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| Document title | Final report on "Survey of polystyrene foam (EPS and XPS) in the Baltic Sea" |
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Background

Denmark is lead country for the implementation of action RL9 in the HELCOM Action Plan on Marine Litter:

- > *"Compile information on the prevalence and sources of expanded polystyrene (EPS) in the marine environment, and engage with industry to make proposals for alternative solutions (e.g. use of other materials, establishment of deposits, return and restoration systems, overpackaging reduction)."*
- > Further specification: - By 2017 an overview of the most significant sources of EPS ending up in the marine environment is produced, in cooperation with OSPAR. – Make recommendations to the Contracting Parties on voluntary agreements with the industry on changes in product design and applying best practices when handling EPS by 2019.

Denmark therefore initiated this study with the objective to gather knowledge on the prevalence and sources of EPS in the Baltic Sea, and to suggest possible measures to reduce the environmental load of EPS in the Baltic Sea.

As part of the preparation of the report, competent authorities in the HELCOM countries were contacted to collect data and information via questionnaires. The project was presented at WS RAP ML 3-2018 in Riga. Furthermore, the draft report was circulated to the HELCOM countries (PRESSURE and EN-Marine Litter contacts) for comments in Nov./Dec. 2018. As part of the survey, data have also been collected from relevant European and national industry associations. Furthermore, a draft report was submitted to the European trade association EUMEPS for comments. The results of the study will form the knowledge and decision-making basis for further work associated with the HELCOM Marine Litter Action Plan.

Two types of polystyrene foam, EPS and XPS (extruded polystyrene), are used for various purposes as further described in the report. As the two types are expected to behave similarly in the environment, the scope of the survey, originally focusing on EPS, has been extended to include both types.

The final report describes that EPS/XPS is buoyant and when released to the aquatic environment it is easily transported over long distances by rivers and sea currents. EPS/XPS is like other common plastic types: practically non-biodegradable, but due to the foam structure, easily fragmented into increasingly smaller pieces, leading to large numbers of EPS/XPS particles. EPS/XPS is non-toxic as a material; however, marine feeding organisms such as birds may mistake the EPS/XPS particles for food items and ingestion may result in malnutrition or death.

Beach litter monitoring indicates that EPS/XPS accounts for about 10% of the total sum of plastic beach litter items, but the variation among different beaches is high.

The releases by main application area have been estimated by use of the following general approach:

- Estimate quantities of EPS/XPS used for the application area - potential for releases to the environment;
- Confirm that releases from a certain source take place;
- Describe the release pathways;
- Estimate realistic emission factors and the potential releases.

Releases from the various applications/activities have been estimated with high uncertainties, but the estimates indicate that many sources contribute to the total environmental load. Based on estimations, the sources of EPS/XPS to the Baltic Sea are considered to be:

- › Construction materials: 3-29 t/year (excl. solid waste management);
- › Production of EPS/XPS articles: 0.5-40 t/year;
- › Solid waste treatment: 0.4-20 t/year;
- › Recreational activities: 0.5-20 t/year; it should be noted that the estimate for take-away packaging is extrapolated from Danish monitoring data only;
- › Fish boxes: 0.2-3 t/year;
- › Fishing tools: 0.06-0.9 t/year (excl. solid waste management).

The total releases of EPS/XPS are estimated to be on the order of 10-100 t/year. With a typical density of EPS/XPS of 15 - 20 kg/m³, this correspond to 700-5,000 m³ foam. To set it in perspective, the 10-100 t/year would correspond to 2.5-25 million items of a weight of 4 g (typical weight of an EPS coffee cup).

A catalogue of possible measures to reduce releases to the environment has been compiled. The measures are briefly described with benefits and challenges. See chapter 7.

The final report “Survey of polystyrene foam (EPS and XPS) in the Baltic Sea is attached to this document (contained in separate file [3-10-Att](#) – 166 pages).

Action requested

The Meeting is invited to:

- take note of the report,
- agree that the report provides an overview of the most significant sources of EPS ending up in the marine environment as requested by action RL9 in the RAP on ML and thus this part of the action is to be considered accomplished,
- based on the catalogue of possible measures to reduce releases to the environment (Chapter 7 of the report), discuss and agree on the way forward so that to conclude action RL9 (“Make recommendations to the Contracting Parties on voluntary agreements with the industry on changes in product design and applying best practices when handling EPS by 2019”).