

NonHazCity 2 (#X006)
Hazardous Substances - knowledge and behaviour change!
Start of the “Plastic diet” month!!

14-15 April 2021, virtually in Pärnu, Estonia

Report

Rapporteur: Kai Klein, BEF Estonia
Attachments: Agenda, presentations

14 April 2021 Knowledge

Plastic as vector for hazardous substances

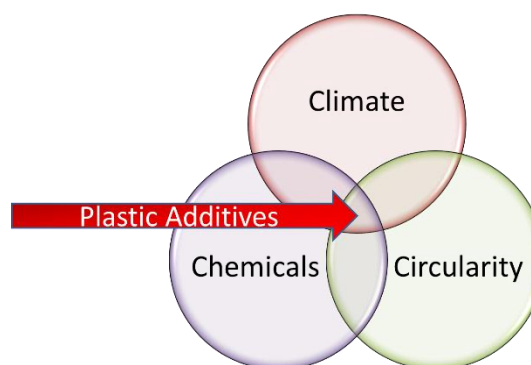
Plastic has become a part of our society because it is convenient, cheap and because for long time we have ignored the trade-offs. Important part of plastic is the additives used to achieve the wished properties and these additives are key challenge on how we will deal with circularity and how our society will come circular one.

Plastic additives are threat to our health and unfortunately, they are not enough visible.

Plastic additives are used to give to the article certain properties – flexibility, colour etc. The downside of the additive use is that they may leak either intentionally or unintentionally from the article. Relatively big share of the additives used are toxic to our health and our environment thus though their pollution is invisible their consequences will at one stage come unfortunately visible.

Plastic pollution as such is visible (birds with plastic inside the stomach etc) and emotionally more relatable by humans but pollution caused by plastic additives is still unfortunately invisible. Although the concern regarding the additives which often have endocrine disrupting properties should be our main focus point.

If the mother mammal consumes substances which have endocrine disrupting properties, then this can affect her health, it can also affect the health of the child and what is even more problematic also the health of the child’s children. Plastic can harm or kill the animals now but the plastic additives with endocrine disrupting properties can harm the future generations.



Unfortunately, there is a lack of proof – as we can relatively easily prove that an animal was killed by plastic then health effects caused by plastic additives is much-much harder.

Food contact material is one area we can take action and understand the contamination. Good example is the chilli oil – as known in chemistry like extracts or stores like. When wanting to get the chilli flavour out of the chilly then it is reasonable to sink it in the oil and as a result the chilli flavour ends up in the oil. Oils tend to move into oils and acids into acids. That’s the chemistry behind chili oil. Bisphenol A is chemically similar to chilli oil – it is thousand times more soluble in oil than in water. If oily food comes into contact with plastic with added BPA, it is possible that some of that BPA will migrate to the food, which then gets consumed.



It is unfortunately still hard to quantify in our daily lives and as long we do not have full certainty and proof it is important also to state that. Thus, there is no solid certain proof yet that we suffer harm to the third generation when we are exposed to EDCs, and that oily food will pull harmful additives out of food contact material but there is a suggestion for how to act.

Years ago, when we there was still a lot of societal debate about human induced global warming, someone said to “So, we don’t know this for certain. Imagine you are driving in the fog, you don’t know for certain what is on the road ahead, but you slow down anyway”. In this kind of cases, it is important to use the precautionary principle – as driving in the fog we do not accelerate but break.

The invisible issue will become more visible as long there is action based on the existing knowledge and willingness to understand the interlinkages.

Health aspects - Should we be afraid of a rubber duck?

Rubber duck is symbol of toxic substances which are hidden threat to our health. Progress has been a big step for humanity and in the same time it is has been also big step for lifestyle diseases like diabetes, obesity, hormone dependent cancers, infertility and other diseases that impact our life. All lifestyle diseases have different supporting factors. These can be grouped into three categories – genetic factors, lifestyle and environmental factors. The genetic factors are most difficult to influence but choices we make in our lifestyle causing the environmental factors we can influence.

Human health is correlated with environmental and animal health – it will influence our health directly as well indirectly.

EDC compounds have similar chemical structure than our hormones. We absorb these additives unfortunately on daily bases. When we get these substances into our organism then our organism is not aware of it – it does not recognise these substances as threats/ enemies. Some groups are more vulnerable than others. These are young children, pregnant women (impact on next generations). Studies show that EDC exposure influences



next 3 generations.

EDC exposure is permanent and important are also small doses – there is no safe dose. Important is to keep in mind that small lifestyle changes may lower the human EDs exposure, protect the environment and lower the risk of lifestyle diseases.

Studies have proven that small changes (e.g., not using plastic as food contact material) in our everyday life can lower the exposure nearly twice. The decrease of the exposure is possible and with that we also lower the pressure on the environment (our urine though cleaned will reach the environment and then back to us again).

Materials, recycling and EDCs

EDCs can be found in plastic, personal care products, pesticides in some other products as well but plastic is one of the main sources of the EDCs but not the only one. Tiers are resource of hazardous substances and also recycled tier material is has the same characteristics. Recycled material may have potentially the same properties and effects than the original material when we are talking about EDCs, but there is not yet enough proof to pinpoint this to full extend.

Burning the plastic waste is not a good alternative, though there are some technological options available, the best way forward is not to have to make that decision at all. Important is to reduce the use of the plastic.

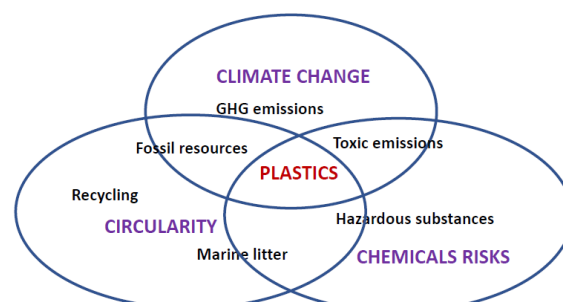
Hazardous substances and substances with endocrine disrupting properties can be found in many articles. However, in the end it does not really matter from where the EDC is coming – is it from the plastic, natural textile treated with chemicals for transport, other articles their effect to our organism is the same.

Making small but meaningful changes hopefully have cumulative effect that will lower in the end the body burden regarding hazardous substances.

Plastics, circularity and climate

Our society is in contact with plastics almost 24/7. The reason is that plastic is light, durable and low in cost at the first glance and provides us many services. The important questions to be asked are we using plastic in right place for right purpose and in the right context. It is prognosed that the plastic production and consumption is still increasing. Though the plastic is good material we have not taken care of the downside of the material – what do to with the material after the end of the material.

There is not much discussions regarding hazardous substances and circularity though some developments are ongoing (SKIP database etc). When putting into the plastic additives for achieving certain properties then we should think already at this stage what happens to the material at the end of



the life and if and how it can be recycled. These discussions have been focused on the direct exposure and impacts and the interlinkages are not fully understood yet.

Recycling of plastic products is not easy and, in many cases, not so straight forward as thought in the beginning. Chemical's recycling may be an option in this regard – this means taking the material back into chemical compounds. Good plastics or bad plastics – this decision is not easy to make as we do not have enough information and quite often the material is controversial.

Which material to choose

PVC – good thermoplastic but in burning creates dioxins. PVC as material is well recyclable but some softer PVC do contain many toxic additives. PVC can be considered good material but it is important to keep in mind – what is the application, where to use and how to use it.

Textile – most of fibres today are synthetic. Textiles as such are not really recyclable and question if the natural fibres are more environmentally friendly can also be asked. Especially in the context of lifecycle and taking into account all chemicals used during transport.

Biodegradable plastic – seems nice solution but at closer look it is very controversial. If the bioplastic is mixed with conventional plastic, then this can also cause serious problems in recycling system. The additives used may be slightly different in conventional and bioplastic but the properties can be similar.

Floor covering material – PVC or natural material. In many PVC floor covering other chemicals than phthalates are already used as plasticizers. However, some of these substances have rather similar structure to phthalates and therefor also toxic properties are expected. For private houses the natural materials are usually preferred (in case the price is acceptable) but in case of public houses the opinions vary more due to the maintenance and costs.

Decision to prefer one or the other material is not influenced only by properties but also by our lifestyle and feelings (what looks nice). The environmental impact can be reduced also by thinking through all aspects of the lifecycle of a product – and this is not so straight forward as thought at first glance.

15 April 2021 Behaviour change

Making the invisible visible

Insufficient environmental action is a function of 3 elements - policy failure, economic failure and collective day to day impact of the behavioural and lifestyle choices made by individuals. Behaviour change is explained by various models. Change can be influenced by personal and external factors as well by internal and external incentives. If one wants to reach the change it needs to start with the personal factors – the personal motivation for change – and different motivations need different approaches and arguments for triggering the actual action. It is

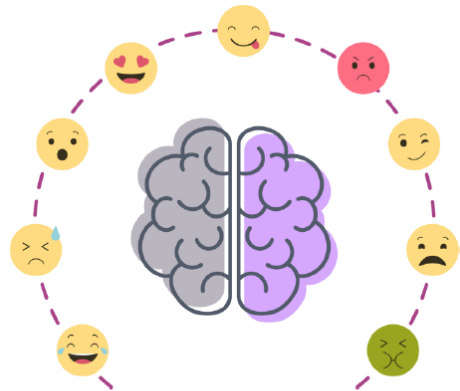
important not to leave aside also feelings and habits. The most important step towards the actual change is to understand what actually brings along the overcoming knowledge gap – one knows that action is needed but the actual action does not follow.

In environmental behaviour change (but not only here) it is important not to underestimate emotions as they create desires and impulses for action. These emotions can be very different for different areas – thus emotion triggering impulse/ desires for cosmetics can be different than for textile issues.

What has been proven as good motivation is following examples of role models and then following their actions. Final step in reaching the actual change is memorising the action and possibility to repeat it.

Role models are starting point for the behaviour change as they trigger ca 10% of persons to act and then next round is influenced by friends and relatives.

There can be found examples to show that shift/change is possible and has started in a way during a campaign – avoiding flying by scientists, veganism in Israel etc.



Source: UX Collective

For changing behaviour, it is important to overcome the barrier of the non-knowing and admitting that we only know bits and pieces. Plastic as such is not a bad material and it has become a part of our society because of its good qualities. Unfortunately, there is a lot we do not know yet and hazardous substances are part of the plastic.

For changing behaviour there is needed a personal touch and to turn the negative emotions into positive ones. Chemicals and positive emotions do not go hand-in-hand. In relation to hazardous substances in plastic this is rather difficult as we cannot touch the substances and their effects come vivid after certain time.

Behaviour change has to start from the more easily understandable areas – cosmetics, food contact materials, textile – in all these areas we have already some knowledge, more straight forward contact on personal level and thus the problem is more understandable. These areas all are more relevant for triggering a behaviour change due to personal and health aspect.

Each change starts with defining the correct action to be taken and the undesirable behaviour. For example, in case of food contact materials we want to avoid single use plastic take away boxes and use instead glass, ceramic or steel boxes.

Motivating behaviour change with regard to hazardous substances & plastics

Textile – the main barrier at the moment is still lack of knowledge and where to find reliable information about the issues. One of the barriers is also comfort and fashion what we are seeking in our cloths. Price can be important barrier as well especially when the reason behind the higher price is not so clear.

Messages are needed about sustainable textile both by influencers and by scientists and a reliable information source for getting information about textile and its production influences.

Cosmetics – long list of ingredients is difficult to understand, price of natural products is higher, refilling system is not yet common and complicated for the customer.

Solution would be preferring products with shorter list, use of modern apps, promoting more sustainable alternatives.

Food contact materials – also here the lack of knowledge is one of the main barriers. But also, emotional and financial issues are seen as barriers. Social norms are one very strong supporting factor for any behaviour change. Financial issues and handling of equipment can also be an obstacle.

As solution it is important to communicate the benefits of alternatives, give information and concrete hints for actions.

Barriers can for all these topics be in one way similar but from other hand the devil is in details and this determines actually the barriers. For finding the solution it is important to see it from various angles – availability of alternatives, comfort of using.

It is important to but into one complex the negative emotion and possible positive outcome.

Plastic diet campaign

Swedish cities active on Plastic management

Vasteras started plastic diet in February 2020 – to seek for solutions at local level that in the end influences global issues. Single use plastic has been reduced in Vasteras – no more plastic bottles during meetings, use of own cups for coffee and cutting boards.

The benefits of the plastic diet can be both environmental (no mor litter) but as well economical (no need to buy single use items thus saving funds).

The plastic diet in Vasteras has been focusing on reducing and removing unnecessary plastic but as well making investigations in city areas where plastic can be replaced with other alternatives.

Reduction of plastic during pandemic has been challenge but also on this time areas where plastic can be reduced can be found.

On the way is long term plastic strategy for Vasteras to continue the work that has been started during NonHazCity2 project.

Stockholm has started to look also at their plastic consumption (consumables, other plastics (e.g., packaging), inhabitants´ plastic use) and at categories that matter most. Statistics for different items purchased and used have been collected both by volume and users. Stockholm

has been using ca 2320 t of plastic consumables on 2019. Statistics includes also the type of the plastic and it source (fossil or renewable). Biggest amount (ca 760t) is polyethylene (PE). And as can



be seen there is a lot of different plastic items that are used.

As conclusion it can be stated that a lot of changes has to start at the user side and to procure alternatives to make the choice available.

Introduction of the idea and activities of Plastic Diet month – NonHazPlastic Diet

Plastic as a vector for hazardous substances will start on 3rd of May and will end on 13th June.

The synthetically produced material consists often of phenolic substances and is usually mixed with cocktails of additives. The additives may guarantee the desired functions of many items, such as a high flexibility (UV protection or flame retardance).

The problem is that additives and also residues from plastic production processes can leach out and can cause very negative effects on human's health and the environment. Consumers have learned a lot about plastic wastes on land, in oceans and dolphin bellies, about macro and microplastic particles the issue of hazardous substances in plastic materials and articles has not yet reached most of end users.

There have been many campaigns about reduction of the plastic use and with our campaign we would like to add this particular aspect to these campaigns. Hence, the current campaign is not focused just in reduction of plastic (quantities) and does not refer to climate change a priori, but it focusses on the principle of "informed choice and safe handling in the right context".

The campaign will last for 6 weeks and each week has own focus topic:

- i) textile;
- ii) sports equipment & bathing tools;
- iii) home accessories and decorations;
- iv) toys, children's furniture and accessories;
- v) food contact materials and
- vi) bioplastic.

The campaign is the EU Green Week partner event and will involve many EU and other countries – France, Portugal, Latvia, Lithuania, Estonia, Sweden, Germany, Poland to name few at the moment.