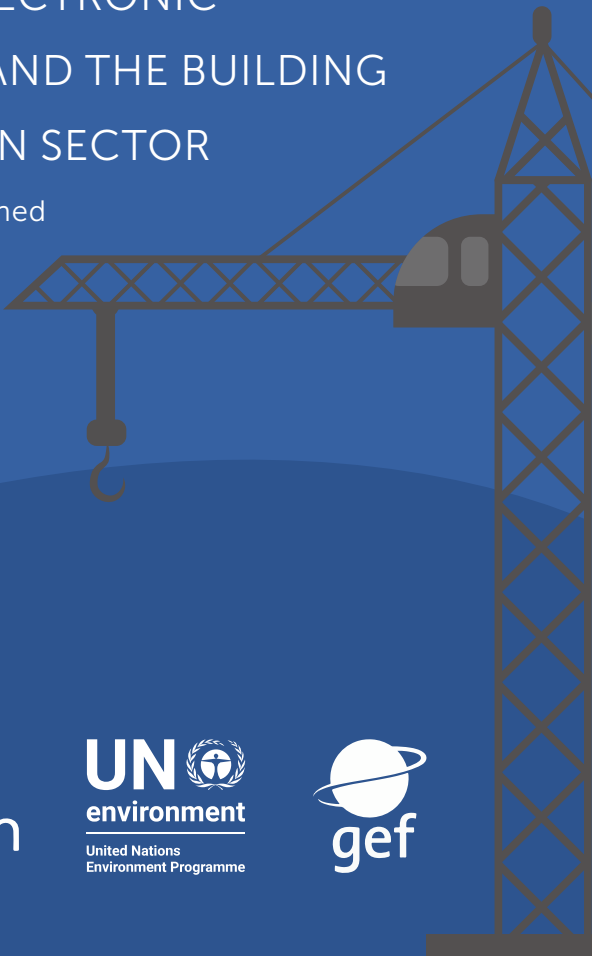
ADDRESSING CHEMICALS OF CONCERN IN

ELECTRICAL AND ELECTRONIC EQUIPMENT, TOYS, AND THE BUILDING AND CONSTRUCTION SECTOR

Key messages and lessons learned



saicm

UN environment
United Nations Environment Programme

gef

Introduction

Chemicals of concern (CoC) in products have been a longstanding emerging policy issue under the Strategic Approach to International Chemicals Management (SAICM). To further advance this issue, a Global Environment Facility (GEF) funded project on Global Best Practices on Emerging Chemical Policy Issues of Concern under SAICM was launched in 2019. The project has developed tools and guidance and identified lessons learned with the aim of increasing the ambition of stakeholders to track, control, and manage chemicals in several sectors guided by the UN Environment Programme's (UNEP) value chain approach. Moving forward, GEF-funded activities that fell under SAICM until the end of 2023 will be hosted by the new Global Framework on Chemicals (GFC).

This document summarises lessons learned from the various project activities in three sectors: electrical and electronic equipment (EEE); building and construction; and toys. It also formulates key messages addressed to different stakeholder groups and provides links to guidance and tools developed under the GEF project, which mainly fall under one of four categories:

Sustainable business

Companies along the entire product value chain play a key role in addressing CoC in products, for example, through product design, material ingredient selection, production processes, or portfolio choices for retail. UNEP's eco-innovation approach helps small and medium-sized enterprises (SMEs) in developing countries, in particular, to develop and diversify sustainable business models that reduce CoC in product portfolios and limit the impacts and use of chemicals along the value chain.

Strengthening regulation

Regulatory requirements are strong drivers for CoC management and for innovation that supports CoC phase out. Reviews of existing policy instruments and targeted recommendations can increase regulatory ambition and help policymakers take action on CoC in products for the protection of human health and the environment.

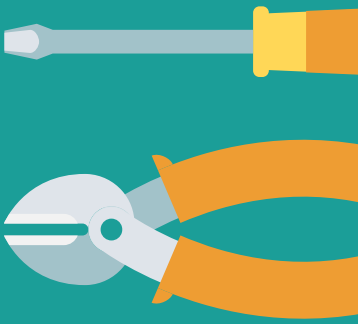
Procurement and finance

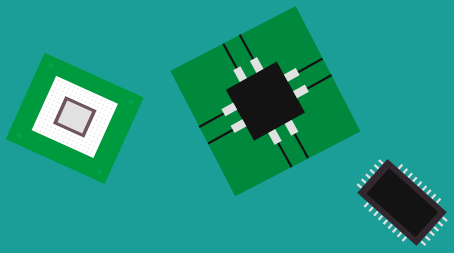
Through sustainable public procurement strategies, government entities can nudge market demand and drive innovation. With targeted financial products, the banking and finance sector can further increase the mobilisation of capital to advance the development and market uptake of solutions for better management and phasing out of CoC in products.

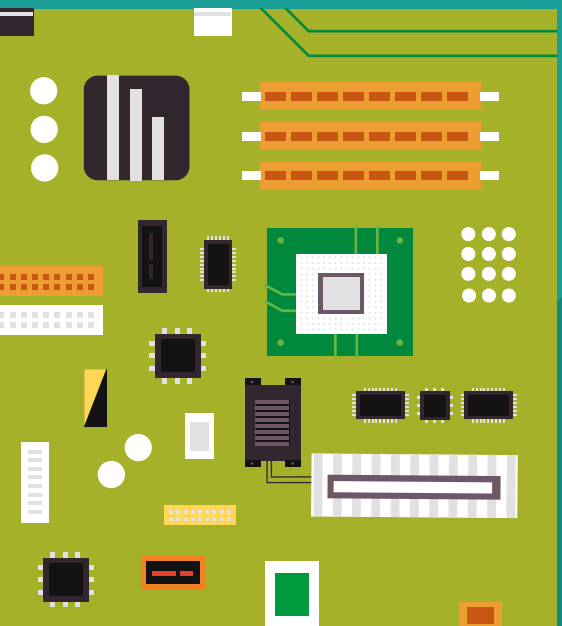
Eco-labels

Traceability and transparency are critical for better managing and phasing out CoC in products. Eco-labels can increase transparency for consumers, and support businesses in measuring, improving, and communicating the sustainability performance of their products with respect to CoC content. For governments, eco-labels can encourage behavioural change of producers and consumers towards long-term sustainability.

ELECTRICAL AND ELECTRONIC EQUIPMENT







Global production and consumption of electrical and electronic equipment (EEE) has increased considerably. The total weight of EEE consumption (excluding photovoltaic panels) has been growing by about 2.5 million metric tons per year, leading to an increase in raw material extraction and associated pollution. Given this surge, e-waste is now one of the world's fastest growing waste streams and is expected to increase to around 75 million tons per year by 2030. However, only 17.4% of e-waste generated globally in 2019 was documented as formally collected and recycled.

CoC used in EEE are hazardous and may be relesed during production, use, transport, and end-of-life treatment, including disposal or recycling, leading to environmental and human exposure and possible adverse impacts caused by lead, mercury, cadmium, and other metals, antistatic and plasticizing agents, flame retardants, and certain phthalates, among others. Informal recycling and disposal at the end-of-life can lead to significant releases of associated chemical pollutants, impacting the local environment and human health. This illustrates the importance of addressing CoC in EEE during the early production stages, such as design or manufacturing, to minimise potential impacts downstream.

1. *Develop safe and sustainable alternatives for CoC through material and product innovations without creating negative trade-offs*

Alternatives may provide the desired function through chemical substitution of CoC, or non-chemical approaches, such as achieving the desired function through redesign of products, or substitution of materials. However, they should not result in adverse impacts or compromise other development objectives, such as mitigating climate change. Public procurement can play a role in stimulating this shift to safer chemicals and more sustainable practices along the EEE value chain by driving innovation.

Project Guidance

The publication, Sustainable Procurement of Electronics: A Progressive Approach to Chemicals of Concern, provides guidance and recommendations for addressing CoC in the context of sustainable public procurement in the electronics sector. It establishes technical requirements on EEE and services and defines clear and simple procurement criteria that address "hot spots" of a product across its lifecycle.

2. *Harmonise policy and regulatory frameworks across countries and regions*

Regulations addressing CoC in EEE can support the transition to more sustainable products and circular business models in the sector, as well as minimise the impacts of e-waste. Policymakers, especially in countries with insufficient or non-existent legislation, can adopt and build on existing regulations and obligations, such as the EU Directive on the Restriction of Hazardous Substances in EEE (RoHS), which can help close regulatory data gaps. Such regulations should encompass the range of CoC and cover all stages of the lifecycle, while aligning or integrating with sustainable consumption and production and circular economy policies. In addition, setting regulations that explicitly addresses CoC in EEE can advance innovation on safer alternatives.

Project Guidance

The publication, Chemicals of Concern in Electronics: Review of Legislative and Regulatory Approaches, focuses on approaches that prohibit CoC use in electronics, including the transposition of RoHS.

The brief, Addressing CoC in EEE – Options for Action for Policymakers, proposes options targeted at upstream stages of the value chain to address CoC in EEE, offering guidance on possible entry points for taking action to address the issue.

Regional studies for Latin America and the Caribbean (LAC) and Central and Eastern Europe on lifecycle management of electronics assess the status of the EEE sector in the respective regions and provide recommendations and a roadmap towards a more circular EEE value chain.

3. *Ensure access to information regarding CoC in EEE and related risks*

Information on CoC in EEE and related risks must be conveyed to all stakeholders, including consumers, empowering them to make safe and sustainable purchasing decisions. Eco-labelling initiatives can provide information on CoC throughout a product's life cycle, as well as bolster alignment among the various existing ecolabeling schemes. Brands and retailers can use ecolabels and similar certification schemes to enhance transparency and traceability along the entire value chain, while consumer associations and NGOs can work with and pressure brands to adopt eco-labelling.

Project Guidance

The report, Addressing the Issue of CoC in Electronics: Challenges and Recommendations for Labelling Initiatives, explores how ecolabels address CoC and provides recommendations for further harmonisation and integration. It also discusses how ecolabels for EEE may incentivise the reduction and/or improve management of CoC.

4. *Minimise chemical releases and pollution from CoC throughout the lifecycle*

Strategies to minimise releases at all stages by all relevant stakeholders can safeguard the environment and protect human health. Brands and component manufacturers can contribute by rethinking business practices and implementing eco-innovation principles. Strengthening innovation and voluntary initiatives for reducing or eliminating the use of CoC and their releases into the environment along the product life cycle is important.

Project Guidance

The Electronics Supplement of the Eco-innovation Manual is a comprehensive guide to help companies in the EEE sector improve the sustainability of their practices and manage eco-innovation opportunities.

5. *Identify and involve local stakeholders*

Identifying all local stakeholders, including consumers, manufacturers, labour organisations, and waste treatment facilities and involving them in the development and implementation of measures and initiatives to address CoC is essential. In addition, policymakers play a central role in supporting voluntary action taken by other stakeholders to address CoC at upstream value chain stages, including industry or civil society organisations.

Project Guidance

The Regional Electronics Study and Circularity Roadmap in the LAC Region: Mapping of Stakeholders identifies actors involved in different lifecycle stages of EEE, specific motivations, and interests in pursuing a circular economy. Mapping, thus far, has been undertaken for Argentina, Brazil, Colombia, Mexico, and Uruguay.

While lessons learned across these five areas are considered complementary, individual actions can be cross-cutting, with the potential for actions in one area to create spillover 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, while facilitating the development of a voluntary eco-label by a civil society organisation.

BUILDINGS AND CONSTRUCTION

Buildings are a key component in the fabric of modern cities. With rapidly increasing urbanisation all over the globe, the built environment is only expected to expand. At the same time, building and construction is one of the most chemical-intensive sectors, representing the largest end market for chemicals and generating the highest chemical revenue. The global construction sector is expected to increase by 3.5% annually with its chemicals market estimated to grow by 6.2% per year between 2018 and 2023. Chemical products used in the building and construction sector include commodity chemicals, such as plastic resins (e.g., PVC), and specialty chemicals, such as paints, coatings, adhesives, sealants, advanced polymers, and additives.

Compared to other products containing chemicals, the lifetime of building components can span several decades or even centuries. This results in a gap between the design and manufacturing phases and the end-of-life stages of construction projects, during which there is an accumulation of knowledge concerning chemicals, their associated risks, and their potential effects on both health and the environment. At the same time, the lengthy lifespan of buildings increases the risk of information on materials used being lost between construction and refurbishment or demolition.Therefore, addressing the issue of legacy chemicals is also important.

1. *Increase information and transparency and ensure access to information on CoC along the entire lifetime of building products*

Information regarding CoC in building products and their associated risks for human health and the environment must be transparent and available to all stakeholders, including owners and residents, across the value chain and the entire life cycle of buildings.

Upstream material suppliers, the entry point to the value chain, need to provide information on the chemicals used and their concentrations in materials through means that carry information throughout a building's lifetime (several decades), such as (digital) material passports. At the end of a building's life, demolition operators and recyclers could use such passports to identify and properly separate construction and demolition waste, including waste that contains harmful chemicals.

Actions to ensure information flows can build on, and should be compatible with, existing initiatives, such as certifications schemes (e.g., LEED) and databases providing safety information (e.g., GISBAU initiative).

Project Guidance

The 2021 SAICM report on Chemicals of Concern in the Building and Construction Sector provides an overview of challenges abuilding and construction products. It also identifies specific CoC in various building products, outlines their relevance throughout the life cycle of buildings, and proposes alternatives when possible.

2. *Accelerate the uptake of green building products and practices through financing instruments*

While green buildings and products (including those low in CoC) typically have higher costs than conventional buildings and products, evidence is growing that benefits to health and the environment, as well as tangible cost savings over time, outweigh higher upfront investments. At the same time, evidence shows that only modest cost premiums are required to design and build in a green and sustainable manner.

To address higher upfront costs, financial institutions could provide financing products with favourable terms for green and sustainable construction projects. These could include concessional interest rates and higher debt-to-equity ratios in order to balance higher capital expenditures compared to conventional buildings.

Project Guidance

Guidance on Sustainable Building Finance to support green mortgage development in Sri Lanka outlines barriers to green property development, financial benefits, relevant finance instruments, and recommendations on developing green property finance products.

3. *Keep policy and regulatory frameworks up-to-date and harmonise them across countries and regions*

A well-informed and harmonised regulatory framework across geographies has the potential to accelerate the phasing out of CoC in buildings, as well as innovations to develop less harmful alternatives. Considering the global building and construction supply chains, policymakers would need to ensure that regulations are coherent across countries and regions. Such regulations should be updated with emerging scientific knowledge on applications, potential occurrences of identified CoC, and impacts on human health and the environment resulting from their use. Policymakers can use multilateral frameworks, such as the recent Global Framework on Chemicals, to identify, discuss, and seek common action on emerging issues. At the same time, regulations should avoid unintended consequences on chemical or material choices that could cause adverse impacts.

Resources

The Buildings and Climate Change Adaptation: A Call for Action report provides guidance to governments on how to include adaptation efforts in the sector in their national plans and how to link climate adaptation and mitigation strategies and actions, throughout the life cycle of buildings. The report Global Alliance for Building and Construction's (GlobalABC) was published by the "adaptation" subgroup of the Alliance's Work Area 2 on public policies. The subgroup, which focuses on the need to adapt the built environment to climate change, also proposed 10 Principles for Effective Action to integrate climate change adaptation actions into the building sector and to track annual progress.

4. *Improve the understanding of CoC and their impacts on human health and the environment, and develop safer alternatives*

A comprehensive evaluation of chemicals-related impacts of building materials along their entire life cycle – from processing through use and end-of-life – is a critical first step to identifying potentially harmful chemicals and products to ensure the development and adoption of safer alternatives. Any alternative must avoid negative impacts and align with broader development goals, including climate change mitigation and pollution reduction. All stakeholders involved in the sector, including architects, engineers, and contractors, should work together to identify products with potentially harmful chemicals and to replace them with less harmful ones either through chemical substitution or through non-chemical approaches, such as the redesign of products or materials substitution. Academia and research organisations can also lend their support by performing comprehensive life cycle assessment analyses and identifying or developing alternatives following Green and Sustainable Chemistry Objectives, which material suppliers can then adopt. Industry associations can strengthen such collaborations among stakeholders by establishing collaboration platforms and fora.

Project Guidance

The Building Materials Supplement of the Eco-innovation Manual provides sector specific information and guidance to service providers that can help companies improve the sustainability of their practices and manage eco-innovation opportunities. It includes guidance on developing chemical inventories, conducting chemical assessments, and exploring alternatives. The eco-innovation approach also helps SMEs in developing countries elaborate and diversify sustainable business models that reduce (chemical) impacts of product portfolios and along the value chain.identifies specific CoC in various building products, outlines their relevance throughout the life cycle of buildings, and proposes alternatives when possible.

The Buildings InfoHub provides information and resources for designers, architects, builders, and other actors in the construction value chain to help understand, identify, and reduce the risks and impacts of chemicals in building materials.

The database output of the USEtox model, produced by the UNEP-hosted Life Cycle Initiative, helps building material suppliers and procurers evaluate the impacts of chemical use. This open and freely accessible tool provides a sound scientific basis for comparing the environmental performance of any activity or product associated with chemical emissions over the entire life cycle. The USEtox interface for building materials assesses the human and ecotoxicological impacts of chemicals in building materials while informing on risk reduction efforts and the need to select safer alternatives.

The publication Life cycle based alternatives assessment (LCAA) for chemical substitution proposes an alternative chemical assessement exposure and life cycle impact performance in the substitution process. It addresses gaps in existing frameworks, such as failing to consider trade-offs from human and ecosystem exposures, and impacts associated with chemical supply chains and product life cycles.

TOYS

Toys are an important sector of consumer products, with a total revenue of more than USD 107 billion in 2022 alone. Toy supply chain spans across the globe, producing and assembling toy parts that are composed of different materials, such as plastics, textiles, metals, and wood. Many of these materials consist of, or contain, manufactured chemicals, such as polymers, pigments, or plasticizers. Most of these chemicals are intentionally added, but some can also be present as unintended contaminants.

While these chemicals often provide toys with unique functions, such as elasticity, odour, or colour, the very same properties can often make them hazardous to human health and/or the environment. As children are more vulnerable to health risks due to their rapid metabolic rate, high surface-area-to-body-weight ratio, and rapid growth of organs and tissues, the use of hazardous chemicals in toys is particularly concerning.

1. *Ensure comprehensive and transparent information flow along the value chain and throughout the lifetime of toy products*

To effectively address chemical-related risks, transparent communication is paramount. Every stage of a toy's life cycle, from design to disposal, involves decisions influenced by information on chemicals. By ensuring a transparent and consistent flow of information along the value chain, stakeholders can make informed choices that prioritise the safety and well-being of children. This not only helps mitigate potential risks but also fosters trust among consumers and stakeholders, reinforcing the industry's commitment to safety and responsibility.

While information should mainly flow downstream, all stakeholders can help improve transparency.

Toy manufacturers can request more information about chemicals used in raw materials from suppliers, as well as exert more diligence in the upstream portion of their value chain. Providing such information would overcome many barriers, for example, by saving considerable resources invested in testing and characterisation of materials and components. At the same time, as material suppliers are often unaware about the way the materials are being used, toy manufacturers must communicate chemical-related requirements for toys to their material suppliers.

2. *Develop ambitious policies that are aligned across countries and ensure proper enforcement*

Given that the toy supply chain is global, disparate regulations can lead to confusion, inconsistencies, and potential oversights in ensuring the safety of toys. Developing ambitious policies and aligning them across countries can help establish unified standards that simplify compliance and elevate safety benchmarks. Once established, rigorous enforcement is crucial to ensure the standards are actively integrated into every step of the toy production and distribution process.

Since international standards are often the entry point for countries establishing chemical-related toy safety policies, standardisation organisations with standards relevant for the toy sector should ensure that they are aligned, comparable, and compatible with each other and that they facilitate – rather than hamper – the establishment of stricter requirements whenever new scientific knowledge becomes available.

Project Guidance

A Review of Chemicals-related Toy Safety Policies and Regulations in Selected Low- and Middle-income Countries provides analysis of toy safety policies targeting CoC in toy products in selected countries that import toys from China.

A Summary on Chemicals in Toys Policy in China describes laws and regulations, as well as standards, that are applicable in manufacturing toy products in China.

3. *Strengthen collaboration among value chain organisations*

The toys value chain encompasses a multitude of processes and organisations. Given this complexity, the potential for unintended chemical risks can arise at multiple junctures. To effectively navigate and mitigate these challenges, enhanced collaboration among value chain stakeholders is essential. By fostering a collaborative culture, stakeholders can collectively address potential hazards, share best practices, and ensure that safety standards are consistently upheld. Such efforts also have the potential to fortify the industry's reputation for diligence and responsibility.

Toy industry associations can help increase collaboration and learning among stakeholders by organising events and establishing collaboration platforms for their members. At the same time, toy manufacturers can improve collaboration by establishing long-term contracts and building good relationships with upstream and downstream partners.

4. *Increase training, education, and information sharing on chemical-related issues for all stakeholders*

In the dynamic landscape of chemicals and materials, staying informed about chemical-related issues is critical. Employees, especially those working in chemical assessment or procurement, play a pivotal role in ensuring the safety of products, including toys. Regular training, education, and newsletters by industry associations and companies on chemical-related issues, such as regulations and standards, empower them to make informed decisions. Intergovernmental organisations and local governments can also help build capacity for professionals in developing countries and smaller companies that might otherwise lack the necessary resources and capacity.

While several resources are already available, such as toolkits and online training modules, they must be properly disseminated and be relevant to local realities.

Project Guidance

The Chemicals in Toys – Corporate Training Booklet provides a brief introduction to chemical-related regulations and standards concerning toys, highlights the importance of knowing which chemicals are being used in toy products, and suggests further resources.

5. *Strengthen chemical assessment in companies to avoid unintended use of CoC*

As materials and chemicals used in the production of toys are continually increasing, toy manufacturers must rigorously assess their material supply to prevent the unintended use of CoC. Establishing comprehensive chemical inventories, regularly reviewing and updating them, and ensuring adherence to both global and local regulations and standards are foundational steps in this process. By proactively managing their chemical inputs, manufacturers can also foster trust with consumers and other stakeholders. A robust chemical assessment framework not only mitigates risks but also positions a company as a responsible and diligent player in the market.

Project Guidance

The International Chemicals Management Toolkit for the Toy Supply Chain was developed to support companies in the toy sector with tracking and managing chemicals in their products, fulfilling their chemical-related legal obligations, and substituting CoC with safer alternatives.

A USEtox module for screening chemical toxicity in toy products helps companies gain a better understanding of the impact of their material and chemical choices.


saicm


UN
environment
United Nations
Environment Programme


gef

SAICM Secretariat

United Nations Environment
Chemin des Anémones 11-13
CH-1219 Chatelaine, Geneva
Switzerland

Email: saicm.chemicals@un.org