



## **PHTHALATES AND BISPHENOLS IN MALAYSIA**

### *Executive Summary*

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#### **Short summary**

The Consumers' Association of Penang (CAP) is a grassroots non-profit, civil society organisation based in Malaysia, established in 1970 to promote critical awareness and action among consumers in order to uphold their rights and interests. CAP is dedicated to helping people become more responsible consumers and to protecting them from abuse and malpractices in the market place by exposing unethical business behaviour such as hazards in products and food and pharmaceuticals. We focus on encouraging sustainable and ethical consumption and challenge lifestyles and practices that are unsustainable, unethical, inequitable and environmentally destructive.

The issue on phthalates and bisphenols was undertaken by CAP in 1998 when we first embarked on a campaign on Endocrine Disrupting Chemicals (EDCs). Output of the campaign included a booklet on EDCs and its effects on humans and animals. Over the years, through collaboration with the International Pollutants Elimination Network (IPEN) and IPEN participating organisations CAP was able to test products such as toys, baby feeding bottles, water bottles, erasers, thermal papers, cosmetics and personal care products for the amount of phthalates and bisphenols present. These findings were used for policy advocacy and awareness raising. Malaysia has formulated and implemented regulations to curb the use of phthalates and bisphenols in certain products, but enforcement and compliance are ongoing challenges.

#### **Research methodology**

For this report, we have mostly undertaken secondary research methodologies. It involved literature reviews of existing publicly available data on phthalates and bisphenols such as academic articles, as well as government reports, regulations, synopsis of market studies and other online resources. Our review focused on government reports, peer-reviewed journals, our past research on these chemicals, and joint research projects with IPEN and IPEN participating organisations such as the Wonjin Institute for Occupational and Environmental Health (WIOEH) in South Korea.

#### **Production and use of plastics in the country**

The plastics industry in Malaysia is a key manufacturing sector that supports domestic needs and export markets. The plastics industry is a source of parts and components for Malaysia's downstream manufacturing sectors such as electrical and electronics, automotive, and food packaging. Malaysia has a large and growing plastic recycling [industry](#), driven by its significant plastic manufacturing sector and a [surge](#) in imported plastic waste following China's ban from January 2018.

From January to November 2018, Malaysia was the number one destination for plastic waste, receiving 15.7% of the total plastic exports from the top exporting countries. The United States of

America, followed by Japan and the United Kingdom were the top [exporters](#) of plastic waste to Malaysia in 2018.

In 2023, Malaysia's plastics manufacturing industry [recorded](#) a turnover of USD13.1 billion, of which USD3.4 billion was for direct export. The four largest market [segments](#) served by this industry are packaging (45%), electrical and electronics (28%), automotive (12%), and construction (6%). Malaysia [produces](#) a wide range of plastic packaging products, ranging from rigid (e.g., bottles, containers, etc.) to flexible (e.g., plastic bags, shrink wrap, etc.) for both commercial and industrial use.

In [2023](#), Malaysia's imports of plastics and related products reached USD8.479 billion. China was a major source, with Malaysia importing USD2.189 billion worth of plastics from China, accounting for 25.81% of the total imports for the year. In the same year, Malaysia's exports of plastics and related products amounted to USD9.032 billion. China, Singapore, and Indonesia were the main export markets, with exports to China reaching USD2.168 billion, representing about 24% of the total.

Established [producers](#) of plastic resins in Malaysia include LOTTE Chemical Titan, PETRONAS Chemicals Group (PCG), Kaneka, and Toray. These companies focus largely on commodity plastics (around 4 million tonnes per annum) such as polypropylene and polyethylene, as well as certain niche products within engineering plastics such as acrylonitrile butadiene styrene (ABS) and high-performance plastics such as polyphenylene sulfide (PPS).

The Malaysian Plastic Manufacturers Association (MPMA) reported that overall, Malaysia's plastics industry performed well in 2024. Malaysia's [plastics industry](#) experienced a 5.4% increase in sales turnover, from RM61.4 billion in 2023 to RM64.8 billion in 2024, and an 8% rise in exports, reaching RM17.34 billion, supported by demand from electronics, automotive, and packaging sectors. Among the key challenges impacting the industry are cheap plastic imports from China, anticipated increase in operating costs and global uncertainty.

Sustainability [challenges](#) cited by the MPMA comprise of regulations and enforcement measures by the Malaysian government which includes possible bans of single-use plastics; restrictions and bans on importation of plastic scraps for the recycling sector, e.g., the EU Waste Shipments Regulation; uncertainties surrounding Global Plastic Treaty negotiation, e.g., plastic production cut, phase out and elimination of chemicals of concern and problematic and unnecessary plastic products, compliance to standards, etc.; the upcoming Extended Producer Responsibility (EPR) law and the Plastic Act.

### **Phthalates and bisphenols production and trade in Malaysia**

It was not possible to obtain data for the amount of phthalates and bisphenols produced, imported and exported in Malaysia as the figures available from the *Malaysia Plastics Market Report*, has to be purchased at a high price. One market [report](#) states that the market size for phthalates and bisphenol A in Malaysia for 2024 was USD23.5 billion and it is forecasted to increase to USD35.2 billion in 2033. The trade data is available in UN Comtrade Database but has to be purchased for the specific chemicals.

Di(2-ethylhexyl) phthalate (DEHP) dominates the market due to its widespread use in the production of flexible PVC products such as cables, flooring, and medical devices. Diisononyl phthalate (DINP) is largely used for automotive parts and flooring whilst diisodecyl phthalate (DIDP) is used in the manufacturing of synthetic leather and. Di-n-butyl phthalate (DBP) is often found in products like adhesives and coatings. The other phthalates [reported](#) to be seen in Malaysian

market include di(2-propylheptyl) phthalate (DPHP), di-isobutyl phthalate (DIUP, and ditridecyl phthalate (DTDP).

## **Regulatory controls on phthalates and bisphenols in Malaysia**

Malaysia has implemented regulations to curb the use of phthalates and bisphenols in certain products, but enforcement and ensuring compliance are ongoing challenges.

### Toys

Malaysia amended its consumer protection law on toys which came into effect in 2018, to incorporate 13 international safety standards. The Consumer Protection (Safety Standards for Toys) (Amendment) [Regulations 2016](#) lists ISO 8124-6 Safety of toys – Part 6: Certain phthalate esters in toys and children’s product to be complied with. The [ISO 8124-6](#) specifies the method for the determination of specific phthalates (DIBP, DBP, BBP, DEHP, DNOP, DINP, and DIDP) in various materials in toys and children's products.

All toys in the Malaysian market will need to be tested for the presence of selected chemicals including phthalate and heavy metals, especially involving oral contact toys. Along with this, a Mark of Conformity (MC) for toys labeling scheme was introduced through the Consumer Protection (Certificate of Conformance and Conformity Mark of Safety Standards) [Regulations 2010](#) and subsequent [amendments](#), which requires all plastic toys to be affixed with an MC mark, manufacturer name, address, and name of distributor to indicate that the purchased toys conformed to prescribed safety standards. However, we face inadequate enforcement. Despite these regulations, there is a lack of awareness among consumers, and [findings](#) by researchers of non-compliant toys in the market indicate the need for more stringent monitoring and enforcement.

### Cosmetics

Phthalates have been a concern in cosmetic products globally. In Malaysia, the [Guidelines](#) for Control of Cosmetic Products, which content is adapted from the ASEAN Cosmetic Directive (ACD), prohibits several phthalates. There are three phthalates, diisobutyl phthalate (DBP), benzyl butyl phthalate (BBP), and diethylhexyl phthalate (DEHP) which are [prohibited](#) for use in cosmetic products in ASEAN. Other phthalates listed in Annex II (list of substances which must not form part of the composition of cosmetic products) of the ACD are bis(2-ethylhexyl) phthalate, bis(2-methoxyethyl) phthalate, n-pentyl-isopentylphthalate, di-n-pentyl phthalate, diisopentylphthalate, dihexyl phthalate, and dicyclohexyl phthalate.

The National Pharmaceutical Regulatory Agency ([NPRA](#)) regulates cosmetic products under the Control of Drugs and Cosmetic [Regulations 1984](#). Diethyl phthalate (DEP) and dimethyl phthalate (DMP) that are most commonly used in cosmetic products like fragrances and nail polish are [permitted](#) in Malaysia as per the Asean Cosmetic Directive.

### Excipients in human medicinal products

In accordance with the *Guidelines on the use of phthalates as excipients in human medicinal products* issued by the European Medicines Agency on 20 November 2014, the National Pharmaceutical Regulatory Bureau decided on maximum limit of daily exposures. The [Drug Registration Guidance Document issued](#) by the Director of Pharmaceutical Services, Ministry of Health Malaysia imposes maximum limit of daily exposure (mg/kg body weight/day) of 0.01

mg/kg/day dibutyl phthalate (DBP), 4 mg/kg/day diethyl phthalate (DEP) and 2 mg/kg/day polyvinyl acetate phthalate (PVAP).

### Food packaging

Section 27 of the [Food Regulations 1985](#) prohibits use of harmful packages, stating that “no person shall import, manufacture, advertise for sale or sell, or use or cause or permit to be used in the preparation, packaging, storage, delivery or exposure of food for sale, any package, appliance, container or vessel which yields or could yield to its contents, any toxic, injurious or tainting substance.” While the regulations prohibit harmful packaging, there is no specific mention of phthalates. Hence, concerns remain about phthalates entering the food chain by leaching into food from plastics used in packaging.

### Prohibition of BPA in polycarbonate feeding bottles

[Section 27A](#) of the Food Regulations 1985 states that “No person shall import, manufacture or advertise for sale or sell any feeding bottles containing Bisphenol A (BPA). The words —BPA free may be labelled on the feeding bottles or on the packages of the feeding bottles which do not contain Bisphenol A (BPA).” This prohibition came into force in March 2012.

### Prohibition of BPA in cosmetics

[Annex II](#) of the Asean Cosmetics Directive, which Malaysia is aligned with, lists Bisphenol A (4,4'-Isopropylidenediphenol) as substance which must not form part of the composition of cosmetic products.

## **Transparency and traceability of chemicals in plastics**

Malaysia does not have regulations for chemical transparency and traceability in plastics. From engagement with government agencies, we found that Malaysia is considering developing a National Priority Chemical List. The Department of Environment (DoE) has established Malaysia Environmentally Hazardous Substances ([MyEHS](#)) System. However as of now phthalates and bisphenols are not in the list of chemicals registered.

The objectives of the MyEHS system are to ensure importers and manufactures notify the manufacturing and importation of EHS; to provide the necessary information on EHS; and to manage EHS in a safe and sound manner to protect human health and the environment. Based on the information submitted by industry, the DoE will establish the Malaysian EHS Reference List, which contains information about the identity of substances that have been notified to DoE, their uses in Malaysia, their hazard classification and the accumulated amounts placed on the market in Malaysia. The information in this system will be available to the public.

## **Studies on phthalates and bisphenols in Malaysia**

There are several studies on phthalates and bisphenols in Malaysia, which will be elaborated in the full report. The studies include [analysis](#) of inexpensive toys for levels of DHEP, DEP, DiBP and DBP; [analysis](#) to detect BPA in polycarbonate bottles conducted by CAP with IPEN; [study](#) to test presence of BPA and BPS in thermal paper and phthalates in erasers conducted by CAP with WIOEH; [analysis](#) of recycled High-Density Polyethylene plastic pellets for BPA conducted by CAP with IPEN; a [study](#) found bisphenols in canned foods, dairy products, canned drinks, fruits, and vegetables; [study](#) on presence of BBP and DEHP in loom bands; [investigation](#) of BPA in colloidal and soluble phases in river water; [investigation](#) on effects of storage conditions on release of BPA from polycarbonate and PET bottled water; [study](#) on BPA levels among workers in a plastic

molding factory; and [review](#) of literature for impact of BPA exposure from dental materials on human health.

### **Specific groups of people and places in Malaysia with higher exposure to phthalates and bisphenols**

Infants and children are particularly vulnerable due to exposure from consumer products designed for them. A [study](#) conducted by IPEN with CAP in Malaysia have found BPA in polycarbonate baby feeding bottles and water bottles including those labeled "BPA-free". Phthalates were [found](#) to exceed EU limits in children's toys, posing potential developmental risks through ingestion of contaminated dust or direct contact.

A [study](#) on workers in a plastic injection molding factory found higher urinary BPA concentrations compared to the general population due to exposure in the work area. Exposure to certain phthalates, such as diethyl phthalate (DEP), has been associated with the use of cosmetics and personal care products like perfumes. The National Poison Centre has [stated](#) that prolonged exposure has been linked to fertility issues, liver and kidney damage, and negative effects on fetal development. Sensitive individuals may also experience allergic reactions such as skin rashes, breathing difficulties, and migraines.

A [study](#) on EDCs in the spatial distribution and mean concentrations of EDCs in the Klang Valley region revealed that Hulu Langat, Petaling Jaya, and Putrajaya exhibited higher levels of bisphenol A (BPA). The increasing presence of [EDCs in tap water](#) is a cause for concern as these substances can have adverse health consequences. Exposure to phthalates and bisphenols in Malaysia is particularly high in highly urbanized and industrialized regions, specifically in the state of Selangor and industrial areas in Johor such as [Pasir Gudang](#).

### **National endeavors to phase out bisphenols and phthalates**

Civil society organization such as CAP have been advocating for phase-out of phthalates and bisphenols, and these are supported by the results of analysis of content of these chemicals in certain products. These findings were shared with the relevant authorities and public awareness was raised through media and social media platforms, including [articles](#) on CAP [website](#) and a special issue on plastics in CAP [newsletter](#) Utusan Konsumer.

### **Project ideas to support national regulation of phthalates and bisphenols**

As many of the Malaysian samples were found to contain toxic chemicals, there is an urgent need to call on the government to come out with comprehensive regulatory measures and public protection from harmful plastic additives such as phthalates and bisphenols through raising public awareness of health risks, mobilising public and professional support; advocating for bans on phthalates and bisphenols in consumer products. To support national regulation of phthalates and bisphenols, we need to combine scientific evidence and public health framing to push for binding laws that restrict use in consumer products, including highlighting child health risks.

In Malaysia, we need to advocate and make sure that all bisphenols and phthalates, and their chemical derivatives are banned as a group to avoid regrettable substitutions of one toxic chemical with another. Industry substitution loopholes are anticipated hence we need to be prepared. Investing in safer alternatives will ensure that segments of the population most susceptible to vulnerable situations, including children, women, and disadvantaged communities are protected from toxic exposure to these chemicals.