



Measures to reduce the release of
hazardous substances
to the environment in the Baltic Sea region


Baltic Marine Environment
Protection Commission

Hazardous substances



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0. Summary

As part of the HELCOM 2021 Baltic Sea Action Plan (BSAP) the HELCOM Contracting Parties agreed to submit to HELCOM by 2023 an account listing, as detailed as possible, of the planned and implemented measures to reduce releases of hazardous substances in the environment, including available knowledge on their effects (BSAP action HL3). To implement this action the HELCOM Contracting Parties that are EU Member States - Denmark, Estonia, Finland, Germany, Latvia, Lithuania, Poland and Sweden - submitted the list of measures to reduce releases of hazardous substances included in their Programmes of Measures (PoM) for the EU Marine Strategy Framework Directive (MSFD) and Water Framework Directive (WFD). Overall, 179 measures in the PoMs were submitted. Out of these, 93 were from WFD PoMs and 86 from MSFD PoMs.

Many of the PoM measures were wide and consisted of many parts, e.g. making a strategy and awareness raising, and did not specify substances that were targeted. Out of the measures that did target specific substances, per- and polyfluoroalkyl substances/perfluorooctanesulfonic acid (PFAS/PFOS), copper, tributyltin, zinc (Zn) and polybrominated diphenyl ethers (PBDE) were the most common. The substance categories most frequently targeted were metals, industry products, and herbicides/pesticides. When considering target actors, WFD measures were more often directed towards industry, administration, or wastewater treatment plants while for MSFD measures the most common categories were shipping, administration, and general public/households. Since for many measures the substances targeted could not be specified, their respective link to HELCOM indicators could not be specified either. Information on effectiveness of measure was only received from Sweden but this information was not quantified.

Recommendations for further work include conducting research to evaluate the effectiveness of measures, enhancing cooperation among countries for information gathering, and developing a joint understanding of the matter. Additionally, it is advised to formulate measures with clear, tangible outcomes to facilitate the assessment of their effectiveness in reducing the environmental inputs of specific substances.

1. Introduction

As part of the HELCOM 2021 Baltic Sea Action Plan (BSAP) the HELCOM Contracting Parties agreed to submit to HELCOM by 2023 an account listing, as detailed as possible, the planned and implemented measures to reduce releases of hazardous substances in the environment, including available knowledge on their effects (BSAP action HL3). To implement this action the HELCOM Contracting Parties that are EU Member States were invited to submit the list of measures to reduce releases of hazardous substances included in their Programmes of Measures (PoM) for the EU Marine Strategy Framework Directive (MSFD) and Water Framework Directive (WFD) as well as information on their effectiveness, if possible. Russia was invited to submit national planned and implemented measures to reduce releases of hazardous substances in the environment, including available knowledge on their effects.

A list of measures was received from Denmark, Estonia, Finland, Germany, Latvia, Lithuania, Poland and Sweden.

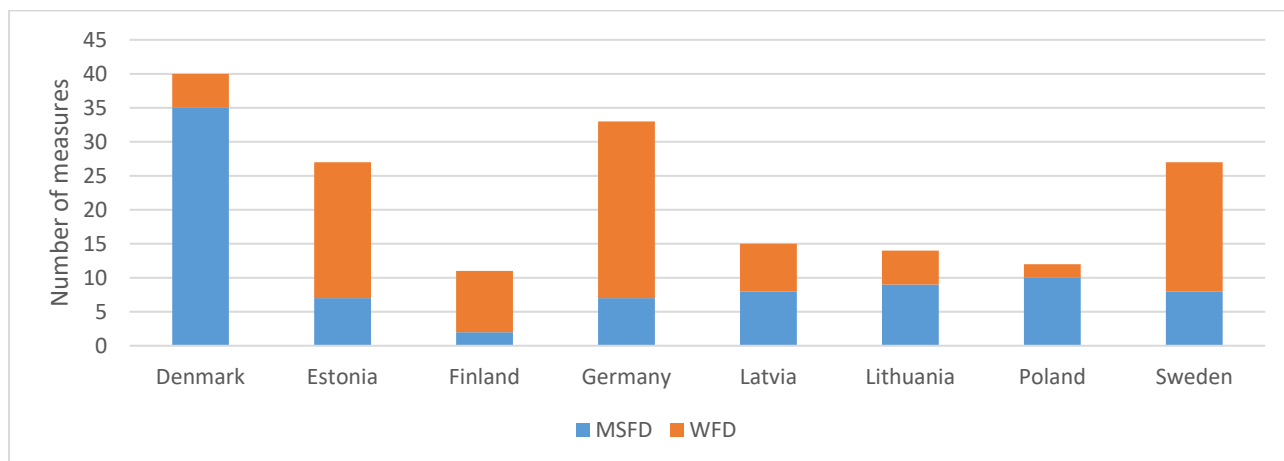


Figure 1. Number of measures to reduce releases of hazardous substances included in Programmes of Measures (PoM) for the EU Marine Strategy Framework Directive (MSFD) and Water Framework Directive (WFD) per country.

Overall, 179 measures in the PoMs were submitted. Out of these, 93 were from WFD PoMs and 86 from MSFD PoMs. Denmark had the most measures related to hazardous substances combined in both PoMs, followed by Germany and Estonia. It is worth noting that around one third of the Danish MSFD measures included in the analysis were supplementary measures. A list of all measures is included in annex 1.

The countries were invited to submit information on the substances the actions target as well as for effectiveness of measures. Information on effectiveness of measures was only received from Sweden. For this report, the measures were analysed based on the substances they target, target actors, modes of action, relevant HELCOM indicators and effectiveness of measures. It is worth noting that the analysis could be made more specific for countries that shared background reports where additional information on the measures could be found (Denmark, Estonia, Finland, Germany, Sweden). It is also good to note that the German WFD measures are a catalogue for federal states to choose from and that there is no information on which measures are implemented.

2. Substances targeted by measures

When looking at the submitted measures, it is clear that not all measures target specific substances or their groups – rather there are many measures directed more towards activities related to hazardous substance inputs (such as targeted measures towards better practices in shipping or more control in storm- or wastewater treatment). It is important to note that depending on the specific text of the measure, up to three different substance categories could be listed. Therefore, the number of different categories mentioned might be different from the total number of measures.

As seen from Figure 2, measures under MSFD were generally more specific in terms of targeted substances than the WFD measures, with 57% and 39% of all measures having a specific substance mentioned, respectively. These results might also be influenced by a large variation of details different Contracting Parties submitted together with their measures, for example Swedish MSFD data coming together with a lot of additional information on specifically targeted substances.

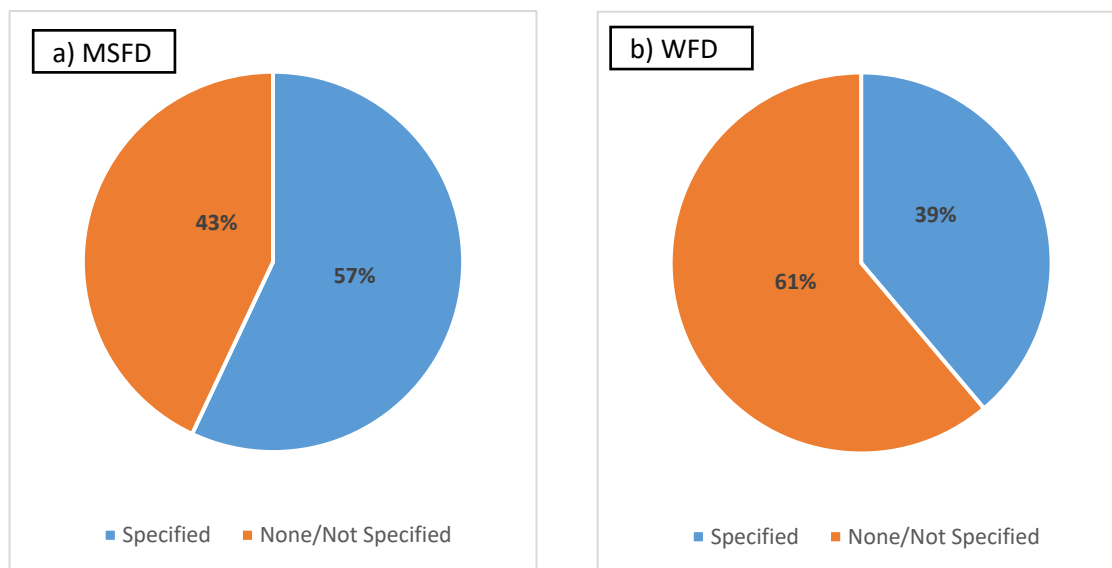


Figure 2. Percentages of submitted measures targeting specific substances or groups of substances. The measures are divided according to relevant EU framework, with subfigure a) showing measures in the Programme of Measures (PoM) for the MSFD and b) showing measures in the PoM for WFD.

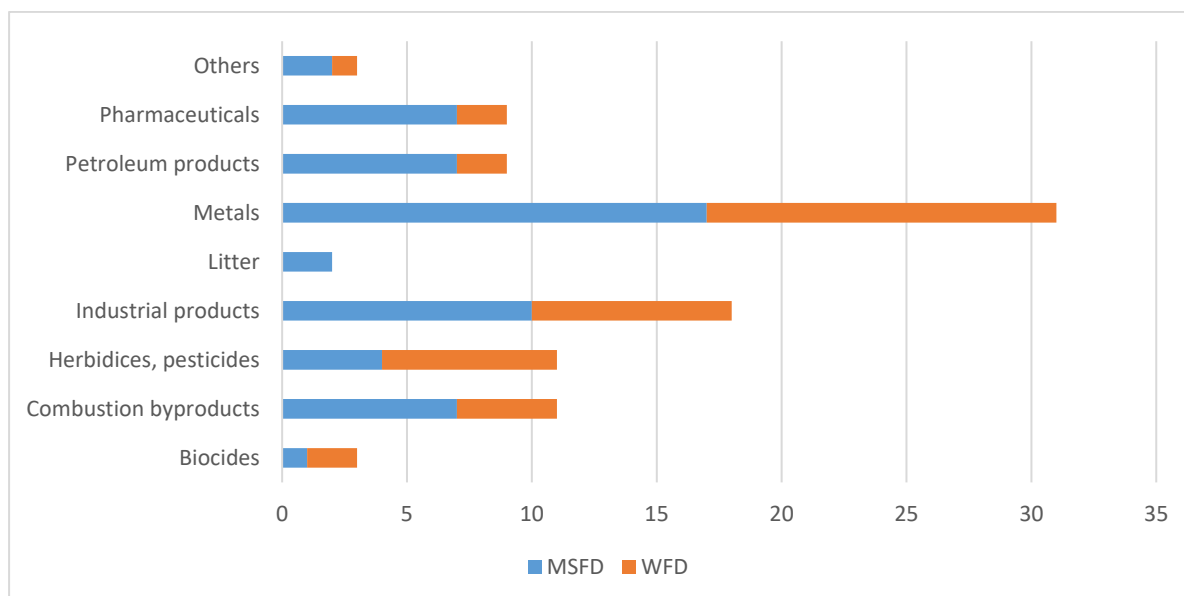


Figure 3. Number of measures for Marine Strategy Framework Directive (MSFD) and Water Framework Directive (WFD) targeting specific categories of substances. The figure only includes measures, which include a reference to a specific substance or a group. Please note that one measure could be included under up to three different substance categories.

Looking specifically into the targeted substance categories (Figure 3), there is some difference between the categories targeted by MSFD measures compared to WFD measures. Though both measures target different metals and heavy metals with the highest frequency (9 direct mentions for MSFD and 14 for WFD); the rest of the MSFD measures are more focused on pharmaceuticals, petroleum products and litter, whilst the WFD measures are more directed towards herbicides, pesticides, biocides and different industrial and combustion (by-)products.

For a statistical analysis, each substance or group specifically mentioned in the submitted measures were summed up and the results for all substances mentioned at least twice are presented in **Table 1**. Unsurprisingly, many substances belonging to the group of metals or heavy metals were mentioned most frequently (copper, mercury, tin and zinc most commonly; cadmium and lead with a bit lower frequency). PFAS (or often PFOS) were also very common targets for different measures, as were many other organic pollutants such as PBDEs, dioxins, PAHs, HBCDD, DDT/DDE, etc. Interestingly, comparing the results to the previous figure (**Figure 3**), pharmaceuticals were often mentioned as a group in the measures, while specific substances from the group were referenced only twice (diclofenac and different estradiols). A total of 46 specific substances or groups were mentioned once throughout all collected measures, often as part of a longer list (one measure from Latvia had a long list of POPs the measure targeted attached, which increased the total number). Some of the more distinct mentions were connected to buried ammunitions or chemical agents (mustard gas etc.) or to new topics gathering momentum in the environmental chemistry field (such as UV-filters).

Table 1. Substances or substance groups specifically targeted by at least two separate measures.

Substance/group	Times mentioned
Mercury (Hg)	11
Per- and Polyfluoroalkyl Substances/Perfluorooctanesulfonic Acid (PFAS/PFOS)	11
Copper (Cu; +1 for antifouling products)	10
Tributyltin (TBT; + 1 for antifouling products)	9
Zinc (Zn)	8
Polybrominated Diphenyl Ethers (PBDE)	7
Dioxins	6
Polycyclic Aromatic Hydrocarbons (PAHs)/Phenols	6
Cadmium (Cd)	5
Lead (Pb)	4
Polychlorinated Biphenyls (PCBs)	4
Hexabromocyclododecane (HBCDD)	3
Dichlorodiphenyltrichloroethane/-dichloroethylene (DDT/DDE)	3
Sulphur/Sulfates	3
Pharmaceuticals (diclofenac, estradiols, antibiotics)	3
Short-Chain Chlorinated Paraffins (SCCP)	2
Heptachlor	2
Oil	2
Hexachlorocyclohexanes (HCHs)	2
Hexachlorobenzene (HCB)	2

3. Target actors

Similarly to the previous analysis for substances, the measures were also categorized based on the specific actors or fields of activity they were directed towards (**Figure 4**). For this case, only a relatively small number of measures (almost 30 in total) had no specific target actor specified. Most of the measures had specific targets named in their text, with some measures also mentioning multiple actors. Several measures were also more complex, having a number of sub-measures, which meant that they were categorized under multiple actors if they were clearly indicated in the measure text or description. This was commonly seen with measures targeting the private sector, where first new legislation, plans, studies or procedures were needed (target actor “Administration”), before they could be enforced with the main target actor (“Industry” or “Shipping” most commonly). Expectedly, the most common target actor for measures under the MSFD PoM was shipping, while for WFD the target list was more varied, with administration, agriculture, industry, municipalities, and wastewater treatment plants most commonly mentioned.

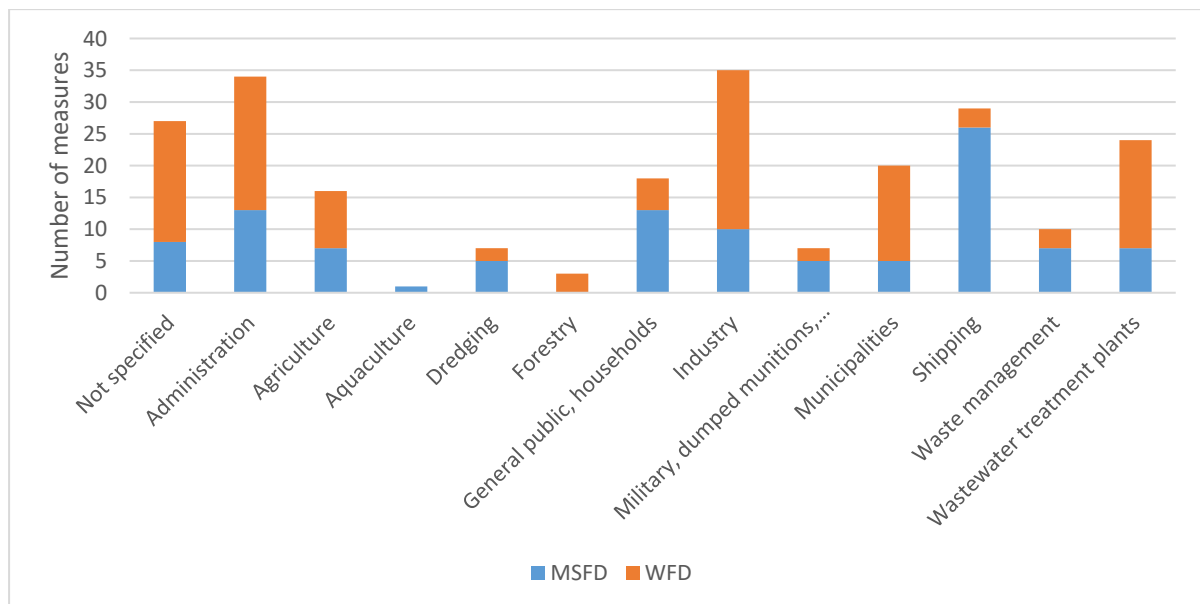


Figure 4. Total number of measures connected to specific target actors. Measures are differentiated based on the Programme of Measures they were included in, with measures for Marine Strategy Framework Directive (MSFD) coloured in blue and Water Framework Directive (WFD) coloured in orange. Please note that one measure could be categorized under up to three different target actors.

The get a clearer picture of the different actors targeted, a grouping was done on the basis of the overall sector these actors represent. The groups were made as follows:

- Public sector – includes target actors administration and municipalities.
- Private sector – includes target actors agriculture, aquaculture, dredging, forestry, industry, and shipping.
- General public – includes target actors general public, households.
- Waste – includes target actors waste management and wastewater treatment plants.
- Others – includes target actors that do not fit under other categories, such as military, dumped munitions, wrecks.

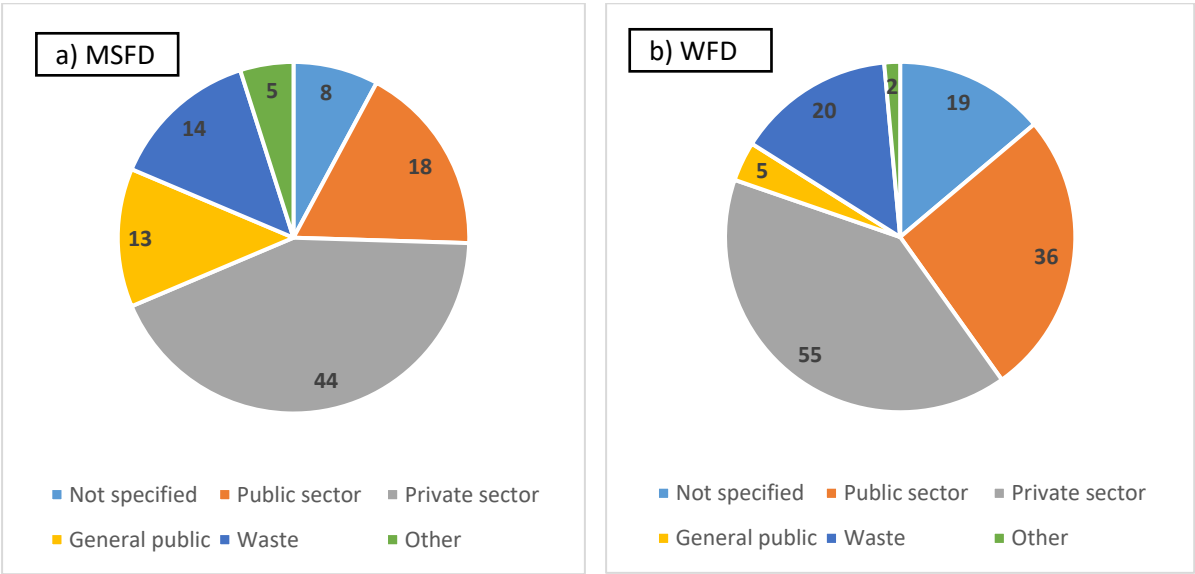


Figure 5. Target actors of the measures grouped together by sectors, subfigure a) displays the measures reported for the Marine Strategy Framework Directive (MSFD); and subfigure b) the measures reported for the Water Framework Directive (MSFD). The numbers in the figure represent the number of different measures connected to the sector. Please note that one measure could be categorized under up to three different target actors.

The results of grouping the target actor data are presented on **Figure 5**. For both programmes, the largest number of measures is directed towards the private sector, with the public sector being second. Both programmes also have a relatively similar share of measures connected to the waste sector, while for MSFD the general public was targeted more often than for WFD. The latter also has a higher number of measures without a specific target actor.

4. Modes of action

The measures were categorized based on their mode of action. There were many measures that were very wide and consisted of, for example, first conducting a study, then making a strategy followed by remediation or legislative actions. Thus, the same measure could be categorized under many, however no more than three, modes of action.

Figure 6 illustrates the variety of modes of action for the measures in MSFD PoMs. When measures were split into modes of actions so that one measure could be split up to three, 83 measures became 131. The most common mode of action was study or research. Also, legislative actions as well as guidance, strategy or plan were typical modes of action.

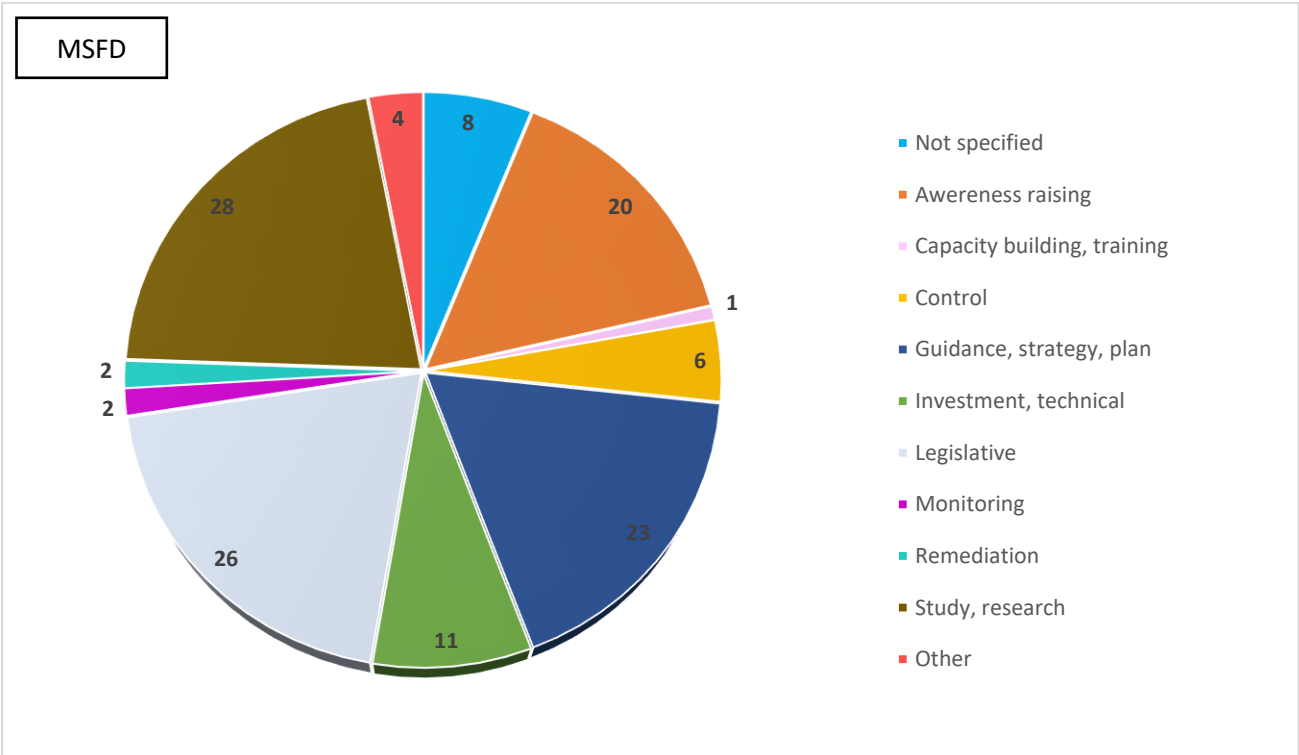


Figure 6. Modes of action for measures in the countries’ MSFD PoMs. Please note that one measure could be categorized under up to three different modes of action.

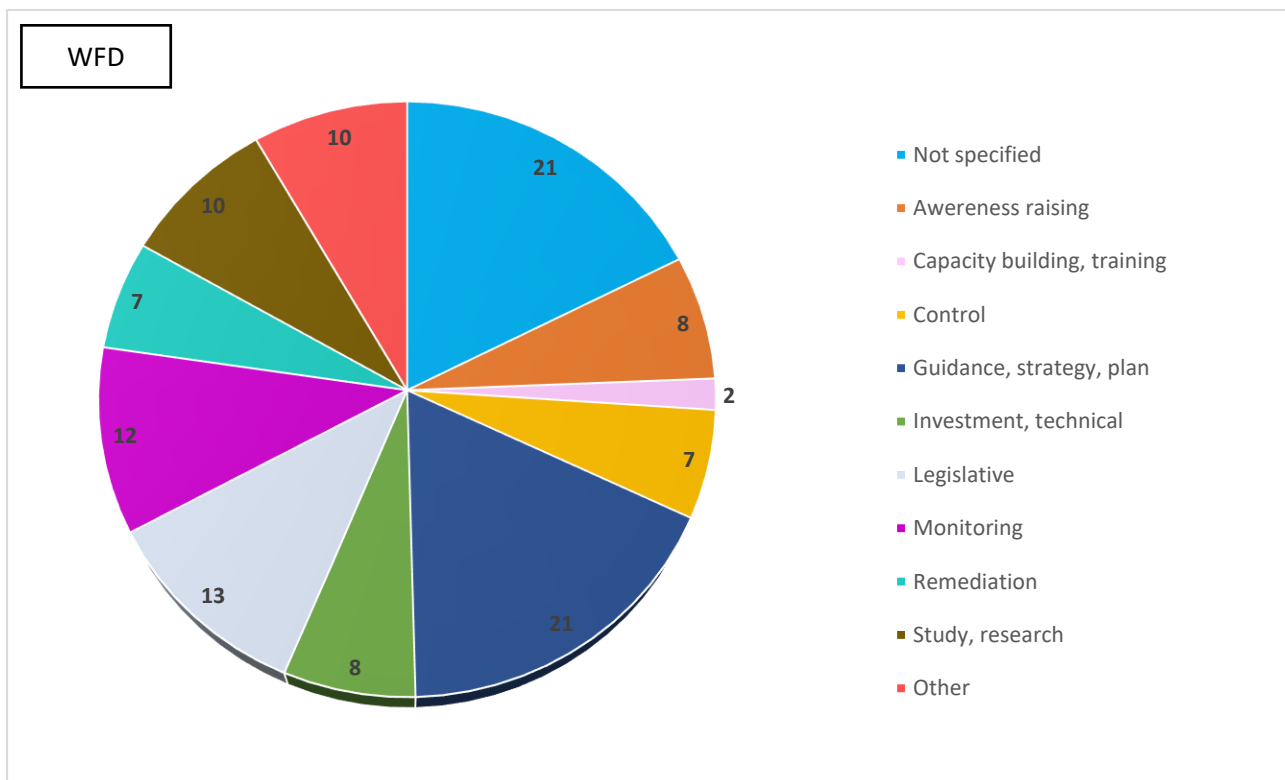


Figure 7. Modes of action for measures in the countries' WFD PoMs. Please note that one measure could be categorized under up to three different modes of action.

When the measures under WFD PoMs were split into modes of action, 93 measures amounted to 119 modes of actions. The mode of action was more difficult to specify for measures in the WFD PoMs than for those in MSFD PoMs and for 21 measures the mode of action could not be specified (**Figure 7**). The most common mode of action was guidance, strategy or plan. Also, legislative actions and monitoring were common modes of action.

5. Relevant HELCOM indicators

HELCOM indicators form the basis for assessing the status of the Baltic Sea. There are currently 16 indicators related to hazardous substances. The measures in the countries' PoMs were checked against the list of HELCOM indicators to see if they target the same substances as HELCOM indicators.

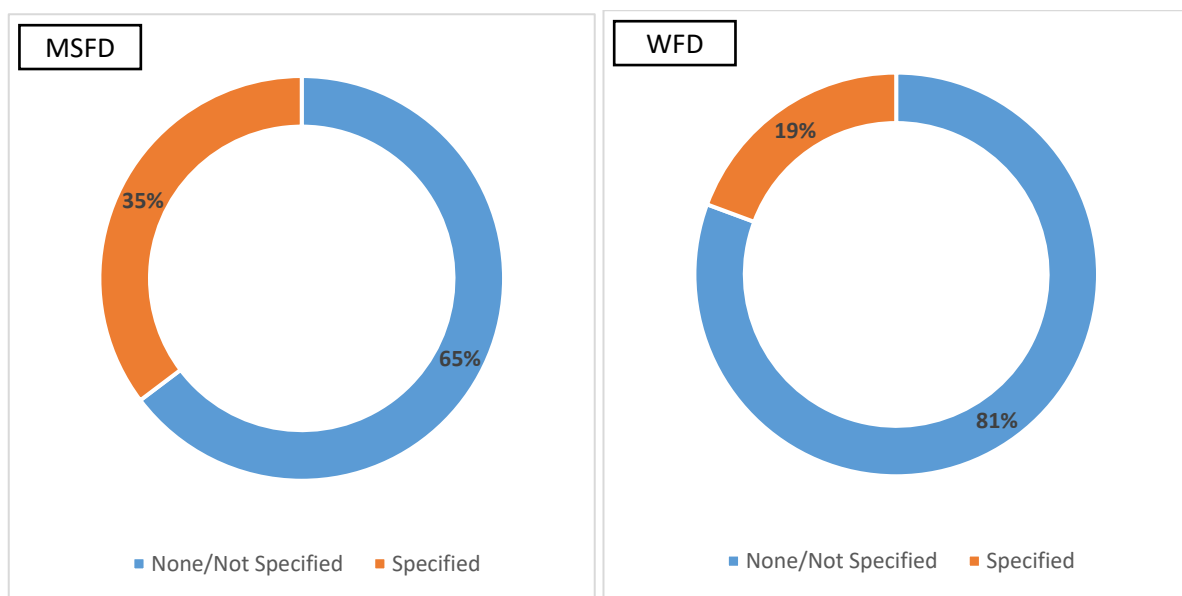


Figure 8. Percentage of measures related to hazardous substances in the countries' PoMs where link to HELCOM indicators can or cannot be specified, with subfigure a) showing MSFD and subfigure b) WFD data.

Due to the fact that for many measures the substances the measures are targeting could not be specified, for most measures the link to HELCOM indicators could not be specified. This is the case for 65% of measures in the MSFD PoM and 81% of measures in the WFD PoM (**Figure 8**). 15% of measures in the MSFD PoMs are linked to multiple HELCOM indicators and the same is true for 5% of measures in the WFD PoMs.

6. Effectiveness of measures

Information on effectiveness of measures was only submitted by Sweden which submitted information on the effectiveness of measures in their MSFD PoM on a scale of 1 to 5 or 1 to 7 based on expert opinion. All measures related to hazardous substances in the Swedish MSFD PoM were considered by the expert view to have an effectiveness of low to medium.

It is worth noting that many of the measures in the countries' programmes of measures were either very broad or were not measures to directly reduce inputs of hazardous substances, e.g. making a survey or improving monitoring, thus their effectiveness would not have been even possible to estimate.

7. Recommendations for future work on effectiveness of measures

The aim of the BSAP action was to receive information on national measures related to hazardous substances and their effectiveness. Very little information was received on the latter topic because currently the countries do not have quantifiable information available. The following recommendations propose next steps to further the evaluation of effectiveness of measures in the Baltic Sea region:

- National/joint: More research is needed to evaluate effectiveness of measures to reduce inputs of hazardous substances into the environment. This includes information on sources and pathways as well as effectiveness of individual measures.
- Joint: Cooperation between the countries for gathering information and forming a joint understanding of the key factors in evaluating effectiveness of measures would pool resources and further the matter for the whole region. The work could start e.g. with a regional project targeting some key substances that would be included as case studies for the development of a harmonised methodology.
- National: Wide horizontal measures could be cost-effective if the same measure targets many substances at once.. However, all measures should still aim to be concrete with clear and preferably measurable outputs, and include information on the substances they are targeting to be able to better evaluate their effectiveness in reducing the inputs of specific substances.

Annex 1. Measures submitted by countries

#	Country	Measure	MSFD or WFD
1	Estonia	Enhancing the management of hazardous pharmaceutical waste and raising awareness of environmentally friendly disposal of pharmaceuticals	MSFD
2	Estonia	Increasing pollution response capacity through the design and construction of a new buoy and research vessel with pollution control abilities (oil and other hazardous chemicals) and ensuring the comprehensive development of pollution response	MSFD
3	Estonia	Ensuring environmental safety of shipping	MSFD
4	Estonia	Preventing a potential increase of hazardous substances input from marine aquaculture	MSFD
5	Estonia	Managing environmental risks accompanying bunkering at sea	MSFD
6	Estonia	Management of direct discharges of stormwater to minimise the load of nutrients, contaminants and litter	MSFD
7	Estonia	Preparing and implementing minimum requirements for EIA and impact monitoring of blue economy development projects	MSFD
8	Estonia	Organizing the availability and use of biocides and products treated with biocides on the market	WFD
9	Estonia	Implementation of requirements related to registration, evaluation, authorization and restriction of chemicals	WFD
10	Estonia	Advice on proper waste water management	WFD
11	Estonia	Supervision of hazardous chemicals handling and safety requirements and record keeping	WFD
12	Estonia	Updating legislation on emissions of hazardous substances and establishing quality limit values	WFD
13	Estonia	Reducing and limiting the release of hazardous pollutants into the water under environmental permit conditions by setting, specifying and controlling discharge limit values	WFD
14	Estonia	Compilation of an overview of releases, releases and losses of hazardous substances	WFD
15	Estonia	Raising the awareness of residents about handling chemicals	WFD
16	Estonia	Control of the operation of sewage treatment plants, compliance with the requirements of rainwater and waste water discharged into the environment	WFD
17	Estonia	Limitation of pollutants in surface, groundwater and soil (establishment and updating of limit values in legislation)	WFD

#	Country	Measure	MSFD or WFD
18	Estonia	Compliance with international agreements or conventions that fulfill water protection objectives	WFD
19	Estonia	Application of environmental charge to water services from Industry	WFD
20	Estonia	State supervision of the water body	WFD
21	Estonia	Monitoring according to the water monitoring program 2022-2027	WFD
22	Estonia	Administrative capacity building	WFD
23	Estonia	Supervision of compliance with environmental requirements in ports	WFD
24	Estonia	Establishing requirements in the law to assess the contamination of seabed sediments and to prevent further pollution from the bottom sediments. Development and establishment of standards for pollutants (dangerous substances) for seabed sediments and updating of guidance materials in accordance with HELCOM instructions (Recommendation 36/2) to prevent pollutants from sediments entering the water column, including issuing environmental permits for dredging and dumping works in the sea, to prevent further pollution in the area with contaminated marine sediments, etc.	WFD
25	Estonia	Watch List survey	WFD
26	Estonia	Study to specify the effects of mercury precipitation from air emission sources and other ways of reaching into surface water. To model and calibrate with measurements (measurements in precipitation, surface water and, if necessary, in other related matrices) the spread of mercury from air emission sources, in order to find out the movement path of air-borne mercury reaching water bodies and a possible connection with local emission sources. Specify and estimate the amount of mercury reaching water bodies from the air (including precipitation, rainwater and waste water). Assess the adequacy of measures to reduce mercury from air sources and their water protection aspects. If necessary, develop solutions to limit emissions from local sources of mercury.	WFD

#	Country	Measure	MSFD or WFD
27	Estonia	Study of emissions resulting from waste management to specify the local sources of pollutants reaching the environment in terms of substances of the Stockholm Convention and in terms of substances standardized in waste that cause a bad status of waterbodies. (PBDE, SCCP, HBCDD, DDT, Hg, Cd, Pb) The study provides an answer to the question of whether PBDE, which today causes a bad status in aquatic biota, also has local sources in Estonia, for which additional reduction measures should be planned. Together, the data needs for the implementation program of the Stockholm Convention are fulfilled. The study is conducted at waste management companies. By mapping the cleaning technologies in use, measuring the contents of hazardous substances in rainwater, sewage and waste water and, if necessary, planning additional measures to reduce emissions.	WFD
28	Finland	Reduce the negative impacts of antifouling products. This measure includes limits on the use of copper, improving harbors, increasing surveillance and guidance.	MSFD
29	Finland	Investigation impacts of sulphur scrubbers and regulation for their use	MSFD
30	Finland	Monitoring programme for hazardous substances	WFD
31	Finland	Improving management of hazardous substances and supporting substitution actions. Improving surveillance and monitoring in industry. Risk management plans in industry.	WFD
32	Finland	Development of environmental permitting and surveillance processes in mining	WFD
33	Finland	Maintenance and improvement of waste water treatment plants. Improving the coverage of the sewer system especially in rural areas. Investigations of emissions of hazardous substances from WWTPs.	WFD
34	Finland	Improving storm water management	WFD
35	Finland	Reducing the use of plant protection products	WFD
36	Finland	Investigation on the impact of forestry practices on mercury emissions	WFD
37	Finland	Risk management for acidic sulfate soils	WFD
38	Finland	Remediation of contaminated soils	WFD
39	Germany	Management of dumped munitions Information campaign: proper disposal of pharmaceuticals – focus: seagoing ships	MSFD
40	Germany	Criteria and incentive systems for environmentally friendly ships	MSFD

#	Country	Measure	MSFD or WFD
41	Germany	Information campaign: raising awareness of the environmental impacts of UV filters in sunscreen lotions	MSFD
42	Germany	Working towards a reduction in the discharge of cargo residues of solid bulk goods into the sea	MSFD
43	Germany	Examination of the possibilities of a scheme for using the German Bight Western Approach traffic separation area for large container ships	MSFD
44	Germany	Active support of EU and IMO activities through investigation of measures to facilitate the location, tracking and recovery of containers lost at sea, container debris and content	MSFD
45	Germany	Improving traceability and tackling marine pollution by procuring a survey vessel for the German North Sea	MSFD
46	Germany	Expansion of municipal wastewater treatment plants to reduce other substance inputs. Technical expansion (upgrade) to reduce other material loads, e.g. micropollutant removal by means of suitable processes	WFD
47	Germany	New construction and adaptation of plants for the drainage, treatment and retention of mixed and rainwater. New construction and expansion of existing plants for drainage, treatment (e.g. for high copper and zinc loads and/or high ultrafine sediment contents in rainwater) and for the retention of mixed and precipitation water	WFD
48	Germany	Optimization of the operation of plants for the discharge, treatment and retention of mixed and precipitation water. Modification or reconstruction (conversion) of existing combined sewer treatment and stormwater drainage plants to achieve the level of generally accepted rules of technology	WFD
49	Germany	Other measures to reduce substance inputs from combined and precipitation water discharges. Measures in the area of combined and stormwater discharges that are not to be assigned to one of the above-mentioned sub-areas (see Nos. 10 & 11)	WFD
50	Germany	New construction and adaptation of industrial/commercial wastewater treatment plants. New wastewater treatment plants and the expansion of existing wastewater treatment plants in terms of purification performance	WFD
51	Germany	Optimization of the operation of industrial/commercial wastewater treatment plants. Improvement of cleaning efficiency through modified control or reconstruction (conversion) of individual elements (not maintenance)	WFD
52	Germany	Other measures to reduce substance inputs from industrial/commercial wastewater discharges. Measures in the area of industrial/commercial wastewater discharges that are not to be assigned to one of the above-mentioned sub-areas (see Nos. 13 & 14)	WFD

#	Country	Measure	MSFD or WFD
53	Germany	Measures to reduce point sources of substance inputs from mining. Measures to reduce or optimize the control of point sources from mining (except wastewater, rainwater and cooling water), e.g. Measures for mine water treatment, quality management of the discharge of mine or tailings pile water, preparation of feasibility studies	WFD
54	Germany	Measures to reduce substance inputs from other point sources. Measures to reduce substance inputs from point sources that are not to be assigned to one of the above-mentioned exposure groups (cf. Nos. 1 to 17)	WFD
55	Germany	Measures to reduce punctual substance inputs from industrial/commercial sites. Measures to reduce punctual inputs of substances with a direct impact on the GW (except wastewater, rainwater and cooling water), e.g. Official adjustment of the injection permit for saltwater disposal	WFD
56	Germany	Measures to reduce punctual substance inputs from mining. Measures to reduce punctual inputs of substances from mining with a direct impact on GW (excluding wastewater, rainwater and cooling water)	WFD
57	Germany	Measures to reduce selective substance inputs from contaminated sites and old sites. Measures to reduce selective substance inputs from contaminated sites with direct effects on the GW, e.g. remediation of contaminated sites (incl. further investigations in accordance with BBodSchG)	WFD
58	Germany	Measures to reduce punctual substance inputs from waste disposal. Measures to reduce punctual substance inputs from waste disposal with a direct impact on GW, e.g. remediation of landfills	WFD
59	Germany	Measures to reduce substance inputs from other point sources. Measures to reduce punctual substance inputs with direct effects on the GW that cannot be assigned to one of the above-mentioned pollution groups (see Nos. 19 to 22)	WFD
60	Germany	Measures to reduce diffuse loads resulting from mining. Measures to reduce uncontrolled diffuse pollution (e.g. salinization, acidification, ochre, heavy metal pollution) as a result of mining (incl. pilot projects and specific monitoring monitoring)	WFD
61	Germany	Measures to reduce diffuse substance inputs from contaminated sites and old sites. Measures to reduce uncontrolled diffuse material pollution from contaminated sites, e.g. remediation of contaminated sites (incl. further investigations in accordance with BBodSchG)	WFD
62	Germany	Measures to reduce diffuse material inputs from paved surfaces. Measures to reduce uncontrolled diffuse material loads on paved surfaces, e.g. decoupling of sealed surfaces from the sewer network, unsealing of surfaces to increase the infiltration rate, greening of roof surfaces	WFD

#	Country	Measure	MSFD or WFD
63	Germany	Measures to reduce inputs of plant protection products from agriculture. Measures to reduce the entry of PPPs. Here: concrete measures such as promotion of spreading technology, application bans Note: Advisory measures for PPPs are to be booked under Conceptual Measures.	WFD
64	Germany	Measures to avoid accidental entries. Measures to prevent accidental entries in the OW or preparatory measures to mitigate damage	WFD
65	Germany	Measures to reduce exposure from other diffuse sources. Measures to reduce substance inputs from diffuse sources that are not to be assigned to one of the above-mentioned exposure groups (see Nos. 24 to 35)	WFD
66	Germany	Measures to reduce diffuse loads resulting from mining. Measures to reduce GW pollution due to mining (e.g. heavy metals, sulphate) (incl. pilot project and specific monitoring monitoring)	WFD
67	Germany	Measures to reduce substance inputs from building materials/structures. Measures to reduce substance inputs from building materials and structures (e.g. zinc, copper, sulphate, biocides)	WFD
68	Germany	Measures to reduce inputs of plant protection products from agriculture. Measures to reduce GW contamination with plant protection products from agricultural land	WFD
69	Germany	Measures to reduce exposure from other diffuse sources. Measures to reduce GW pollution from diffuse sources that are not to be assigned to one of the above-mentioned load groups (cf. Nos. 37 to 43)	WFD
70	Germany	Measures to reduce material contamination from sediments. Measures to reduce uncontrolled diffuse material pollution, e.g. through the removal of sediments, with subsequent treatment, recycling and disposal if necessary	WFD
71	Germany	Measures to reduce acidification-related pollution (without nutrients) in groundwater as a result of agriculture. Measures to reduce the acidification of groundwater with subsequent release of metals and metalloids as a result of agriculture. Suitable measures are, for example, liming or reducing fertiliser intensity.	WFD
72	Latvia	Implementation of measures proposed in the National Implementation Plan (NIP) for Persistent Organic Pollutants. English summary and the list of proposed measures can be found here: https://www.vestnesis.lv/wwwraksti//2022/172/BILDES/R_583/KR583P2.DOCX	MSFD
73	Latvia	Ensure air quality standards and eliminate Hg emissions in waste incineration plants by using BAT technologies	MSFD

#	Country	Measure	MSFD or WFD
74	Latvia	Public information and education campaigns about marine pollution by PBDE, PFAS, pharma, etc), sources of pollution, how to prevent pollution of marine environment.	MSFD
75	Latvia	Survey of hazardous substances in marine sediment with an aim to assess the presence of pollutants, distribution, long-term trends and efficiency of implemented measures. If needed establish environmental quality standards for pollutants in marine sediment.	MSFD
76	Latvia	Assess legal acts regulating port dredging works, including contaminated sediments.	MSFD
77	Latvia	Elaborate legal acts to prevent TBT emissions during ship repair and hull maintenance.	MSFD
78	Latvia	Promote the use of TBT-free anti-fouling paints on recreational vessels	MSFD
79	Latvia	Promote the replacement of materials and products used in industry, energy and maritime sectors that contain hazardous substances (such as PBDE, PFOS) with materials and products that do not contain these substances (for example, fire-fighting foam, textile materials, in plastic, building materials, etc.).	MSFD
80	Latvia	Determine the sources of heptachlor, heptachlor epoxide, mercury and implement measures to reduce its pollution (monitor heptachlor, heptachlor epoxide, mercury in surface water; perform data analysis to identify the source of pollution, implement measures to reduce pollution).	WFD
81	Latvia	Carry out fluoranthene monitoring in wastewater, surface water.	WFD
82	Latvia	Monitor anthracene in surface water.	WFD
83	Latvia	Determine the sources of PFOS (monitor PFOS in surface water, monitor wastewater discharges).	WFD
84	Latvia	Monitor the phenolic index in surface water.	WFD
85	Latvia	Carry out operational and trend monitoring in the fish matrix for chemical quality control.	WFD
86	Latvia	Determine the sources of tributyltin (monitor tributyltin in surface water, monitor SIA "Liepajas kuģu būves rūpnīca" in the wastewater discharge N400251).	WFD
87	Lithuania	Increase the efficiency of wastewater treatment at wastewater treatment plants, taking into account water protection goals.	MSFD
88	Lithuania	Review the issued TIPK and Pollution permits, to determine the concentrations of wastewater discharged in them.	MSFD

#	Country	Measure	MSFD or WFD
89	Lithuania	Assess the need for ratification of the 2020 Protocol on preparedness, action and cooperation in the event of incidents of pollution by hazardous and noxious substances (OPRC/HNS 2000).	MSFD
90	Lithuania	Assess the need for ratification of the 2010 Protocol to the International Convention on Liability and Compensation for Damages relating to the Carriage of Dangerous and Noxious Substances by Sea (HNS Convention), the need for ratification by interested parties and, if necessary, to initiate the ratification of this Protocol (this Protocol will not bring the HNS Convention into force in 1996).	MSFD
91	Lithuania	Amend the Rules for excavation of soil in the waters of sea and seaports and the removal of excavated soil" to reduce the impact of the removed soil on the marine environment, to update the procedures for soil management and classification by providing for the possibilities of the targeted use of the soil (restoring beaches, in agriculture, in construction works), provide additional alternatives to soil management of pollution class IV, update the requirements for mandatory chemical testing of soil properties.	MSFD
92	Lithuania	Review the requirements for determining the characteristics of the good environmental status of the Baltic Sea Area, and, if necessary, update the limit values for the assessment of bottom sediment pollution taking into account the limit values for sediments agreed for the region, the natural geochemical background of pollution, fine fractions of bottom sediments and organics content the distribution of the bottom in sediments.	MSFD
93	Lithuania	Conduct educational and information campaigns aimed at spreading more widely information about the responsible treatment of household chemicals and hazardous substances so that they do not enter the environment.	MSFD
94	Lithuania	Conduct educational and information campaigns to inform the public about the environmental prevalence, persistence and harmful effects of pharmaceutical substances.	MSFD
95	Lithuania	Conduct educational and information campaigns about the release of hazardous substances in the following branches of the economy: paint industry, production of metalworking, plastics, building materials, car washes, use and manufacture of cleaning products for industrial and domestic purposes, use and display of liquids for pneumatic devices, processing of fabrics and leather, metallurgy, machine-building, electroplating processes, coal burning; burning of fossil fuels, refineries, painting and processing of ship hulls.	MSFD
96	Lithuania	To increase the efficiency of wastewater treatment at wastewater treatment plants, taking into account water protection goals.	WFD

#	Country	Measure	MSFD or WFD
97	Lithuania	To review the issued TIPK and Pollution permits, to determine the concentrations of wastewater discharged in them.	WFD
98	Lithuania	To carry out educational and information campaigns aimed at spreading more widely information about the responsible treatment of household chemicals and hazardous substances so that they do not enter the environment.	WFD
99	Lithuania	Conduct educational and information campaigns to inform the public about the environmental prevalence, persistence and harmful effects of pharmaceutical substances.	WFD
100	Lithuania	To conduct educational and information campaigns about the release of hazardous substances in the following branches of the economy: paint industry, production of metalworking, plastics, building materials, car washes, use and manufacture of cleaning products for industrial and domestic purposes, use and display of liquids for pneumatic devices, processing of fabrics and leather, metallurgy, machine-building, electroplating processes, coal burning; burning of fossil fuels, refineries, painting and processing of ship hulls.	WFD
101	Poland	N_18 Combined sewer overflows - an analysis of the scale of the problem and an action plan	MSFD
102	Poland	N_29 Utilization of dredging wastes and rational management of dredging material	MSFD
103	Poland	N_30 Surveys of installations emitting heavy metals to air and water	MSFD
104	Poland	N_31 Volunteer campaign – cleaning up river banks and lakeside beaches	MSFD
105	Poland	N_32 Strategy for reducing transfer of solid wastes from sewers to surface waters	MSFD
106	Poland	BALPL-M041 Modernization of the MPS depot in the K-4001 Gdynia military complex	MSFD
107	Poland	BALPL-M038 Increasing the effectiveness of combating pollution at sea	MSFD
108	Poland	BALPL-M034 Investigation of the scale of environmental threats resulting from the presence of wrecks on the seabed	MSFD
109	Poland	BALPL-M030 Concessions and environmental decisions for projects involving the identification, exploration and exploitation of offshore deposits (guidelines for authorities issuing administrative decisions)	MSFD
110	Poland	BALPL-M037 Preparation and implementation of a plan to combat oil-derived pollution on the seashore	MSFD

#	Country	Measure	MSFD or WFD
111	Poland	reviews of water permits for compliance	WFD
112	Poland	Update of regional environmental protection programs	WFD
113	Sweden	ÅPH 15 - Develop guidance aimed at authorities and commercial operations for the disposal of contaminants and fouling in the cleaning of ship hulls.	MSFD
114	Sweden	ÅPH 16 - Improved management of contaminated sediments	MSFD
115	Sweden	ÅPH 17 - Reduce the spread of contaminants from recreational crafts	MSFD
116	Sweden	ÅPH 37 - Countering the dispersal of contaminants in marine areas with dumped ammunition and chemical warfare agents.	MSFD
117	Sweden	ÅPH 38, Minimise the environmental pressure of shipping on the marine environment.	MSFD
118	Sweden	ÅPH 39 - Expert support for oil pollution protection.	MSFD
119	Sweden	ÅPH 40 - Reduce the use of biocide containing anti-fouling paints on leisure boats.	MSFD
120	Sweden	ÅPH 41- Active phase-out of two-stroke engines with carburettors on leisure boats.	MSFD
121	Sweden	Environmental supervision	WFD
122	Sweden	Inspections of wastewater	WFD
123	Sweden	Guidance on inspections and self-monitoring	WFD
124	Sweden	Preventive measures to reduce emissions and their dispersion	WFD
125	Sweden	Interadministrative planning for the implementation of the programme of measures	WFD
126	Sweden	Environmental supervision and assessment	WFD
127	Sweden	Dioxins from small-scale combustion	WFD
128	Sweden	Impacts of pharmaceutical substances	WFD
129	Sweden	Cross-sectorial planning for the implementation of the programme of measures	WFD
130	Sweden	Guidance for municipalities	WFD

#	Country	Measure	MSFD or WFD
131	Sweden	Prioritization of remediation of contaminated areas	WFD
132	Sweden	Guidance for supervision of environmentally hazardous activities	WFD
133	Sweden	Guidance related to contaminated areas	WFD
134	Sweden	Guidance on supervision of air emissions	WFD
135	Sweden	Instruments and guidance for handling of stormwaters	WFD
136	Sweden	Guidance on contaminated waste and masses	WFD
137	Sweden	Collection of PFAS emissions data	WFD
138	Sweden	Dissemination of information	WFD
139	Sweden	Measures for ecologically functional buffer zones	WFD
140	Denmark	Water area plans 2021-2027 (VP3) as well as agreement on the green transition of Danish agriculture.	MSFD
141	Denmark	Strategy for environmentally hazardous substances - A water environment without dangerous chemicals	MSFD
142	Denmark	Reduction of discharge of untreated wastewater	MSFD
143	Denmark	Enhancement of nature and environmental considerations during the dumping of dredged seabed material.	MSFD
144	Denmark	Restrictions for products containing mercury under the Minamata Convention.	MSFD
145	Denmark	Pesticide Strategy 2022-26	MSFD
146	Denmark	Substances restricted under the REACH Regulation ((EC) No. 1907/2006) as well as included in the candidate list under REACH*	MSFD
147	Denmark	The Stockholm Convention on Persistent Organic Pollutants and the POP Regulation ((EU) 2019/1021)*	MSFD
148	Denmark	Classification of chemical substances and identification of substances as particularly problematic*.	MSFD
149	Denmark	The Fertilizer Regulation ((EU) 2019/1009) – threshold values for environmentally hazardous substances*.	MSFD
150	Denmark	Remediation of legacy pollution sites*	MSFD
151	Denmark	Chemical Action Plan 2022-25	MSFD

#	Country	Measure	MSFD or WFD
152	Denmark	Biocide Action Plan 2022-25	MSFD
153	Denmark	Information campaign to reduce pharmaceutical residues in the marine environment	MSFD
154	Denmark	Setting limits for PFAS in surface water and sewage sludge	MSFD
155	Denmark	Efforts targeting mercury, including the phase-out of silver amalgam*, requirements for filters in dental clinics, and guidance on handling waste containing mercury*.	MSFD
156	Denmark	Efforts targeting TBT and other antifouling paints, including the ban of TBT under the AFS Convention*, an information campaign for the safe use of antifouling paints*, and the antifouling paint regulation*.	MSFD
157	Denmark	Efforts targeting PCB, including updating the residual product regulation*, waste to soil regulation*, and guidance on handling waste containing PCB*, among others.	MSFD
158	Denmark	Efforts targeting dioxins, including a change of ownership program for wood stoves*, scrappage schemes*, information campaigns*, and the possibility of banning older wood stoves, among others.	MSFD
159	Denmark	Ban on lead in rifle ammunition for hunting	MSFD
160	Denmark	Efforts targeting veterinary use of zinc and control measures in agriculture against the use of zinc oxide.	MSFD
161	Denmark	Efforts aimed at reducing the use of antibiotics in Danish pig production.	MSFD
162	Denmark	Efforts targeting wastewater, including advisory opinions for hospital wastewater* and derived effects for environmentally hazardous substances through various interventions*.	MSFD
163	Denmark	Transition to organic farming, including the launch of the Growth Plan for Danish Organic Agriculture*, provision of organic area subsidies, funds for organic investment support, national marketing, export promotion, and sector development*.	MSFD
164	Denmark	Assessment of environmental impacts, socioeconomic consequences, and options for action regarding scrubber discharges.	MSFD
165	Denmark	Risk assessment and potential courses of action for dumped ammunition in the Baltic Sea.	MSFD
166	Denmark	Monitoring projects focusing on new techniques (non-target) for detecting environmentally hazardous substances.	MSFD
167	Denmark	Investigation of alternative dumping techniques and handling of dumped material.	MSFD
168	Denmark	Establishment of conversion factors in fish for a range of metals.	MSFD
169	Denmark	Projects under the Danish Environmental Protection Agency's Pesticide Research Program.	MSFD

#	Country	Measure	MSFD or WFD
170	Denmark	Projects under MUDP and GUDP related to environmentally hazardous substances.	MSFD
171	Denmark	Updating and development of various guidance materials regarding the discharge of environmentally hazardous substances for use by environmental authorities.	MSFD
172	Denmark	Investigation of environmentally hazardous substances in sewage sludge.	MSFD
173	Denmark	Modeling project for environmentally hazardous substances	MSFD
174	Denmark	Assessment of historical wrecks in coastal waters.	MSFD
175	Denmark	Wastewater intervention dispersed settlement	WFD
176	Denmark	Wastewater intervention rain-induced discharges (lake and stream)	WFD
177	Denmark	Pesticide strategy for 2017-2021 and supplementary agreement on areas for drinking water extraction and mass screening, etc.	WFD
178	Denmark	The Soil Contamination Act	WFD
179	Denmark	Acquisition of fish farms	WFD