NonHazCity – key findings from the Hazardous Substance screening

The NonHazCity project aims at developing new strategies for reducing emissions of hazardous substances from urban sources.

Hazardous substances are everywhere in our daily life and are widely used by businesses in our cities. This results in many small emissions into the urban sewage system. NonHazCity will address small-scale emitters directly. Municipalities, businesses and private households are our target groups with the main goal of preventing hazardous substances from ending up in sewers and, ultimately, in the Baltic Sea.

Endocrine disrupting chemicals (EDCs)

Endocrine disrupting chemicals (EDCs) are a group of natural and synthetic chemicals that can mimic naturally occurring hormones or interfere with endocrine functions and lead to a range of adverse health effects in humans and wildlife. EDCs are strongly suspected of hampering reproductive functions, as well as exerting developmental, neurological, and immune system effects:

- Human health effects include developmental malformations, different types of cancer, neurodevelopmental delays in children, obesity, memory problems, diabetes and overall weakened immune responses.
- Wildlife effects include decreased reproductive success as well as developmental and behaviour changes in both marine and fresh water animals.

Products and articles used in everyday life as well as other sources in indoor and outdoor environments contain EDCs. These compounds have been found in many different product groups such as plastic materials, cosmetics, personal care products, cleaning products, paints, office supplies, toys, furniture, clothing and many others. EDCs can be emitted to the environment during the production phase, through the use of products and articles and with disposal. Examples of common EDCs are alkylphenols, phthalates, perfluorinated compounds (PFAS), bisphenols (BPA, BPS etc.), cadmium and many pharmaceuticals.

NonHazCity sampling campaign

Within the NonHazCity project a screening survey of hazardous substances has been performed in six municipalities around the Baltic Sea (Pärnu, Kaunas, Šilalė, Riga, Gdańsk, and Turku). Other cities including Stockholm and Västerås used existing data for comparison.

Samples were collected of wastewater from residential and industrial areas, wastewater treatment plants (WWTPs), stormwater and sewage sludge. Samples were screened for the occurrence of selected hazardous substances in order to identify local priority substances for further work in the project.

The overall conclusion from the screening survey is that the analysed substances were found in all types of samples in all investigated municipalities, meaning that these substances are widespread and originate from several different types of sources.

Some specific findings:

- Hazardous substances are universally present in municipal wastewaters.

- Concentrations of metals most often are within permitted levels in WWTP effluent. This suggests that earlier efforts to control metal pollution have been successful.
- Household use of everyday articles and products emits hazardous substances to wastewaters.
- All of the analysed substances were found in wastewater coming from residential areas.
- Phthalates, BPA, alkylphenols and PFAS are the substance groups most frequently detected in all wastewater types, sewage sludge and stormwater.
- Diclofenac, a pharmaceutical, was found in domestic wastewaters and in influent and effluent from WWTPs.
- WWTPs are important pathways for release of hazardous substances to the Baltic Sea which are emitted from upstream sources such as activities and materials used in households, municipal sources and businesses.
- When some substances reach WWTPs, they can be transformed into more hazardous substances and may also cause negative effects on the wastewater treatment process.

Our recommendations:

- Measures targeting upstream sources must become more important in the effort to reduce emissions of hazardous substances into the Baltic Sea.
- Heavy metals have been a big environmental problem in the past, but their levels are decreasing in the environment due to good management. Today, the focus should be on the widespread occurrence of EDCs and measures targeting emissions of these substances.

What can municipalities do?

In NonHazCity the local administrations are approached to develop appropriate strategies to phase out hazardous substances. Municipalities are responsible for school, care, traffic, street and park management, construction, etc. and can influence through making informed choices and by making demands. Criteria on hazardous substances must be integrated into public procurement practices. The partner cities are currently developing strategic Chemical Action Plans, and approaching different institutions in their municipalities to achieve a non-toxic everyday environment.

What can businesses do?

Businesses use a lot of products that contain hazardous substances in their operations. It could be in articles they produce, in services they perform or in the operation of their workshops, offices and sites. NonHazCity is implementing pilot actions with businesses to promote the reduction of emissions of hazardous substances – for example at hair dressers and beauty salons, hotels and hospitals, cleaning services, dry cleaners and car washing facilities, carpenters and other small workshops, print and copy shops, construction markets and many more. Targeted information material is produced and communication activities performed.

What can inhabitants do?

We all use products containing hazardous substances in our everyday life and in our households – detergents, body care, large varieties of plastics, paints, and electronics. We are aware that some of them are problematic, but for many products we do not think about the chemicals they contain. NonHazCity implements campaigns in its partner cities to make the inhabitants aware of their daily chemical use and help them to take an informed choice which will lead to a reduction of emissions of hazardous substances from households.