

Creating a Toxic Free World: avoiding a collision between the EU and the Circular Economy

The European Union (EU) is maintaining a political double standard within circular economy policies. On the one hand, the EU promotes the concept of circular economy and presents itself as a world leader on resource-efficiency. However, on the other hand, the EU has assumed a counterproductive role on product and toxics policy, shuffling to ban well-known toxics such as decaBDEs at the production stage and advocating for the continued recycling of products containing the same hazardous substances through EU policy level and the international Stockholm Convention. By calling for exemptions to allow ongoing recycling of hazardous materials, the EU jeopardises the development of a truly clean and toxic free circular economy. In the pursuit of increasing 'recycling' statistics¹ at any cost, these recycling exemptions would unfairly shift the pollution burden to countries in the global south, where waste from the EU is sent without transparency of final treatment method.

The case of decaBDE illustrates the incoherence between these two important pillars within the Circular Economy strategy: all our efforts to implement a resource-efficient system to maximise recycling can be undermined by weak product policies that allow the recycling of toxic products within the system. As much as reuse and recycling are key components of a zero waste and circular economy future, these systems need to be clean and toxic-free to maximise the quality of material recovery, preserve the environment and people's health and maintain and even increase the public's confidence in both recycling and circular economy systems.

This briefing provides a critical overview on the situation surrounding the toxic chemical decaBDE and puts forward recommendations for the EU's engagement at the next Stockholm Convention in Geneva from 24 April to 05 May 2017, where international negotiations on decaBDE are expected to be finalised. It also proposes a way forward within the EU Circular Economy strategy that will make it possible to close the material loop in the field of recycling of the products that today are contaminated.

The case of decaBDE: a toxic chemical evading regulations

Regulations to ensure strict production and use of the toxic chemical decabromodiphenyl ether, known by its commercial name of c-decaBDE, have been lacking ambition both at the EU and international level.

At the EU level, the recently approved EU regulations for decaBDE in the context of REACH² have established a regulatory system with critical exemptions which undermine the effectiveness of the policies. Moreover, at the international level, the EU has actively undermined its commitment to the Stockholm Convention when advocating for decaBDE to be exempt from further regulations. In both policy arenas, the EU's position is being driven by economic interest of commercial companies without a strong scientific basis, jeopardising the full development and implementation of a clean-toxic free Circular Economy.

What is decaBDE?

DecaBDE belongs to a group of brominated substances (PBDEs³), which are intentionally produced and used as an additive flame retardant to prevent accidental fires. Globally up to about 90% of decaBDE ends up in plastics, primarily in electronics, while the remainder ends up in coated textiles, upholstered furniture and mattresses. The concentration of decaBDE varies, depending on product type, and is in a range of 2.7% to as much as 30%⁴. The lower concentration has been measured in car materials, and the highest in electrical insulation. However, all studies note that specific information is scarce and fragmented.

The available evidence concludes that decaBDE is likely to lead to significant adverse human health effects. Toxicity studies highlight the potential adverse impacts to reproductive system as well as in developmental and neurotoxic system of humans⁵. The warning is that decaBDE seems to be dibrominated in human body, which means it is transformed into more persistent chemical formulas, and its degradation products may also act as endocrine disruptors and affect thyroid hormone homeostasis. Children exposed to decaBDE are likely to be prone to subtle but measurable developmental problems⁶. When incinerated, decaBDE leads to the formation of brominated dioxins and furans which are similar to the better-known chlorinated dioxins, and extremely toxic⁷.

Recently new research has found that top predators such as polar bears have POPs (including PBDEs such as decaBDE) in concentrations of more 100 times the acceptable threshold of risk for humans in adult bears, and more than 1000 times the acceptable risk threshold for cubs⁸. Whilst the effects of this remain to be seen, there is no doubt that at such a high level, the presence of the substance in the body can cause damage to the endocrine system.

Alarmingly, recent studies have found that recycling products with these flame retardants contaminates new products made of recycled plastic. A study of children's toys made of recycled plastics purchased in six EU countries found that 43% of samples contained octaBDE and/or decaBDE⁹.

Furthermore, the effectiveness of such substances to prevent fire has been questioned by many stakeholders, including the industry. In September 2016, the European

Furnitures Industry Confederation (EFIC), along with other stakeholders (including Zero Waste Europe and the European Fire Fighters Union Alliance) released a policy paper asking to ban flame retardants in furnitures due to their toxic effect on human health and their technical ineffectiveness¹⁰.

In conclusion, evidence shows that products containing decaBDE or similar toxic chemical poses a hazard to public health and should be progressively phased out and replaced with safe and effective alternatives¹¹.

Loopholes and shortcomings: decaBDE in the EU

While the production and use of other types of PBDEs such as tetraBDE and pentaBDE have been banned in Europe by Directive 2003/11/EC since 2004, the regulation of decaBDE has followed a much slower and more evasive path and regulations at EU level have been characterised by a clear lack of ambition.

In 2016, the European Commission finalised the regulatory process for decaBDE which is now included in annex XVII of the REACH chemicals regime and restricts the manufacture and sale of the chemical.

However, the framework includes important exemptions. The most critical aspect of the new regulation is that a long deferral period has been granted to recycled materials due to uncertainties about the capacity of the recycling sector to ensure the management of waste containing decaBDE.

This exemption appears to be in direct contradiction with the conclusions from the Committee for Socio-Economic Analysis of the European Chemicals Agency (SEAC), which in September 2015 agreed with tightening the regulation of decaBDE in plastics and textiles. At the time, SEAC pointed that the recycling of materials containing decaBDE should not be exempt of such restrictions. Particularly, SEAC expressed that such exemptions *"could lead to a lower emission reduction of decaBDE"* and that *"a derogation of the recycling of materials would complicate the enforcement of the proposed restriction."*¹²

In 2017, the European Commission is going to conduct a study on hazards posed by decaBDE even though it has already adopted above-mentioned restrictions under REACH. The study will look into all waste streams consisting of, containing or contaminated with the substance and the quantity of these waste streams. It will analyse the technical and economic feasibility of possible waste management options. The study will intend to identify key issues to enable an environmentally sound management of these wastes (including traceability, identification, separation from non-POP wastes, and destruction of decaBDE in these waste streams) and recommend a low POP content level for the substance.

Other shortcomings from the current policy include an exemption to aircraft or spare parts for aircraft produced before 2027 to give the industry "sufficient time to adapt", according to the final text. Also, none of the restrictions will apply to spare parts used in motor vehicles, including agricultural and forestry machinery, produced before 2019. However, information delivered by Boeing confirms that there are commercially available alternatives and decaBDE can be completely phased out by 2018. In fact, it has been suggested that the phase-out of decaBDE in new aircrafts by 2018 is widely supported, that substitution of c-decaBDE is possible and that phase-out of c-decaBDE is ongoing in both the automotive and aerospace industries¹³.

Moreover, the rules extend to its use as a constituent of other substances, in mixtures, or in articles, but only when decaBDE's concentration is equal to or greater than 0.1% by weight, which has been considered unsafe from a health point of view¹⁴. To put this figure in perspective, limit standards for PCBs under Directive 2003/11/EC are 50 ppm (0,005%). Since the neurotoxic effects of decaBDE and the rest of the brominated substances (PBDEs) are similar to those observed for PCBs, the flexibility in these restrictions are not justified and limit standards for decaBDE should be at least as stringent as they are for PCBs.

Other European regulations have failed to set proper limits to the use of decaBDE, such as the WEEE Directive 2012/19/EU on waste electrical and electronic equipment, which requires selective treatment and proper disposal of plastics containing brominated flame retardants but without setting any specific measures and limits (Article 8(2) and Annex VII).

European Union on a collision course with the Stockholm Convention

Not only the EU is preventing strong regulations on decaBDE at the EU level, but it's also preventing strong action at the global level, with significant consequences to developing countries. Unfortunately, it's not the first time that the EU has advocated for lowering the standards on recycling of toxic flame-retardants within the Stockholm Convention. Already in 2009, the EU pushed for an exemption in the listing of pentaBDE and octaBDE and allowed recycling of materials that contain these toxic chemicals until 2030. At COP6 in 2013, the EU tried pushing for a recycling exemption for the flame retardant HBCD but governments rejected the proposal and it was withdrawn.

In the specific case of decaBDE, in 2015, the European Union submitted at COP7 of the Stockholm Convention a proposal that leaves decaBDE in circulation globally in products and in the environment, and undermines efforts to replace it with safer alternatives. The regulations to restrict the use of this chemical under the Stockholm convention are currently being reviewed by the Persistent Organic Pollutants Review Committee and a final decision is scheduled to be made at the next Conference of the Parties in Geneva from 24 April to 05 May 2017. Despite that decaBDE fully fulfils a POP criteria, the EU has advocated to exclude it from the list of POPs regulated by the Stockholm Convention, which is inconsistent with the aims of the convention and undermines efforts to replace such chemicals with safer alternatives.

Moreover, the EU proposed setting the concentration level - so called low POP content limit - for decaBDE at 0.1% (1000 ppm). This amount is 20 times higher than what the EU proposed in 2006 to the Basel Convention, when there was less evidence of decaBDE's toxicity. At the time the EU stated "*As a consequence of the analysis, the application of the methodology developed and the discussions with experts and Member States of the European Union, the following recommendations for low POP content limits result. [...] Other POPs 50 mg/kg*"¹⁵ (50 ppm). Such safer low POP content has been used as yet by the Convention for all intentionally produced chemicals.

The proposed 20 times higher concentration level for the chemical has raised serious concern among non-EU Parties, who are already being used as, or may become dumping

grounds for contaminated waste being delivered under the guise of recycling¹⁶. This concern is justified considering that 80% of electronic waste from the Global North ends for recycling in the Global South, according to estimations by the International Labour Office¹⁷.

Upcoming negotiations about decaBDE in products sent for recycling at the global level should take into account that information about the composition of materials is often lost during transport and distribution, and that no commercially viable technology exists to separate toxic chemicals from those which are recyclable. In conclusion, an exemption to recycling products with decaBDE is an unacceptable hazard for health and the environment. Therefore the substance should be completely phased out in the production of products made with new plastic and recycled plastic.

Recommendations

In a view of the above concerns as well as in the context of circular economy being currently developed in Europe, Zero Waste Europe and its global network GAIA¹⁸ calls for the European Commission to:

- **Withdraw the proposed exemptions for decaBDE in recycled plastics**
- **Withdraw the proposed exemptions for decaBDE in car and aerospace industries.**
- **Set the low POP limit for decaBDE at 50 ppm as it is for other POPs.**
- **Support efforts for complete elimination of this and other toxic chemicals, and the implementation of their safer alternatives.**

More generally, Zero Waste Europe calls on the European Commission to ensure consistency between its progressive speech on a clean Circular Economy and policy actions within global negotiations on toxics. EU cannot pretend to be a frontrunner of the transition towards Circular Economy without showing the way by setting high ambitions at the global level to phase out toxics from the material loop and without taking its full responsibility regarding the social and environmental impact of European waste sent abroad.

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The Stockholm Convention on Persistent Organic Pollutants (POPs)

The Stockholm Convention on Persistent Organic Pollutants (POPs) is an international treaty which aims to protect health and the environment from chemicals which are persistent, bioaccumulative and toxic. The treaty, which was signed in 2001 and entered into force in 2004, regulates the production, export and use of toxic chemicals, mostly pesticides, industrial chemicals and by-products of chemical and combustion processes.

Initially, the Convention entered into force covering twelve POPs chemicals – the so-called “dirty dozen” including: stockpiled pesticides, polychlorinated biphenyls (PCB) and polychlorinated dibenzo-p-dioxins (PCDD), polychlorinated dibenzofurans (PCDF). All of these chemicals are by-products of waste incineration, and other industrial combustion and chemical processes like metal smelting, or chlorine bleaching in pulp and paper mills. However, over the years the Convention has added more chemicals on its list, up to a total number of 26 chemicals (see Appendix 1).

The EU is a signatory party to this Convention and therefore it is required to take measures to eliminate or reduce the release of POPs into the environment (Article 3). Waste containing POPs has to be safely and irreversibly destroyed, and is not permitted to be subjected to disposal operations that may lead to recovery, recycling, reclamation, direct reuse or alternative uses of POPs (Article 6). Moreover, export and import of POPs can only occur when a POP substance is to be disposed in an environmentally sound manner (Article 3.2) under all the international rules, standards and guidelines (Article 6.1) and monitoring mechanisms regulated under Secretariat of the Convention.

The Convention requires countries to develop a National Implementation Plan (NIP) to identify and quantify sources of POPs, and to demonstrate how they intend to implement obligations assumed under the Convention (Article 7). Parties are also committed to provide information and conduct awareness raising and educational activities on the hazards caused by the POPs (Article 10), as well as to facilitate research and undertake the

Appendix

Annexes to the Stockholm Convention on Persistent Organic Pollutants

Annex A

Intentionally produced substances which are prohibited and should be completely withdrawn from production marketing and use

Pesticides: aldrin, chlordane, chlordecone, dieldrin, endrin, heptachlor, mirex, toxaphene, alpha hexachlorocyclohexane (α -HCH), beta hexachlorocyclohexane (β -HCH), hexachlorobenzene (HCB), chlordecone, lindane, pentachlorobenzene (PeCB), pentachlorophenol and its salts and esters (PCP)^(e), technical endosulfan and its related isomers^(e);

Industrial chemicals: hexabromobiphenyl (HBB), hexabromocyclododecane (HBCD)^(e), hexabromodiphenyl ether and heptabromodiphenyl ether (hexaBDE and heptaBDE)^(e), hexachlorobutadiene, pentachlorobenzene (PeCB), polychlorinated biphenyls (PCB)^(e), tetrabromodiphenyl ether and pentabromodiphenyl ether (tetraBDE and pentaBDE)^(e);

By-products: alpha hexachlorocyclohexane (α -HCH), beta hexachlorocyclohexane (β -HCH);

Annex B

Intentionally produced substances which production, use as well as the import and export is restricted for specific purposes

Industrial chemicals: DDT, perfluorooctane sulfonic acid, its salts (PFOS) and perfluorooctane sulfonyl fluoride (POSF)^(e),

Annex C

Unintentionally produced pollutants which formation should be prevented through application of best available techniques and best environmental practices, including waste reduction, use of less hazardous chemicals, and change of waste treatment processes

By-products: hexachlorobenzene (HCB), pentachlorobenzene (PeCB), polychlorinated biphenyls (PCB), polychlorinated dibenzo-p-dioxins (PCDD), polychlorinated dibenzofurans (PCDF), polychlorinated naphthalenes (PCN).

(e) Specific exemptions in Annexes A and B for which Parties may register in accordance with Articles 3 and 4 of the Convention.

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