and recycling, affecting ecosystems by contaminating the air, water and soil and entering food chains.

Women and children, as well as those living in the vicinity of recycling sites, remain among the most vulnerable groups

Sound management of hazardous substances in EEP, particularly during end-of-life treatment, is challenging. End-of-life electrical and electronic products ("e-waste") constitute the fastest growing waste stream in the world, and their recycling rates remain low in many countries.

In particular, informal and rudimentary recycling methods, as well as uncontrolled disposal, are responsible for large releases of hazardous chemicals in many developing and transition countries, impacting human health and the environment locally.

It would be far more effective to act on the earlier life stages of EEP. Changing design features and other preventative actions would facilitate minimizing the use of certain hazardous substances.

Such a life-cycle approach to addressing hazardous substances in EEP was recognized by the international community, when adopting HSLEEP as an issue of concern under the Strategic Approach to International Chemicals Management (SAICM) at the second meeting of the International Conference on Chemicals Management (ICCM2) in 2009.

For more detailed information on HSLEEP, please see Chapter 3.4 of the ***Assessment Report on Issues of Concern*** and Part A, Chapter 4 of the ***Annexes to the Assessment Report on Issues of Concern***. Available on the UNEP website.

3. Existing instruments and actions

Many instruments and actions have been developed to address HSLEEP at different life-cycle stages and at different levels. In particular, multiple resolutions, declarations and strategic plans have been adopted at the international level, showing high political commitment on the matter.

For example, the Plenipotentiary Conference, the governing body of the International Telecommunications Union (ITU), adopted targets to increase the global e-waste recycling rate to 30% and raise the percentage of countries with e-waste legislation to 50% by 2023.

At the national level, many countries have set up their own laws to restrict certain hazardous substances in EEP or to define roles and responsibilities and targets in managing e-waste, or both. In addition, levies have been used as an instrument to address chemicals in EEP.

These instruments are complemented by voluntary instruments and actions. Some producers have voluntarily phased out or restricted certain hazardous substances in their products, and third-party verification and labelling schemes (e.g. ecolabels) have been set up to address certain hazardous substances in defined product categories.

Many intergovernmental organisations have played an important role in setting up recommendations, guidance and tools, as well as implementing country-level projects, to support countries in sound management of e-waste. Furthermore, different partnerships and programmes have been initiated to address either specific issues or the whole life cycle.

See Annexes for more

4. Challenges and opportunities

Many instruments and actions have focused on e-waste. The current level efforts by countries to restrict certain chemicals in EEP and complementary voluntary restrictions by some manufacturers is likely still not adequate.

The use of some hazardous substances in EEP may be unavoidable because those substances confer unique functionalities, such as the use of tantalum.

With projected increases in digitalisation, global population growth and other factors, the use of EEP will likely grow and thus exacerbate current challenges in handling hazardous substances in EEP and e-waste.

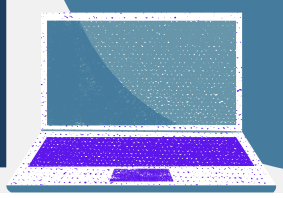
In developing and transition countries, a substantial fraction of e-waste is handled by informal sectors, often with limited awareness of hazardous substances in EEP and minimal protection.

To step up global action to address the early life-cycle stages of EEP, a more proactive approach in all countries to addressing the early life-cycle stages of EEP needs to be considered, including levies.

Product design and associated regulations need to take such cases into account to minimise exposure throughout every step of the EEP life cycle.

Novel action may also be taken to increase the longevity of products.

Efforts are needed to improve understanding of the role and impact of the informal sectors in these countries and thus explore concrete steps to reduce the exposure of informal workers, including through promotion of best practices and extended producer responsibility.



For more detailed information on HSLEEP, please see Chapter 3.4 of the ***Assessment Report on Issues of Concern*** and Part A, Chapter 4 of the ***Annexes to the Assessment Report on Issues of Concern***. Available on the UNEP website.

1. Introduction

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 nanometers.

2. Why is it relevant?

Despite being often composed of known chemicals (e.g. metals or carbon structures), the small size of manufactured nanomaterials and nanoparticles can lead to behaviour different from the "bulk phase." While this "nano-behaviour" enables a multitude of nanotechnology applications, it has also given rise to concerns about potential adverse effects of nanomaterials.

Nanotechnology has rapidly developed in the past few decades and led to the widespread presence of nanomaterials in consumer products and industrial applications.

Consumers may be exposed to nanomaterials via a wide range of products, including food packaging, textiles and personal care products, and workplace exposure to nanoparticles may occur in various types of industries.

Once released to the environment, nanomaterials may undergo many transformations, potentially altering their fate, transport and toxicity.

Most nanomaterials do not undergo biological degradation and can therefore persist in the environment.

The low level of knowledge of their effects on human health and the environment coupled with a rapidly growing market led to the identification of "nanotechnology and manufactured nanomaterials" as an issue of concern under the Strategic Approach to International Chemicals Management (SAICM) at the second meeting of the International Conference on Chemicals Management (ICCM2) in 2009.

3. Existing instruments and actions

The variety and variability of nanomaterials and their behaviours make it difficult to determine a "one-size-fits-all" approach to nanomaterials as a whole.

At the moment, no global-scale regulation is in place. Intergovernmental institutions have worked on developing guidelines, developing guidance for testing and assessments, capacity building, and technical assistance. These are complemented by tools and actions by other stakeholders, for example, clearinghouse mechanisms for information sharing or tools to inform businesses about chemicals likely to be banned or restricted.

For more detailed information on nanomaterials, please see Chapter 3.7 of the ***Assessment Report on Issues of Concern*** and Part A, Chapter 7 of the ***Annexes to the Assessment Report on Issues of Concern***. Available on the UNEP website.

3 Existing instruments and actions (cont.)

At the regional and national scales, different regulatory instruments containing specific provisions for nanomaterials have been and are being developed, building on existing regulations that apply to the substances of which a nanomaterial is composed, e.g., establishing specific reporting and record keeping obligations.

From a non-regulatory perspective, voluntary partnerships between regulators, industry and other stakeholders also have led to various actions. For example, countries and companies cooperating to support the Organisation for Economic Co-operation and Development guidance and testing development for nanomaterials.

See Annexes for more

4. Challenges and opportunities

Perhaps the largest gaps in knowledge necessary for regulation and sustainable management of nanomaterials are production, use and end-of-life of nanomaterials.

Academic and commercial interests remain high in developed countries, which have great capacity to develop and use nanomaterials, but policymakers have yet to follow up on these rapid developments and the fast-growing introduction of these materials markets and waste streams.

Nanomaterials cannot be identified and assessed based on their chemical identity alone. Their physical characteristics strongly affect their behavior. As a result, no uniform definition exists and currently, different regulatory instruments apply different definitions.

Challenges in the analysis of nanomaterials makes it unlikely that regulations could truly be enforced at present.

There exists a need to adapt regulatory data requirements around the world to take into account the properties and life cycles of nanomaterials, and thus inform hazard and risk assessments.

There is an opportunity to work towards a common definition and grouping strategies.

More work is needed to develop new analytical tools or further develop existing ones until robust and routine high-throughput methods are available.

At the international level, enabling a systematic assessment of the risks of manufactured nanomaterials may be considered.

Developing standardized tests, validating and possibly harmonising existing testing methods would help facilitate comparison and reliability of data.

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PER- and POLYFLUOROALKYL SUBSTANCES (PFASs)

1. Sources

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. They are used or applied most often where extremely low surface energy or surface tension and/or durable water and oil repellency is needed (e.g. in various fire-fighting foams and for surface treatment of textiles).

2. Why is it relevant?

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

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

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

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

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

3. Existing instruments and actions

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

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

For more detailed information on PFASs, please see Chapter 3.8 of the ***Assessment Report on Issues of Concern*** and Part A, Chapter 8 of the ***Annexes to the Assessment Report on Issues of Concern***. Available on the UNEP website.

3. Existing instruments and actions (cont.)

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

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

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

4. Challenges and opportunities

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

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

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

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

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

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

Novel regulatory and voluntary approaches need to be developed to assess and manage the many PFASs on the market and their potential fluorinated alternatives as a group or groups.

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

For more detailed information on PFASs, please see Chapter 3.8 of the ***Assessment Report on Issues of Concern*** and Part A, Chapter 8 of the ***Annexes to the Assessment Report on Issues of Concern***. Available on the UNEP website.