Addressing Chemicals of Concern in Electrical and Electronic Equipment

Options for Action for Policymakers

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Feedback and contact The United Nations Environment Programme encourages interested readers of this report to engage and share their views about the report. E-mail: science.chemicals@un.org
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Why are chemicals of concern (CoC) in EEE important?

The global production and consumption of Electrical and Electronic Equipment (EEE) is growing rapidly and EEE has become indispensable in modern societies, enhancing living standards. Currently, the total weight of global EEE consumption (excluding photovoltaic panels) on average increases by 2.5 million metric tons annually (Forti et al. 2020). This increasing consumption and production leads to an increase in raw material extraction and accompanying pollution. Furthermore, e-waste is one of the world's fastest growing waste streams. In 2019, the world generated about 54 million metric tons of e-waste and by 2030, the amount of e-waste is expected to grow to about 75 million tons per year (Forti et al. 2020). Only 17.4% of the e-waste globally generated in 2019 entered formally documented collection and recycling channels.

EEE consist of a large variety of components made of a wide range of materials and contain many chemical additives. Some of these chemicals are hazardous and may be released during production, use, transport and end-of-life treatment (including disposal or recycling, see Figure 1), leading to environmental and human exposures and possible adverse effects (UNEP 2020a). The sound management of hazardous chemicals in EEE is challenging. In particular, informal recycling and disposal at end-of-life stages can lead to significant releases of chemical pollutants, impacting human health and the environment locally. Women and children and communities living in the vicinity of recycling operations can be especially vulnerable to such impacts (UNEP 2019). Further information on CoC in EEE is available in UNEP's Global Chemicals Outlook II (UNEP 2019) and UNEP's assessment report on issues posing risks to human health and the environment (2020a).

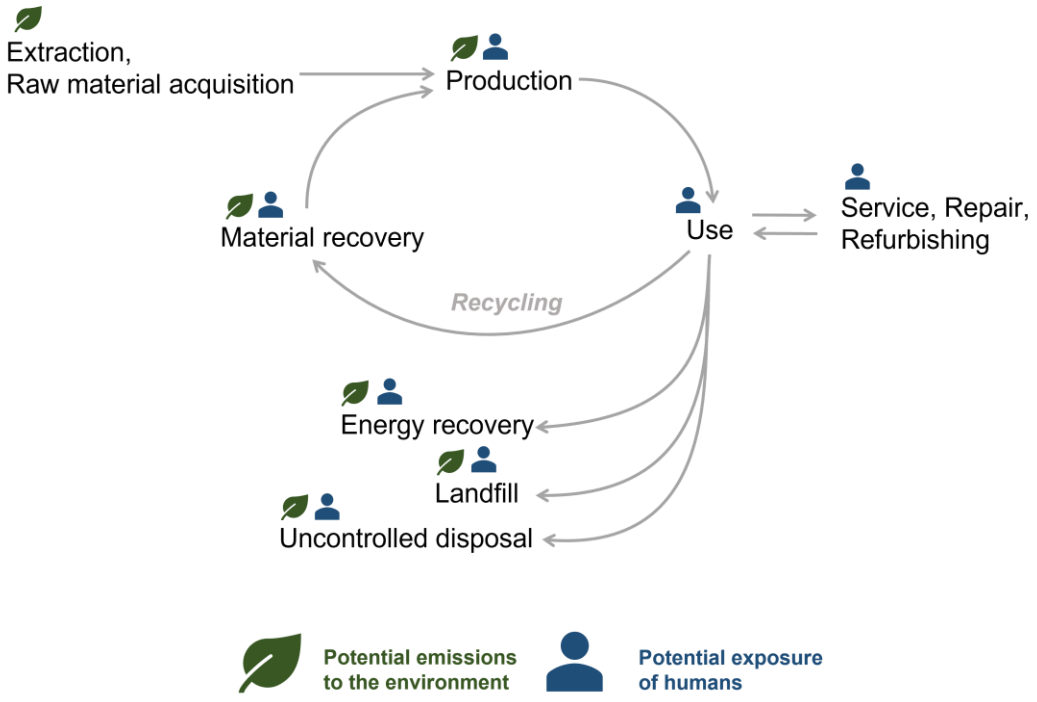

Figure 1: Potential exposure of humans or the environment to chemicals of concern (CoC) along the life cycle of EEE.

Key areas for taking and supporting upstream action

While there are many initiatives and action concerned with the management of e-waste (ITU n.d.; UNEP/IETC n.d.; UNIDO n.d.) , it is critical to also address the issue of chemicals of concern (CoC) in EEE already at earlier life stages of products (e.g. during design or manufacture), in order to minimize potential impacts of chemicals of concern downstream. For policymakers, there are three key areas for taking and supporting such upstream action on chemicals of concern in EEE (Figure 2):

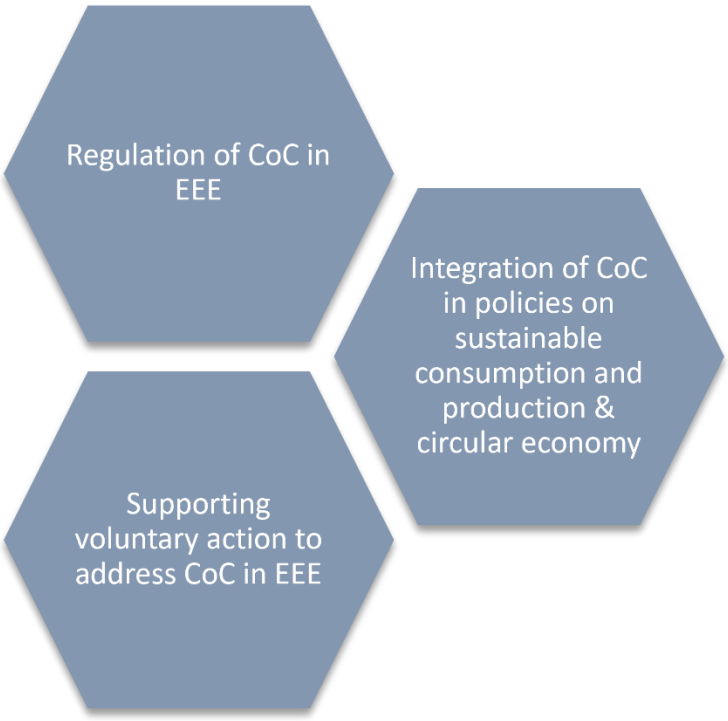

Figure 2: Key areas for taking and supporting upstream action on chemicals of concern (CoC) in EEE.

First, **regulation explicitly addressing CoC in EEE** is an important driver of upstream action on harmful chemical in the sector. By this, regulatory action can help protect human health and the environment from adverse impacts and advancing innovation on safer alternatives for chemicals of concern. A recent overview developed by UNEP has identified regulations addressing the use of chemicals of concern in EEE in 45 countries or territories (UNEP 2020b). The chemical scope of these regulations encompasses a relatively small number of chemicals and chemical groups, including selected heavy metals, brominated flame retardants and phthalates. Also, many countries, both, in the global north as well as in the global south currently do not have regulatory measures in place that address chemicals in EEE. Further action in the regulatory and policy domain is thus needed, in order to advance on the elimination of harmful impacts of chemical pollution at all stages of the life cycle of EEE, including at end of life.

Given the cross-cutting nature of challenges related to chemical pollution, action on CoC in EEE should furthermore be integrated into **policies on sustainable consumption and production** and into actions towards a more circular economy. Eliminating or, when not possible, minimizing the use of harmful chemicals in EEE could, for example, support the sector's shift towards more circular models of material

use by preventing contamination of material cycles and increasing value retention at product end-of-life. Carefully designed sustainable public procurement policies can furthermore generate demand for innovative solutions that minimize or eliminate the use of CoC in EEE.

Lastly, policymakers can take a central role in **supporting voluntary action to address CoC** at upstream value chain stages taken by other stakeholders, including industry or civil society organisations. Such voluntary actions include requiring or recommending use of government or private sector ecolabels for consumer information that include criteria on CoC, support and use of voluntary industry standards and initiatives, and targeted research to reduce or phase-out certain chemicals of concern. By providing enabling conditions, clear incentives, and strategic and technical guidance, policymakers can contribute to scaling up and mainstreaming of initiatives, ensuring coordination and to leveraging synergies across different voluntary initiatives.

Options for action for policymakers

The following sections **propose concrete options for action targeted at upstream stages of the value chain** for consideration by policymakers in order to advance on the issue of chemicals of concern in EEE and support the minimization and elimination of adverse environmental and human health impacts. These options for action span across the three key areas and build on opportunities outlined in the Global Chemicals Outlook II (UNEP 2019) and a recent UNEP Assessment Report on Issues of Concern (UNEP 2020a) as well as on work conducted under a GEF-funded project entitled 'Global best practices on emerging chemical policy issues of concern under SAICM' (GEF ID 9771). While the three key areas outlined in the previous section generally are considered complementary in nature, individual upstream actions can be cross-cutting. There is also the potential for actions in one key area to creating spill-over effects in other key areas. For example, actions taken by policymakers to improve transparency on CoC in EEE along the value chain can strengthen regulatory action, but also support a shift towards improved circularity of material streams or facilitate the development of a voluntary eco-label by a civil-society organization.

The options for action proposed in this document are intended to inspire policymakers and to offer guidance on possible entry points for taking action to address the issue of chemicals of concern in EEE at upstream stages of the value chain. Applicability and prioritization of these options for action depend on national contexts and capacities, both of which warrant careful consideration when evaluating potential courses of action.

Enhancing coordinated and coherent regulation of CoC in EEE

- Establish and strengthen regulatory capacity for risk management action on CoC[1] in EEE, including legal and institutional infrastructure, with sufficient government funding. This entails the development of national strategies and legislation with clear allocation of mandates and responsibility of public bodies and other actors involved. It should furthermore include a

[1] Such as, for example, restrictions, bans, labelling requirements or other regulations aiming at minimizing risks of chemicals to human health or the environment.

mechanism for regular review, revision and update of regulatory risk management action on CoC in EEE in order to account for rapid development in the electronics sector.

- Strengthen regulatory risk management action based on scientific assessments of hazards and risks to human health and the environment from chemicals in EEE throughout the entire life cycle of products.
- Follow a precautionary approach in situations where necessary information on hazards and impacts of chemicals on human health or the environment is incomplete or inadequate.
- Ensure that regulatory action addressing CoC in EEE is coherent across different regulatory domains, including chemicals, products, waste and workplace safety regulation as well as coherent with obligations under multilateral environmental agreements, and establish coordination between national regulatory agencies.
- Strengthen implementation and enforcement of existing regulation on CoC in EEE and develop procedures to extend enforcement to e-commerce operations.
- Explore regional and global collaboration to accelerate, streamline and coordinate action across differing regulatory landscapes.

Strengthen knowledge and closing regulatory data-gaps on chemicals in EEE

- To ensure protection of human health and the environment from potential impacts of CoC in EEE, regulatory authorities and policymakers need to have a clear understanding of which chemicals are used in which EEE. Requirements related to transparency of information on use and applications of chemicals in EEE should thus be strengthened in the regulatory context.
- In collaboration with the scientific community, scale-up the development of science-based assessments of environmental and health hazards and risks of chemicals in EEE. Such assessments should take into account currently prevalent practices and contexts of manufacturing and end-of-life handling, including informal recycling.
- In collaboration with the scientific community and industry stakeholders, develop new risk assessment methods for chemicals of concern in EEE that account for the shift from linear to circular material use models. This can include, for example the consideration of multiple use cycles in risk assessments or assessment of impacts of chemicals of concern on efforts to move towards a more circular economy.
- Mindful of differing institutional capacities, explore cooperation with regulatory authorities, policymakers, academia, industry, and civil society at regional and international level to build on existing knowledge and avoid duplication of efforts.

Increase transparency on chemicals along the entire value chain

- Establish requirements and other incentives for sharing of information about chemicals in EEE along the value chain and develop clear rules and procedures, including data ownership, type and detail of information, and protection of confidential business information.

- Ensure that information on chemical use in EEE reaches practitioners at the product end-of-life, such as recyclers and waste handlers and incentivise technical and digital solutions to do so.
- Ensure that appropriate information on chemical use and potential impacts is provided to consumers and buyers of EEE to facilitate informed purchasing decisions.
- Promote platforms for dialogue and exchange of information amongst value chain stakeholders, such as manufacturers, importers, waste handlers, regulators and civil society representatives.

Align action on CoC in EEE with sustainable consumption and production and circular economy policies

- Ensure that the issue of CoC is addressed in the context of circular economy policies for electronics. This includes identification and assessment of effects of CoC on the circularity of individual material streams and proactive elimination of chemicals-related barriers for circularity.
- Leverage public procurement to include considerations on chemicals of concern into public procurement policies for EEE.
- Promote and provide support for eco-innovation that addresses the use of CoC in EEE, particularly for small- and medium-sized enterprises. This could, for example, include establishing eco-design requirements for EEE that consider CoC or the development of national technical guidance for the substitution and phasing out of CoC in EEE and supporting the development of practical experience and expertise in supporting institutions at national level, such as technical competency centres or National Cleaner Production Centres.

Strengthen innovation and voluntary initiatives for reducing or eliminating the use of CoC and their releases into the environment along the product life cycle

- Provide or ensure funding for research based on green and sustainable chemistry objectives and guiding considerations (UNEP 2020c) for the development of new materials and technologies that reduce or eliminate chemical pollution at all life cycle stages of EEE.
- Establish platforms for dialogue and exchange on innovations for actors of the EEE value chain to facilitate mainstreaming and upscaling of innovations supporting action on chemicals of concern in EEE.
- Provide economic incentives and targeted financial support for scaling up of technologies and business solutions that reduce or eliminate the use of CoC and their releases into the environment along the product life cycle.
- Promote the development and use of eco-labelling initiatives for EEE that consider the issue of CoC within their criteria.

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