Outcome of the Intersessional Meeting of HELCOM Working Group on Reduction of Pressures from the Baltic Sea Catchment Area (PRESSURE 14B-2021)

Introduction

0.1 In accordance with the decision by PRESSURE 14-2021 (Outcome, paragraph 7.13) the Intersessional Meeting of the HELCOM Working Group on Reduction of Pressures from the Baltic Sea Catchment Area was held online, on 24 May 2021.

0.2 The Meeting was attended by representatives from Denmark, Estonia, Finland, Germany, and Sweden. An Observer from BFFE also attended the Meeting. The List of Participants is contained in **Annex 1**.

0.3 The Meeting was chaired by Mr. Lars Sonesten, Chair of the Pressure Group. Mr. Dmitry Frank-Kamenetsky and Ms. Susanna Kaasinen, from the HELCOM Secretariat acted as secretaries of the Meeting.

Agenda Item 1 Adoption of the Agenda

1.1 The Meeting adopted the agenda as contained in document 1-1.

Agenda Item 2 Additional information for the actions in the updated BSAP

2.1 The Meeting recalled that PRESSURE 14-2021 considered the additional information on BSAP actions related to the Pressure group, agreed in general on the proposals for some actions as well as agreed to organize an intersessional meeting to complete the task.

2.2 The Meeting took note that the additional information will be included in a supporting document for the updated BSAP which will be approved by the HELCOM Heads of Delegation at an intersessional meeting in September 2021.

2.3 The Meeting took note of the draft additional information for the remaining actions relevant for the Pressure group (document 2-1).

2.4 The Meeting recognized that the additional information to action EN18 regarding the revision of the Recommendation 28E/5 on Municipal wastewater treatment makes it relevant for both the Eutrophication and Hazardous substances and litter segment of the updated BSAP.

2.5 The Meeting took note of the view by Denmark that the current Recommendation 28E/5 does not address hazardous substances and that the strengthening of the Recommendation does not necessarily mean widening the scope of the Recommendation beyond nutrients.

2.6 The Meeting noted that the HODs will review the additional information and consider whether to include hazardous substances and litter as potential topics for widening of the scope of the Recommendation as proposed in the additional information.

2.7 The Meeting took note of the clarification that to avoid overlap, actions are not repeated in different segments although they might be contributing also to objectives in other segments.

2.8 The Meeting took note of the proposal by Sweden that since the action EN18 targets nutrients, hazardous substances and litter, it could be included in the Horizontal actions segment and invited the HODs to consider this proposal.

2.9 The Meeting discussed the additional information for action EE21 and recalled that it is an existing action stemming from the Ministerial Declaration 2010 and that the action has not been implemented by all countries which is why it is still proposed to be included in the updated BSAP.

2.10 The Meeting took note that Germany has made calculations on the potential reduction of P input resulting from eliminating P from detergents for industrial and institutional use and that Germany will look into the possibility to provide this information to be included as potential effect for action EE23.

2.11 The Meeting took note that regarding action HLN06 Sweden prefers developing an action plan on hazardous substances rather than a strategic approach.

2.12 The Meeting took note of the view by Sweden that for the action HLE05 the expression "as detailed as possible" should be replaced by either "sufficiently detailed" or "adequately detailed". The Meeting recalled that the formulation of the actions is currently a subject for consideration and approval by HOD 60-2021.

2.13 The Meeting took note of the view by Sweden that action HLN05 is overlapping with other actions and that it could be reported jointly with other actions. The Meeting took note that the possibility of such joint reporting is reflected in additional information for respective actions.

2.14 The Meeting pointed out that there should be an editorial review for the actions to ensure that the terminology used in the actions regarding contaminants of emerging concern is consistent, e.g. action HLE16.

2.15 The Meeting agreed that the term "shooting bullets" in action HLN01 is not linguistically appropriate and proposed that it should be replaced by "ammunition".

2.16 The Meeting agreed that piling and explosions as major sources of impulsive noise are missing from the activities list and proposed to include these additional activities to the list.

2.17 The Meeting agreed that action SE24a/SN26a overlaps with action SN29 and proposed merging these two actions.

2.18 The Meeting took note that Sweden proposes to rephrase action EN20 as "Specify criteria for designating new hot spots, and identify the 100 most important pollution sources having a negative impact on the Baltic Sea marine ecosystem. Using the criteria, implement measures to eliminate these new hotspots by 2030".

2.19 The Meeting agreed on the additional information to be submitted to HOD 60-2021 as contained **in Annex 2**, noting that the information for the two actions still coloured yellow (SN41 and EN20) is provisional and revised, if the formulation of the actions is substantially altered.

2.20 The Meeting thanked all the parties that contributed to collecting the additional information.

2.21 The Meeting took note that due to the limited time for national coordination Finland places a study reservation on the document.

2.22 The Meeting took note that the guidance regarding finalisation of the additional information will be given by HOD 60-2021 after the consideration of the achieved progress.

2.23 The Meeting took note that HOD 60-2021 will agree on the target years for the actions.

Agenda Item 3 Any other business

3.1 The Meeting did not consider any other business.

Agenda Item 4 Outcome of the Meeting

4.1 The draft outcome was prepared by the Secretariat and adopted via correspondence.

Annex 1 List of participants

Representing	Name	Organisation	Email address
Chair			
Chair	Lars Sonesten	Swedish University of Agricultural Sciences	Lars.Sonesten@slu.se
Contracting Parties			
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HELCOM Observers			
BFFE	Kjell Ivarsson	Federation of Swedish Farmers	kjell.ivarsson@lrf.se
HELCOM Secretariat			
HELCOM Secretariat	Dmitry Frank Kamenetsky	HELCOM Secretariat	Dmitry.Frank-Kamenetsky@helcom.fi
HELCOM Secretariat	Susanna Kaasinen	HELCOM Secretariat	susanna.kaasinen@helcom.fi

Annex 2 Additional information on BSAP actions related to the Pressure WG

Table 1. Draft supplementary information to be provided for the actions relevant for Pressure WG in the eutrophication segment

Code	Action	Type of action	Rationale	Potential effect (if available)	Implemented by	Overseeing WG/ EG	Indicator for achievement	Activities	Pressures
Theme: Follow-up of the implementation of nutrient reduction requirements									
EE12	An account listing, as detailed as possible, planned and implemented measures in different sectors and catchments alongside an estimation of their effectiveness will be submitted to HELCOM by 2023 in order to demonstrate whether National Net Nutrient Input Ceilings can be achieved with these measures.	supporting action	Better information on measures and their cost-effectiveness will allow improvements in ~~coordinated~~ coordination to achieve BSAP targets in terms of input of nutrients. For the EU member states the account list should include relevant measures from WFD, MSFD and other EU policies as well as global treaties for all CPs. The list will be used in an analysis of effectiveness of measures and contribute to the related work of PLC-8 project. The analysis will guide CPs to what further measures are necessary to achieve the BSAP nutrient input targets.		National/ joint	PRESSURE	Lists of measures and available knowledge on costs and effects submitted by each CP. PLC-8 thematic report on effectiveness of measures is published. ~~The list will be used in an analysis of effectiveness of measures.~~	Agriculture; Aquaculture – land,and marine;; Extraction of minerals; Forestry; Transport – air; Other ;Transport – land; Transport – shipping: Urban uses (land use); Wastewater (urban, industrial, scattered dwellings, stormwaters);	Input of nitrogen — diffuse sources, point sources, atmospheric deposition; Input of phosphorous — diffuse sources, point sources.
EE13	Assess progress towards Maximum Allowable Inputs annually and National Input Ceilings every second year, to follow up implementation of regional and national	Supporting action	BSAP nutrient reduction scheme includes Maximum Allowable inputs (MAI) per sub-basin and the corresponding Nutrient		joint	PRESSURE	Publication of Annual Core indicator on progress toward MAI including assessment data; Publication of ~~bi-annual~~ Policy message on progress	Agriculture; Aquaculture – land,and marine;; Extraction of minerals;	Input of nitrogen — diffuse sources, point sources, atmospheric deposition;

Code	Action	Type of action	Rationale	Potential effect (if available)	Implemented by	Overseeing WG/ EG	Indicator for achievement	Activities	Pressures
	targets for inputs of nutrients.		input ceiling for Countries/sources to fulfil in order to achieve the goal of a Baltic Sea unaffected by eutrophication. Regular follow up on whether nutrient inputs will be reduced in time to fulfil MAI and NIC by the agreed deadlines. Information on nutrient losses from individual catchments can be also used for analysis of river basin management plans.				towards NIC including technical annexes and assessment data every second year.~~;~~ ~~HELCOM PLC project securing co-funding assessment work~~	Forestry; Transport – air; Other ;Transport – land; Transport – shipping: Urban uses (kand use); Wastewater (urban, industrial, scattered dwellings, stormwaters); Activities and sources outside the Baltic Sea Region	Input of phosphorous — diffuse sources, point sources.
EE14	Provide timely sufficient and consistent data on nutrient loads to the Baltic Sea, ensuring reliability of the follow-up system, by maintaining and enhancing monitoring programmes and networks striving for harmonized methods to estimate nutrient inputs, including from unmonitored areas.	Supporting action	Timely delivered datasets ~~with~~ on annual inputs of~~n~~ nutrients ~~is~~ are a prerequisite for timely assessments of progress towards MAI and NIC. Updated PLC guidelines shall ensure monitoring programmes and quantification of inputs from unmonitored areas provide consistent, comparable data on nutrient inputs to the Baltic Sea covering the entire catchment area, and standardised assessment methodology.		national/ joint	PRESSURE	Annual update of PLC database. Annual BSEFS~~P~~ on waterborne nutrient inputs and annual BSEFS on atmospheric nitrogen inputs.	Agriculture; Aquaculture – land,and marine; Extraction of minerals; Forestry; Transport – air; Other; Transport – land; Transport – shipping: Urban uses (land use); Wastewater (urban, industrial, scattered dwellings, stormwaters)	Input of nitrogen — diffuse sources, point sources, atmospheric deposition; Input of phosphorous — diffuse sources, point sources.

Code	Action	Type of action	Rationale	Potential effect (if available)	Implemented by	Overseeing WG/ EG	Indicator for achievement	Activities	Pressures
EE09	Strengthen cooperation with river basin management authorities of non-HELCOM countries through official agreements addressing transboundary waterborne nutrient inputs from non-Contracting Parties	measure	Transboundary waterbourne nutrient inputs constitute a substantial part of the nutrient inputs to the Baltic Sea and need to be addressed to reach the HELCOM nutrient input reduction targets.	5561 tons of waterborne nitrogen and 930 tons of waterborne phosphorus since the reference period (1997-2003) assuming that non-Contracting Parties take the same responsibility to reduce nutrients input as the Contracting Parties	National/ Joint	PRESSURE	Agreements addressing transboundary waterborne nutrient inputs from non-Contracting Parties are adopted/common workshops/expert meetings are arranged/all levels of river management are included in this cooperation	Agriculture; Aquaculture – land; Waste waters (urban, industrial, scattered dwellings, stormwaters); Non-renewable energy generation (fossil fuel and nuclear powerplants); Industrial uses (oil, gas, industrial plants); Forestry; Transport – land (cars and trucks, trains), including infrastructure	Input of nitrogen — diffuse sources, point sources, atmospheric deposition; Input of phosphorous — diffuse sources, point sources.
Theme: Atmospheric nitrogen emissions									
EE15	HELCOM Contracting Parties will continue to reduce the deposition of atmospheric nitrogen on the Baltic Sea through the implementation of the national nitrogen reduction commitments of the Gothenburg Protocol and the EU NEC-Directive 2016/2284 for those HELCOM CPs that are also EU Member States. HELCOM CPs will ensure that measures taken in	measure	Airborne deposition contributes almost a third part of the total nitrogen input to the Baltic Sea	52758 tons of airborne nitrogen since the reference period (1997-2003) assuming full implementation of the Gothenburg Protocol of the UNECE Convention on Long-range Transboundary Air Pollution and National Emissions Ceilings (NEC) Directive	National	PRESSURE	Reduction commitments of the Gothenburg Protocol and the EU NEC-Directive 2016/2284 are achieved as a minimum requirement. Demonstrate that measures to reduce nitrogen emissions are tailored to contribute to the reduction of the nitrogen deposition on the Baltic Sea. .	Agriculture; Non-renewable energy generation (fossil fuel and nuclear powerplants); Transport – land (cars and trucks, trains), including infrastructure	Input of nitrogen— diffuse sources, point sources, atmospheric deposition

Code	Action	Type of action	Rationale	Potential effect (if available)	Implemented by	Overseeing WG/ EG	Indicator for achievement	Activities	Pressures
	transportation, combustion and agriculture are tailored to contribute to the reduction of the nitrogen deposition on the Baltic Sea.								
EE17	Enhance HELCOM cooperation with the UNECE Convention for Long-Range Transboundary Air Pollution in order to promote the inclusion of the protection of the Baltic Sea ecosystem as an additional criterion in the process of the revision of the emission targets for nitrogen in the Gothenburg Protocol.	supporting action	The Gothenburg Protocol is a tool to reduce nitrogen emissions. Considering protection of the Baltic Sea Marine ecosystem in the revision of the reduction targets for nitrogen emissions facilitates achieving of the maximum allowable input of nitrogen to the Baltic Sea. Higher reduction of airborne nitrogen input to the Baltic Sea could be achieved, if the contracting parties to the Gothenburg Protocol would strengthen national commitments to reduce nitrogen emissions.	~~Higher reduction of airborne nitrogen input to the Baltic Sea could be achieved, if the contracting parties to the Gothenburg Protocol would strengthen national commitments to reduce nitrogen emissions.~~	Joint; national	PRESSURE	A memorandum of understanding as well as procedures to exchange technical expertise between HELCOM and UNECE CLRTAP have been set ~~involving OSPAR~~.	Agriculture; Non-renewable energy generation (fossil fuel and nuclear powerplants); Transport – land (cars and trucks, trains), including infrastructure	Input of nitrogen — diffuse sources, point sources, atmospheric deposition
Theme: Waste-water sector									
EN18	Strengthen the HELCOM Recommendation 28E/5 on MUNICIPAL WASTEWATER TREATMENT [by 2027]	Measure	There has been significant improvement in the waste-water treatment technology since the adoption of the Recommendation 28E/5. New technologies, which are already in use in some countries, allow for	Tightening the requirements for nutrient removal from waste water ~~would~~ will further reduce nutrient inputs from waste-water treatment plants. It will also serve to minimize releases of hazardous substances and ~~microparticles~~microlitter.	Joint	PRESSURE	Revised or new Recommendation with stricter requirements for nutrient and, potentially, hazardous substances and microlitter removal from waste-water is adopted.	Waste waters (urban, industrial, scattered dwellings, stormwaters)	Input of nitrogen — diffuse sources, point sources, atmospheric deposition; Input of phosphorous — diffuse sources, point sources.

Code	Action	Type of action	Rationale	Potential effect (if available)	Implemented by	Overseeing WG/ EG	Indicator for achievement	Activities	Pressures
			higher nutrient removal rates that are required by the current Recommendation and more efficient removal of hazardous substances and microplastic.						Input of litter (solid waste matter, including micro-sized litter) Input of heavy metals Input of anthropogenic impulsive noise Input of litter (solid waste matter, including micro-sized litter) Input of microbial pathogens Input of nitrogen — diffuse sources, point sources, atmospheric deposition Input of organic matter — diffuse sources and point sources Input of other forms of energy (including electromagnetic fields, light and heat) Input of other substances (e.g. synthetic substances, non-synthetic substances, radionuclides) — diffuse sources, point sources, atmospheric

Code	Action	Type of action	Rationale	Potential effect (if available)	Implemented by	Overseeing WG/ EG	Indicator for achievement	Activities	Pressures
									deposition, acute events Input of PBDEs Input of PCBs Input of PFAS
EE18	Facilitate exchange of information on best available treatment techniques (WWTP) through cooperation with existing regional digital platform(s) acting as a hub for the best knowledge in the wastewater management sector	Supporting action	There is a large number of various wastewater treatment technologies which increase wastewater treatment efficiency. Exchange of information on these technics and available practices allows for tailoring the most efficient and economically feasible solutions for various types of sewerage systems.		Joint	PRESSURE	A regional digital platform acting as a hub for the best knowledge in the wastewater management sector established and actively used in the BS region.	Waste waters (urban, industrial, scattered dwellings, stormwaters);	Input of nitrogen — diffuse sources, point sources, atmospheric deposition; Input of phosphorous — diffuse sources, point sources,
EE19	Encourage educational cooperation with involvement of relevant non-governmental organizations utilizing such regional digital platform(s) to solve problems of municipal sewage in smaller municipalities and scattered settlements	Supporting action	Scattered dwellings and individual houses which do not have proper sewerage systems are significant sources of nutrient load on the Baltic Sea which needs to be addressed. Raising of awareness and exchange knowledge on the available solutions enhance their application in this sector. In this relation, the role of non-governmental organizations is very high.		National/ joint	PRESSURE	Full implementation of the HELCOM Recommendation on 28/E6 is achieved.	Waste waters (urban, industrial, scattered dwellings, stormwaters);	Input of nitrogen — diffuse sources, point sources., atmospheric deposition; Input of phosphorous — diffuse sources, point sources.

Code	Action	Type of action	Rationale	Potential effect (if available)	Implemented by	Overseeing WG/ EG	Indicator for achievement	Activities	Pressures
EE20	Cooperate with relevant PAs of the EU SBSR regarding e.g. wastewater treatment plants (under "save the sea" objective of the EUSBSR) as well as other regional policies to engage a wider network of stakeholders into cooperation to achieve the BSAP targets.	supporting action	Policy Areas Nutri and Bioeconomy are intended to promote measures and practices to enhance effectiveness of nutrients management and thus contribute to the achievement of the BSAP goals. PAs support regional projects and processes facilitating transfer of respective knowledge and involving broad stakeholder~~s~~ community in the implementation of HELCOM regional policy.		Joint	PRESSURE	HELCOM ~~P~~participation in the PAs steering committees. Participation of PAs coordinators in HELCOM meetings and ~~C~~consideration of outcomes of projects and processes supported by PAs at relevant HELCOM WG meetings.	Agriculture; Aquaculture – land; Waste waters (urban, industrial, scattered dwellings, stormwaters); Non-renewable energy generation (fossil fuel and nuclear powerplants); Industrial uses (oil, gas, industrial plants); Forestry; Transport – land (cars and trucks, trains), including infrastructure	Input of nitrogen — diffuse sources, point sources., atmospheric deposition; Input of phosphorous — diffuse sources, point sources.
EE21	Target the elimination of phosphorus in laundry detergents for consumer use as soon as possible, but not later than by [2024]	measure	The use of phosphorus free detergents contributes to overall reduction of P load on the aquatic environment. The elimination of P in laundry detergents for consumer use means the introduction of a maximum limit for total phosphorus content with a hurdle of 0.2% to 0.5% of phosphorus by weight (as in HELCOM	Reduction of P input to the Baltic Sea	national	PRESSURE	All countries introduced ~~technical~~ regulations for P free laundry detergents for consumer use	Waste waters (urban, industrial, scattered dwellings, stormwaters);	Input of phosphorous — diffuse sources, point sources.

Code	Action	Type of action	Rationale	Potential effect (if available)	Implemented by	Overseeing WG/ EG	Indicator for achievement	Activities	Pressures
			Recommendation 28E /7).						
EE22	Build knowledge base to target the reduction of phosphorus in detergents for industrial & institutional use. By 2025, develop and publish a HELCOM progress report about best available techniques, alternative builder, especially on their use, environmental effects and effectiveness.	Supporting action	While action has been taken in both HELCOM and EU level on phasing out P in laundry detergents for consumer use, further efforts are needed to reduce P in detergents for industrial use. Further information is needed on best available techniques, alternative builder, especially on their use, environmental effects and effectiveness for these detergents.		Joint	PRESSURE	HELCOM report on best available techniques, alternative builder, especially on their use, environmental effects and effectiveness to target the reduction of phosphorus in detergents for industrial & institutional use	Waste waters (urban, industrial, scattered dwellings, stormwaters);	~~Input of nitrogen — diffuse sources, point sources, atmospheric deposition;~~ Input of phosphorous — diffuse sources, point sources.
EE23	Undertake efforts to reduce and where possible eliminate phosphorus in detergents for industrial & institutional use, in particular for institutional use of laundry and dishwater detergents [no later than by 2030] based on the knowledge on best available techniques compiled at the first step	measure	The use of phosphorus free detergents for industrial and institutional use contributes to the overall reduction of P load ~~on~~ to the aquatic environment.	reduction of P input to the Baltic Sea [Germany might propose an estimation of expected reduction]	national. regional	PRESSURE	New HELCOM Recommendation based on outcomes of action EE22. All countries introduced ~~technical~~ regulations, in line with the HELCOM Recommendation, for P free laundry detergents for industrial and institutional use.~~consumer use~~	Waste waters (urban, industrial, scattered dwellings, stormwaters);	Input of phosphorous — diffuse sources, point sources.

Table 2. Draft supplementary information for the actions relevant for Pressure WG the in the hazardous substances and litter segment

Code	Action	Type of action	Rationale	Potential effect (if available)	Implemented by	Overseeing WG/ EG	Indicator for achievement	Activities	Pressures
	Theme: Hazardous substances								
HLN06	Develop a [regional strategic approach] [regional action plan] to HELCOM work on hazardous substances by [2024]	Supporting action	The current HELCOM framework for hazardous substances is mainly based on a limited number of priority contaminants and a list of measures to prevent their input to the marine environment compiled on an ad hoc basis. ~~The framework requires modification based on holistic approach to the problem of contamination of the marine environment by hazardous substances.~~ A framework based on a holistic and coordinated approach to the problem of contamination of the marine environment by hazardous substances ~~is much preferred~~will be applied. The regional policy document on hazardous		Joint	PRESSURE	Regional strategic approach/action plan on hazardous substances is adopted.	Waste waters (urban, industrial, scattered dwellings, stormwaters); Industrial uses (oil, gas, industrial plants); Agriculture Aquaculture – land; Aquaculture – marine, including infrastructure; Non-renewable energy generation (fossil fuel and nuclear powerplants); Solid waste (e.g. land-based disposal of dredged material, land-fill, solid waste streams); Transport – land (cars and trucks, trains), including infrastructure Transport – shipping (incl. anchoring, mooring) Transport infrastructure (harbours, ports, ship-building) Activities and sources outside the Baltic Sea Region	Input of pharmaceuticals; Input of dioxins; Input of heavy metals; Input of other substances (e.g. synthetic substances, non-synthetic substances, radionuclides) — diffuse sources, point sources, atmospheric deposition, acute events; Input of PBDEs; Input of PCBs; Input of PFAS; Input of TBT

Code	Action	Type of action	Rationale	Potential effect (if available)	Implemented by	Overseeing WG/ EG	Indicator for achievement	Activities	Pressures
			substances will be used as a background for this work.						
HLE04	Develop national programmes with a particular focus on hazardous substances which are not adequately regulated by other policies	Supporting action	National programmes may be necessary for hazardous substances identified as relevant within the HELCOM work on hazardous substances if not regulated by other policies. National programmes will contain necessary actions to lower the input of hazardous substances of regional concern.		National	PRESSURE	National implementation plans for regionally relevant substances are developed where needed.	All activities relevant for the release of HS (see the list for action HLN06)	All pressures relevant for the release of HS (see the list for action HLN06)
HLE05	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.	Supporting action	Better information on measures and their cost-effectiveness will allow improvements in coordinated work on hazardous substances. For the EU member states the account list should include relevant measures from WFD, MSFD and other EU policies as well as global treaties for all CPs. The list will be used in an analysis		National/ joint	PRESSURE	Lists of measures and available knowledge on costs and effects is ~~submitted~~reported to HELCOM. ~~The list will be used in an analysis of effectiveness of measures.~~ An analysis of the reported information is published by HELCOM.	All activities relevant for the release of HS (see the list for action HLN06)	All pressures relevant for the release of HS (see the list for action HLN06)

Code	Action	Type of action	Rationale	Potential effect (if available)	Implemented by	Overseeing WG/ EG	Indicator for achievement	Activities	Pressures
			of effectiveness of measures.						
HLN04	Strengthen and update HELCOM recommendations for industrial releases of hazardous substances by applying information produced under the EU Industrial Emissions Directive and other sources in order to sufficiently protect the Baltic Sea environment	Supporting action	Important information and recommendations produced in other fora such as the IED and E-PRTR frameworks could be used to improve knowledge and potentially limit industrial release of hazardous substances further when necessary. The action is intended to complement but not duplicate the EU regulation as well as influence related EU regulation with respect to HS of regional concern for the BS.		Joint	PRESSURE	Industrial release data from e.g. E-PRTR and IED is utilized in the holistic assessment of the Baltic Sea to complement the PLC and indicator reports. ~~Identification of g~~Identify gaps and Baltic Sea specific requirements which can be addressed in HELCOM recommendations for industrial releases of hazardous substances. Required regulations are adopted as new or updated HELCOM Recommendations. ~~adopted~~	All activities relevant for the release of HS (see the list for action HLN06)	All pressures relevant for the release of HS (see the list for action HLN06)
HLN05	Decrease the emissions of hazardous substances from small scale emitters in urban areas (municipal entities, businesses and private households) by chemical-smart purchasing strategies, substitution and awareness raising campaigns	Measure	Large number of chemicals are used in small scale businesses which are connected to MWWTPs. These chemicals are often not removed from wastewater and contaminate sewage sludges when precipitated. The action is aimed at reduction of input of contaminants at	Significant reduction of releases of pollutants of high concern can be achieved at sources.	National/ Joint	PRESSURE	Regional guideline on best practices for smart chemical management for small-scale emitters e.g. municipal entities, businesses and private households is published. ~~Chemical Action Plans to reduce HS, chemical-smart Green Procurement Criteria and model awareness-~~	Waste waters (urban, industrial, scattered dwellings, stormwaters)	Input of heavy metals; Input of other substances (e.g. synthetic substances, non-synthetic substances, radionuclides) — diffuse sources, point sources, atmospheric deposition, acute events; Input of PFAS;

Code	Action	Type of action	Rationale	Potential effect (if available)	Implemented by	Overseeing WG/ EG	Indicator for achievement	Activities	Pressures
			sources through reduction of the use of the chemicals of high concern and responsible their handling by small businesses.				~~raising campaigns & information materials.~~ Awareness-raising campaigns & information materials on chemical-smart strategies for preventing releases of hazardous substances is communicated with residents and businesses. If feasible, ~~A~~ arrange a study illustrating awareness raising among citizens before and after campaigns to prove their effectiveness.		
HLE12	Establish a chemical product registers to be built upon e.g. the EU REACH (EC1907/2006) framework [by 2025]	Supporting action	Chemical product registers can provide statistics on the use of chemicals, which can complement other information needed for development of efficient measures.		National	PRESSURE	National product registers in place.	All activities relevant for the release of HS (see the list for action HLN06)	All pressures relevant for the release of HS (see the list for action HLN06)
HLE14/ HLE13	Launch educational and information campaigns [by 2025] to raise public awareness regarding responsible handling of hazardous substances in household chemicals and articles to prevent their release into the environment.	Measure	Large number of chemicals are used by population in households. Responsible handling of household chemicals includes voluntary	Significant reduction of releases of pollutants of high concern can be achieved at sources.	National/ joint	PRESSURE	Regional guidelines/ recommendations for general public and visual outreach material encouraging environmentally responsible selection of products and handling of chemicals in	Waste waters (urban, industrial, scattered dwellings, stormwaters)	Input of heavy metals; Input of other substances (e.g. synthetic substances, non-synthetic substances, radionuclides) —

Code	Action	Type of action	Rationale	Potential effect (if available)	Implemented by	Overseeing WG/ EG	Indicator for achievement	Activities	Pressures
			minimization of the use of chemicals containing compounds of high environmental concern together with responsible utilization of unused chemicals in accordance with existing best environmental practices. The action is partly overlapping with HLN05 and HLN12.				households are published. ~~, n~~ National ~~and~~ or local guidelines/ recommendations for general public and visual outreach material encouraging environmentally responsible selection of products and handling of chemicals in households are issued, if needed. National education and outreach campaigns are arranged based on the guidelines/ recommendations. Reporting can be partly done jointly with action HLN05 and HLN12.		diffuse sources, point sources, atmospheric deposition, acute events; Input of PFAS;
HLE15	Introduce requirements regarding content of chemicals of high regional environmental concern in public procurement procedures [by 2025] and provide support for follow up.	measure	Introduction of environmental requirements in the public procurement procedures can reduce releases of hazardous substances of high concern. Target group for this action is authorities responsible for organization of procurement procedures.	Significant reduction of releases of pollutants of high concern can be achieved at sources.	National/ joint	PRESSURE	Regional guidelines/ recommendations for green procurement procedures are published. ~~, n~~ National ~~and~~ or local guidelines/ recommendations for green procurement procedures are issued, if needed. Reporting can be partly done jointly with action HLN05.	Waste waters (urban, industrial, scattered dwellings, stormwaters); Solid waste (e.g. land-based disposal of dredged material, land-fill, solid waste streams); Transport – land (cars and trucks, trains), including infrastructure	Input of heavy metals; Input of other substances (e.g. synthetic substances, non-synthetic substances, radionuclides) — diffuse sources, point sources, atmospheric deposition, acute events; Input of PFAS;

Code	Action	Type of action	Rationale	Potential effect (if available)	Implemented by	Overseeing WG/ EG	Indicator for achievement	Activities	Pressures
			The action is partly overlapping with HLN05.						
HLE16	Establish procedures [by 2025] to utilize information obtained under various policies addressing the use of chemicals (e.g. REACH, WFD, IED, Stockholm Convention etc) to prioritize measures targeting regional contaminants and to identify emerging pollutants of high concern.	Supporting action	Coordinated procedures are needed to make work related to hazardous substances as efficient as possible. This action is part of the implementation of HLN06. The action is linked also with action HLE04.		Joint	PRESSURE	Analysis of measures implemented under other policies, including their effectiveness. Information on identified measures presented at appropriate fora for their regional prioritisation. Summary on international work on contaminants of emerging concern, e.g screening campaigns, presented every two years at PRESSURE and other relevant HELCOM bodies.	All activities relevant for the release of HS (see the list for action HLN06)	All pressures relevant for the release of HS (see the list for action HLN06)
HLE18	Establish a mechanism for HELCOM to manage the list of priority substances [starting from 2025] and respond to screening and assessment results pointing out regional challenges for the Baltic Sea environment and contaminants of emerging concern	Supporting action	A structured approach is needed to manage the list of priority substances as an ad hoc substance by substance approach is too inefficient in order to function adequately. This action is part of the implementation of action HLN06.		Joint	PRESSURE	Formally established group working in collaboration with relevant other actors (e.g. global treaties, OSPAR, EU NORMAN network) aiming to further risk-based prioritisation tools for the needs of RSCs. A prioritisation mechanism in place, which is used for continuous update of the priority list based	All activities relevant for the release of HS (see the list for action HLN06)	All pressures relevant for the release of HS (see the list for action HLN06)

Code	Action	Type of action	Rationale	Potential effect (if available)	Implemented by	Overseeing WG/ EG	Indicator for achievement	Activities	Pressures
							on reported data and prioritisation criteria.		
HLE19	Organize continuous follow up of the work on hazardous substances under various global and EU policies as well as in RSCs [starting from 2024], and actively influence these processes by promoting international actions identified as necessary to improve the environmental status with respect to hazardous substances in the Baltic Sea.	Supporting action	Efficient work on hazardous substances demands ~~i~~improved cooperation with respective processes in other international fora to ~~fora~~ actively influence these processes including promotion of international actions beyond the HELCOM area. ~~is needed for efficient work.~~ This action is part of the implementation of action HLN06.		Joint	PRESSURE	Summary on international work on hazardous substances presented yearly at PRESSURE and other relevant HELCOM bodies. Joint HELCOM initiatives are proposed to relevant global or upstream Conventions to reduce inputs of HAZ to the HELCOM Convention area.	All activities relevant for the release of HS (see the list for action HLN06)	All pressures relevant for the release of HS (see the list for action HLN06)
HLE20	HELCOM participation [starting from 2023] as member in Strategic Approach on [International Chemicals Management High Ambition Alliance (SAICM HAA)] to support international cooperation on global chemical challenges that influence the state of the Baltic Sea. Identification of global challenges that are of importance for the Baltic Sea that HELCOM will put on the [SAICM HAA] agenda.	Supporting action	Improved cooperation with respective processes in other international fora is needed for efficient work.		Joint	PRESSURE	Membership in SAICM HAA.	All activities relevant for the release of HS (see the list for action HLN06)	All pressures relevant for the release of HS (see the list for action HLN06)
Provisional topic: Legacy pollutants									
HLN01	Encourage the use of alternative less toxic metals and other materials to replace	measure	Large areas of the Baltic sea remain in bad status in terms	Reduction of lead input to the aquatic	National/ Joint	PRESSURE; FISH	~~National and regional~~ Regional guidelines and recommendations on	Fish and shellfish harvesting (bottom-touching towed	Input of lead

Code	Action	Type of action	Rationale	Potential effect (if available)	Implemented by	Overseeing WG/ EG	Indicator for achievement	Activities	Pressures
	lead in fishing gear and [shooting] bullets with the aim to minimize harmful use of metallic lead.		of lead. Loss of fishing equipment to the Baltic Sea as well as spreading of lead ~~as~~from ~~shooting bullets~~ammunition is a direct emission source, which causes unacceptable effects on the marine life. Input of lead must be stopped on a regional scale. This concerns both professional and recreational activities. Alternatives are already available on the market.	environment in the BS region.			substitution of lead in fishing gear and ammunition~~shooting bullets~~ are adopted. National guidelines and recommendations on substitution of lead in fishing gear and ammunition are issued. Related regional and national outreach campaigns are arranged.	gears, professional, recreational) Fish and shellfish harvesting (pelagic towed gears, stationary gears, professional, recreational) Hunting and population control Tourism and leisure activities (boating, beach use, water sports, etc.)	
HLE02	In order to decrease dioxin emissions, perform information campaigns and other instruments that focus on the quality and species of [the] firewood, and what is burned in the small-scale combustion appliances [by 2025]	measure	Dioxin is one of the most toxic organic compounds generated by low temperature combustion. Small scale combustion appliances are broadly used in many countries and are significant source of dioxins in case of using chlorine containing fuels due to low temperature of combustion process.	Reduction of dioxin emissions.	national~~/ joint~~	PRESSURE	National ~~guiding~~ information material~~s~~ to minimise dioxin emissions from ~~for the use of dioxin free~~ small scale combustion appliances are published where relevant.	Non-renewable energy generation (fossil fuel and nuclear powerplants)	Input of dioxins

Code	Action	Type of action	Rationale	Potential effect (if available)	Implemented by	Overseeing WG/ EG	Indicator for achievement	Activities	Pressures
HLE07/ HLE06	Enhance implementation of the UNEP 2013 Minamata Convention on Mercury by those Contracting Parties that are parties to this Convention and encourage its ratification by HELCOM countries that are not yet parties to the Convention	supporting action	Baltic Sea remains in not good status in terms of mercury contamination. Minamata Convention is one of the key global tools tailored to cease the use of mercury and its subsequent release to the environment. Not all HELCOM countries have ratified the Convention. Early ratification of the Convention by all HELCOM countries together with Implementation of its requirements is the way to mercury free BS region.	~~Reduction of input of mercury.~~	national	PRESSURE	Minamata Convention is ratified by all countries. Provisions of Minamata convention are transposed to national legislation.	Activities and sources outside the Baltic Sea Region Industrial uses (oil, gas, industrial plants) Non-renewable energy generation (fossil fuel and nuclear powerplants) Restructuring of seabed morphology (dredging, beach replenishment, sea-based deposit of dredged material) Solid waste (e.g. land-based disposal of dredged material, land-fill, solid waste streams) Waste waters (urban, industrial, scattered dwellings, stormwaters)	Input of mercury
HLE08	Undertake all possible measures to reduce mercury emissions from energy sector [by 2025]	measure	Two major sources of global mercury emissions are ~~A~~artisan gold recovery using mercury, and solid fossil fuel combustion. ~~are two major sources of global mercury emissions~~. Since there is no such kind of gold recovery in the BS region combustion of solid	Reduction of mercury deposition on the Baltic Sea	national	PRESSURE	~~Proven zero~~ National reports demonstrate further reducing of mercury emissions from energy sector.	Non-renewable energy generation (fossil fuel and nuclear powerplants)	Input of mercury

Code	Action	Type of action	Rationale	Potential effect (if available)	Implemented by	Overseeing WG/ EG	Indicator for achievement	Activities	Pressures
			fossil fuels remains one of the main sources of mercury emissions.						
HLE09	Control concentration of mercury in dredged material and undertake possible measures to prevent its release during dredging operations and handling of dredged material	measure	Mercury remains in the Baltic Sea ecosystem buried in sediments. Dredging and depositing operations at sea might resuspend fine grained sediments contaminated by mercury in the water column. This causes reintroduction of mercury to food chains.	Prevention of reintroduction of mercury to trophic chains in the BS marine ecosystem.	National/ Join	PRESSURE	National requirements to monitor mercury in dredged sediments including using regionally harmonized limit values for mercury concentration in marine sediments in respective environmental permits.	Restructuring of seabed morphology (dredging, beach replenishment, sea-based deposit of dredged material) Solid waste (e.g. land-based disposal of dredged material, land-fill, solid waste streams)	Input of mercury
HLE10	Introduce the ban of the use of mercury-based amalgam in dentistry by [2030], except when deemed strictly necessary	measure	Dentistry is one of the sectors where mercury is still used. The use of it can't be ceased ~~immediately~~ completely at present due to ~~some medical reasons and~~ absence of alternative solutions for some medical conditions. ~~But this should be done in the upcoming decade.~~	Reduction of input of mercury.	National	PRESSURE	The ban of the use of mercury-based amalgam in dentistry is legal requirement in all BS countries.	Solid waste (e.g. land-based disposal of dredged material, land-fill, solid waste streams) Waste waters (urban, industrial, scattered dwellings, stormwaters)	Input of mercury
HLE11	Establish [2023] and maintain procedures (rules) to handle mercury containing wastes to prevent entering of the contaminant to the	measure	Despite massive process of substituting mercury in goods and products, some of	Reduction of input of mercury.	National	PRESSURE	Legal requirements for handling mercury containing wastes~~,~~ ~~I~~, including respective public information.	Solid waste (e.g. land-based disposal of dredged material, land-fill, solid waste streams)	Input of mercury

Code	Action	Type of action	Rationale	Potential effect (if available)	Implemented by	Overseeing WG/ EG	Indicator for achievement	Activities	Pressures
	environment, including public information on the procedures (rules)		them still contain this ~~toxic~~ metal. Utilization of mercury containing wastes in a way which prevents release of mercury to the environment should be mandatory in all Baltic Sa countries.						
HLE17	Introduce [by 2027] measures based on the best available scientific knowledge and technologies to restrict the use and prevent releases of perfluorinated alkyl substances, phenolic compounds with endocrine disrupting effects and chlorinated paraffins	measure	Listed substances are included in the HELCOM priority list. They are proven to have toxic environmental effect. Scarcity of data on the presence of these substances in the marine environment and on their input to the Baltic Sea delays an agreement on measures targeting these substances. Improvement of knowledge base should enable the development of such measures.	reduction of input of listed hazardous substances to the aquatic environment	joint	PRESSURE	Regional report on the state of the Baltic Sea with regard to the listed groups of chemical compounds. Regional measures to prevent the release of these contaminants to the aquatic environment.	Industrial uses (oil, gas, industrial plants) Waste waters (urban, industrial, scattered dwellings, stormwaters)	Input of other substances (e.g. synthetic substances, non-synthetic substances, radionuclides) — diffuse sources, point sources, atmospheric deposition, acute events Input of PFAS
Provisional topic: Contaminants of emerging concern									
HLN09	Improve knowledge base on occurrence of pharmaceutical substances in the environment, their persistence and harmful effects and assure availability of this information for broad expert community [2025	Supporting action	Pharmaceuticals are an important group among contaminants of emerging concern for the Baltic Sea. Information about properties and		Joint	PRESSURE	Information for broad expert community about available information sources (e.g. Background document /internet platform/database that compiles available	Agriculture, Aquaculture – land, Aquaculture – marine, including infrastructure, Waste waters (urban, industrial,	Input of pharmaceuticals

Code	Action	Type of action	Rationale	Potential effect (if available)	Implemented by	Overseeing WG/ EG	Indicator for achievement	Activities	Pressures
			findings in the marine environment are available but often on a scattered and national basis. As information is the basis for further work to prevent releases of pharmaceuticals in the environment, it is a crucial step to improve knowledge to support measures, research and further actions.				information sources) is published.	scattered dwellings, stormwaters)	
HLE01/ HLN03	Identify priority pharmaceuticals [by 2024] utilising the best available knowledge on their releases into the aquatic environment, environmental effects and available data on the use in the region for efficient risk reduction and for subsequent integration of these substances to HELCOM assessments as indicators of the state of the Baltic sea and environmental pressure.	supporting action	To take into account regional conditions (e.g. uses, sales, prescriptions etc) as well as the special vulnerability of the Baltic Sea with regard to effects of hazardous substances is crucial to identify priority pharmaceuticals. The integration of these substances is important to assess the status and the effectivity of risk reduction measure. The action is linked with action HLE18 and HLN09.		Joint	PRESSURE	Priority pharmaceuticals for the Baltic Sea Region are identified. Information about effects, releases, uses and efficient risk reduction is compiled. Priority pharmaceuticals are utilized for the assessment of the BS state, including as indicators.	Agriculture, Aquaculture – land, Aquaculture – marine, including infrastructure, Waste waters (urban, industrial, scattered dwellings, stormwaters	Input of pharmaceuticals
HLN10	Develop guidance for the environmental monitoring and analysis of pharmaceuticals	Supporting action	Coordinated monitoring is central for the HELCOM		Joint	STATE & CONSERVATION; PRESSURE	Guidance for environmental	Agriculture, Aquaculture – land, Aquaculture –	Input of pharmaceuticals

Code	Action	Type of action	Rationale	Potential effect (if available)	Implemented by	Overseeing WG/ EG	Indicator for achievement	Activities	Pressures
	identified as indicators of the state of the Baltic Sea [by 2025]		assessment which is the basis for sound decisions to protect the Baltic Sea.				monitoring and analysis is published.	marine, including infrastructure, Waste waters (urban, industrial, scattered dwellings, stormwaters)	
HLN12	Information campaign on what not to flush [by 2025] (addressing chemicals, pharmaceuticals and litter).	Supporting action	Large amount of chemicals as well as substances containing microplastic are used in households. Information campaign is aimed to foster their handling in households to reduce the input at source. This action is linked with action HLN05.		National	PRESSURE	Information on "what not to flush" or alternatively "what to flush" is delivered to e.g. residents and water management companies. If feasible, to arrange a ~~A~~ study illustrating awareness raising among citizens before and after campaigns to prove their effectiveness.	Waste waters (urban, industrial, scattered dwellings, stormwaters)	Input of heavy metals; Input of pharmaceuticals; Input of PFAS; Input of litter (solid waste matter, including micro-sized litter)
HLN13	Strengthen the collection of unused pharmaceuticals from public in the Baltic Sea region [by 2026]	Measure	To avoid inputs of pharmaceuticals to the environment from unused pharmaceuticals which are not properly disposed of. The action also concerns pharmaceuticals purchased via internet.	Minimise the release of pharmaceutical in the environment.	National	PRESSURE	Collection system of unused pharmaceuticals is in place.	Agriculture, Aquaculture – land, Aquaculture – marine, including infrastructure, Waste waters (urban, industrial, scattered dwellings, stormwaters)	Input of pharmaceuticals
HLN02	In cooperation with health care institutions, increase awareness and knowledge of consumers about pharmaceuticals containing substances that are persistent and harmful for the	measure	A number of medical substances which are available in pharmacies without prescriptions have been found in the	minimisation of input of pharmaceuticals	national/ joint	PRESSURE	~~Scientific reports proving adverse effect of particular substances on the marine environment.~~	Waste waters (urban, industrial, scattered dwellings, stormwaters)	Input of pharmaceuticals

Code	Action	Type of action	Rationale	Potential effect (if available)	Implemented by	Overseeing WG/ EG	Indicator for achievement	Activities	Pressures
	environment, when scientifically justified information is available.		marine environment. Some of them, such as pain killers, are known due to their adverse effect on the ecosystem. Information campaigns targeting medical compounds with proven adverse effect should target overconsumption of these medical substances based on the best available scientific knowledge (actions HLE01/ HLN03). The information is aimed at enhancing prudent use and disposal of pharmaceuticals and the importance of, when possible, using pharmaceuticals that are not persistent and less harmful for the environment. Health care institutions to be involved are e.g. prescribers and pharmacies.				~~Information materials~~ A dialogue with medical product agencies, health care institutions to convey a scientifically justified advice to consumers ~~based on the available scientific knowledge informing~~ about ~~the danger to the environment~~ prudent use and disposal of pharmaceuticals and the importance of, when possible, using pharmaceuticals that are not persistent and less harmful for the environment.		
HLE03	Address substances of emerging concern by commencing recurrent screening campaigns [starting from 2021] including broad analytical techniques such as	Supporting action	To identify substances previously unknown in the Baltic marine environment but occurring in		~~Regional~~ Joint	PRESSURE	Implementation of the HELCOM hazardous substances screening project ~~Indicator~~	Agriculture, Aquaculture – land, Aquaculture – marine, including infrastructure, Waste waters	Input of pharmaceuticals; Input of other substances (e.g. synthetic substances, non-

Code	Action	Type of action	Rationale	Potential effect (if available)	Implemented by	Overseeing WG/ EG	Indicator for achievement	Activities	Pressures
	suspect screening and non-target screening methods.		elevated concentration. To follow up occurrence and trends of substances of emerging concern to identify substances of relevance for the Baltic Sea timely. The results of the screening campaigns can support European and international work on chemical regulation as findings in the marine environment are important indications about behaviour and properties of substances.					(urban, industrial, scattered dwellings, stormwaters) Munitions disposal	synthetic substances, radionuclides) — diffuse sources, point sources, atmospheric deposition, acute events; Input of PBDEs; Input of PFAS
HLN08	Limit the use of firefighting foam containing PFAS at sea and in the catchment area and promote sustainable alternatives [by 2027]	measure	PFAS are identified as toxic and very persistent synthetic organic compounds with high accumulation ability. They are used in fire foams application of which is one of the sources of direct input of these compounds to the aquatic environment.	reduction of input of PFAS	joint	PRESSURE, MARITIME	HELCOM Recommendation limiting the use of PFAS in firefighting foams at sea. HELCOM Recommendation limiting the use of PFAS in firefighting foams in catchment area. Regional report on sustainable fluorine free alternatives to	Other	Input of PFAS

Code	Action	Type of action	Rationale	Potential effect (if available)	Implemented by	Overseeing WG/ EG	Indicator for achievement	Activities	Pressures
							PFAS in firefighting foams. HELCOM proposal to IMO to limit the use of firefighting foam containing PFAS at ships. Communication with ECHA to facilitate the development of related restrictions at the EU level.		
HLN07/ HLN11	Minimise the release of biocides from antifouling products to the marine environment, and [by 2026] replace use of biocidal antifouling products with biocide free alternatives when available and environmentally and technically feasible.	~~Supporting action~~ measure	Biocides released from antifouling products can have adverse effects and can accumulate in the marine environment. Biocide free alternatives are available and their fields of application need to be promoted and their use should be strengthened.	reduction of releases of biocides from antifouling products.	joint	PRESSURE; MARITIME	~~HELCOM Roadmap?~~ HELCOM Recommendation on antifouling is adopted. HELCOM Roadmap towards biocide free antifouling in the Baltic Sea region.	Transport – shipping (incl. anchoring, mooring), Tourism and leisure activities (boating, beach use, water sports, etc.), Tourism and leisure infrastructure (piers, marinas), Aquaculture – marine, including infrastructure Waste waters (urban, industrial, scattered dwellings, stormwaters), Offshore structures (other than for oil/gas/renewables), Marine and coastal construction, Offshore structures (other than for oil/gas/renewables)	Input of other substances (e.g. synthetic substances, non-synthetic substances, radionuclides) — diffuse sources, point sources, atmospheric deposition, acute events

Table 3. Draft supplementary information for the actions relevant for Pressure WG the in the Sea-based activities segment

Code	Action	Type of action	Rationale	Potential effect (if available)	Implemented by	Overseeing WG/ EG	Indicator for achievement	Activities	Pressures
	Theme: Seabed loss and disturbance								
SN38/ SN40/ SN42	Regularly update and improve the HELCOM Recommendation and Guideline for handling dredged material at sea using the best available knowledge to minimize environmental impact of these activities further developing BAT and BEP for dredging and depositing operations.	supporting action	The Contracting Parties should, as far as possible, apply the Recommendation and Guideline in their authorisation or regulation procedures for dredged material. for handling dredged material at sea. This also provides requirements for reporting related data for regular HELCOM assessments and for LC/LP. Update of the Guideline based on the BAT and BEP helps to minimise environmental impact of these activities and improve data on their effect on marine ecosystem.		Joint	PRESSURE	HELCOM Recommendation and Guideline for handling dredged material at sea are improved and maintained ~~actual~~up-to-date. Development of BAT/BEP to minimize environmental impact of dredging/depositing operations.	Restructuring of seabed morphology (dredging, beach replenishment, sea-based deposit of dredged material) Solid waste (e.g. land-based disposal of dredged material, land-fill, solid waste streams)	Changes to hydrological conditions. ~~Input of anthropogenic impulsive noise~~ Physical disturbance to seabed (temporary or reversible) Physical loss (due to permanent change of seabed substrate or morphology and to extraction of seabed substrate) Other
SN41	Marine minerals cannot be exploited before the effects of seabed mining on the marine environment, biodiversity and human activities have been sufficiently researched, the risk are understood and technologies and operational	measure	The impacts of seabed mining, regardless of depth, if ever permitted could be acute both locally and across the Baltic. Historic mining sites show	The action minimizes or prevents impact of exploitation of mineral resources on sea floor on marine ecosystem.	national/ joint	PRESSURE	Developing of a ~~R~~regional ~~risk assessment~~ framework assuring minimizing impact of exploitation of mineral resources on sea floor with the	Extraction of minerals (rock, metal ores, gravel, sand, shell)	Changes to hydrological conditions. Input of anthropogenic impulsive noise

Code	Action	Type of action	Rationale	Potential effect (if available)	Implemented by	Overseeing WG/ EG	Indicator for achievement	Activities	Pressures
	practices are able to demonstrate that the environment is not seriously harmed, in line with the precautionary principle.		virtually no recovery after 37 years. The action is intended to enforce the risk assessment procedure for planned exploitation of mineral resources on sea floor and thus, minimize the risk of such activity.				development of BAT/BEP as minimum.		Physical disturbance to seabed (temporary or reversible) Physical loss (due to permanent change of seabed substrate or morphology and to extraction of seabed substrate) Other
	Theme: Underwater noise								
SN29	Reduce the impact of impulsive underwater noise on marine biodiversity	measure	The negative impact of underwater noise on several cetacean, fish and invertebrate species has been shown and documented, thus the reduction of underwater noise is an urgent issue that needs to be addressed with consequent measures. ~~For impulsive noise of any source a clear threshold for the whole Baltic Sea based on best available technique (BAT) and best environmental practice (BEP) is~~	Reduce impulsive noise impact on individual marine organisms.	Joint	PRESSURE, ~~EN Noise~~ State&Conservation	~~The Baltic Sea is in GES on impulsive noise.~~ Mitigation measures for the activities generating impulsive noise are in place.	~~Renewable energy generation (wind, wave and tidal power), including infrastructure~~ Research, survey and educational activities (seismic surveys, fish surveys) ~~Restructuring of seabed morphology (dredging, beach replenishment, sea-based deposit of dredged material)~~	Input of anthropogenic impulsive noise. Species disturbance (e.g. where they breed, rest and feed): human presence

Code	Action	Type of action	Rationale	Potential effect (if available)	Implemented by	Overseeing WG/ EG	Indicator for achievement	Activities	Pressures
			~~needed. Regulations to limit noise at source should encourage alternative methods which generate less underwater noise for all activities.~~						
SE24a/ SN26a	Identify at the latest by [2023], as well as regularly update [every 2 years], mitigation measures according to Best Environmental Practice and Best Available Technique for impulsive underwater noise in the Baltic Sea and implement thereafter without delay.	measure	Impulsive noise may have negative impact on marine animals and should be handled or mitigated based on best available technique (BAT) and best environmental practice (BEP).~~The negative impact of underwater noise on several cetacean, fish and invertebrate species has been shown and documented, thus the reduction of underwater noise is an urgent issue that needs to be addressed with consequent measures. For impulsive noise of any source a clear threshold for the whole Baltic Sea based on best available technique (BAT) and best environmental practice (BEP) is~~	Reduce impulsive noise impact on individual marine organisms.	Joint	PRESSURE, State&Conservation~~EN Noise~~	Updated BAT/BEP guidelines for impulsive noise sources. ~~The Baltic Sea is in GES on impulsive noise.~~	~~Renewable energy generation (wind, wave and tidal power), including infrastructure~~ Research, survey and educational activities (seismic surveys, fish surveys) ~~Restructuring of seabed morphology (dredging, beach replenishment, sea-based deposit of dredged material)~~	Input of anthropogenic impulsive noise. Species disturbance (e.g. where they breed, rest and feed): human presence

Code	Action	Type of action	Rationale	Potential effect (if available)	Implemented by	Overseeing WG/ EG	Indicator for achievement	Activities	Pressures
			~~needed. Regulations to limit noise at source should encourage alternative methods which generate less underwater noise for all activities.~~						

Table 4. Draft supplementary information for the actions relevant for Pressure WG the in the Horizontal actions segment

Code	Action	Type of action	Rationale	Potential effect (if available)	Implemented by	Overseeing WG/ EG	Indicator for achievement	Activities	Pressures
	Theme: Hot spots								
EE25a	Renew the effort to eliminate remaining hot spots identified by the Baltic Sea Joint Comprehensive Environmental Action Programme (JCP, 1992) by [2025/2027/2030]	Measure	A list of significant pollution sites around in the Baltic Sea catchment area– HELCOM Hot Spots – was established in 1992 in the framework of the Joint Comprehensive Environmental Action Programme (JCP). This HELCOM hot spots list includes point sources, such as municipal facilities and industrial plants, agricultural areas and rural settlements, as well as sensitive areas such as coastal lagoons and wetlands where special environmental measures are needed. The list of hot spots has demonstrated its effectiveness for prioritising and tackling local environmental issues and thus, contributing to the overall progress towards good	Hot spots in the Baltic Sea catchment area are eliminated from the HELCOM hot spot list if measures are in place that remediate the significant pollution by nutrients and/or hazardous substances that stems from these sites. Thereby, the elimination of hot spots contributes significantly to lowering the inputs of nutrients and hazardous substances to the Baltic Sea.	national	PRESSURE	Elimination of the remaining 40 hot spots identified by the Baltic Sea Joint Comprehensive Environmental Action Programme	Industrial uses (oil, gas, industrial plants) Solid waste (e.g. land-based disposal of dredged material, land-fill, solid waste streams) Urban uses (land use) Waste waters (urban, industrial, scattered dwellings, stormwaters) Other [Agriculture, but is not contained in the list of activities]	Input of nitrogen — diffuse sources, point sources, atmospheric deposition Input of phosphorous — diffuse sources, point sources Input of organic matter — diffuse sources and point sources Input of dioxins Input of heavy metals Input of other substances (e.g. synthetic substances, non-synthetic substances, radionuclides) — diffuse sources, point sources, atmospheric deposition, acute events Input of PBDEs Input of PCBs Input of PFAS Input of TBT

Code	Action	Type of action	Rationale	Potential effect (if available)	Implemented by	Overseeing WG/ EG	Indicator for achievement	Activities	Pressures
			environmental status of the Baltic Sea, in particular with respect to the pollution by nutrients and hazardous substances.						
EN20	[Consider to] Designate “New Hot Spots” as sources of major negative impact on the Baltic Sea marine ecosystem and, for this purpose, specify HELCOM criteria for designation and deletion of "New hot spots", and undertake targeted measures to eliminate them.	Measure	The current HELCOM list of hot spots has demonstrated its effectiveness for prioritising and tackling local environmental issues and mitigating pollution hotspots in particular with respect to nutrients and hazardous substances. The approach should therefore be continued based on revised HELCOM criteria that take the current situation into account and that incorporate further sources of pollution, e.g. litter and potentially point sources in the sea.	The designation of new hot spots with the ultimate aim of their deletion will contribute to reduce the pollution of the Baltic Sea by nutrients, hazardous substances and litter.	national/joint	PRESSURE	HELCOM criteria for designation and deletion of hot spots established New hot spots designated Elimination of newly designated hot spots by 2030.	Industrial uses (oil, gas, industrial plants) Solid waste (e.g. land-based disposal of dredged material, land-fill, solid waste streams) Urban uses (land use) Waste waters (urban, industrial, scattered dwellings, stormwaters) Marine and coastal construction Non-renewable energy generation (fossil fuel and nuclear powerplants) Other [Agriculture, but is not contained in the list of activities]	Input of nitrogen — diffuse sources, point sources, atmospheric deposition Input of phosphorous — diffuse sources, point sources Input of organic matter — diffuse sources and point sources Input of dioxins Input of heavy metals Input of other substances (e.g. synthetic substances, non-synthetic substances, radionuclides) — diffuse sources, point sources, atmospheric deposition, acute events Input of PBDEs Input of PCBs

Code	Action	Type of action	Rationale	Potential effect (if available)	Implemented by	Overseeing WG/ EG	Indicator for achievement	Activities	Pressures
									Input of PFAS Input of TBT Input of pharmaceuticals Input of litter (solid waste matter, including micro-sized litter)
EE25b/ EE27/ EE26	Prioritize inclusion of HELCOM hot spots into investment programmes (national or international) or establish alternative financial mechanisms by [2025/2027] to eliminate hot spots from HELCOM list	Supporting action	A list of significant pollution sites in the Baltic Sea catchment area – HELCOM Hot Spots – was established in 1992 in the framework of the Joint Comprehensive Environmental Action Programme (JCP). In order to mitigate these hot spots as well as newly designated ones and remove them from the list, financial investments are required to undertake specific measures. Prioritising the inclusion of HELCOM hots spots into investment programmes will ensure that the necessary finances are available to conduct the required measures that will		national/joint	PRESSURE	Number of hot spots for which finances for their deletion have been secured	Industrial uses (oil, gas, industrial plants) Solid waste (e.g. land-based disposal of dredged material, land-fill, solid waste streams) Urban uses (land use) Waste waters (urban, industrial, scattered dwellings, stormwaters) Other [Agriculture, but is not contained in the list of activities]	Input of nitrogen — diffuse sources, point sources, atmospheric deposition Input of phosphorous — diffuse sources, point sources Input of organic matter — diffuse sources and point sources Input of dioxins Input of heavy metals Input of other substances (e.g. synthetic substances, non-synthetic substances, radionuclides) — diffuse sources, point sources, atmospheric deposition, acute events

Code	Action	Type of action	Rationale	Potential effect (if available)	Implemented by	Overseeing WG/ EG	Indicator for achievement	Activities	Pressures
			lead to a deletion of the hot spots and consequently to pollution mitigation.						Input of PBDEs Input of PCBs Input of PFAS Input of TBT
EE24	Enhance cooperation with non-HELCOM countries in removing existing hot spots and designate new hot spots applying HELCOM criteria and facilitate undertaking all possible measures to eliminate them.	Measure	There are currently still 6 hot spots from the list of significant pollution sites established in 1992 that are situated in non-HELCOM countries (Belarus, Ukraine, Czech Republic) and that contribute to the pollution of the Baltic Sea with nutrients and hazardous substances. An improved cooperation with those non-HELCOM countries would facilitate the deletion of these hotpots and would thereby lower the inputs of nutrients and hazardous substances to the Baltic Sea. The identification of new hot spots of significant pollution in non-HELCOM countries can contribute to further lowering the inputs	Hot spots are eliminated from the HELCOM hot spot list if measures are in place that remediate the significant pollution by nutrients and/or hazardous substances that stems from these sites. Thereby, the elimination of hot spots contributes significantly to lowering the inputs of nutrients and hazardous substances, and in the future potentially also litter to the Baltic Sea.	~~national/~~joint	PRESSURE	Elimination of the remaining hot spots in non-HELCOM countries identified by the Baltic Sea Joint Comprehensive Environmental Action Programme. ~~and~~ ~~d~~Designation of new hot spots in non-HELCOM countries and their possible deletion from the hot spot list.	Industrial uses (oil, gas, industrial plants) Solid waste (e.g. land-based disposal of dredged material, land-fill, solid waste streams) Urban uses (land use) Waste waters (urban, industrial, scattered dwellings, stormwaters) Marine and coastal construction Non-renewable energy generation (fossil fuel and nuclear powerplants) Other [Agriculture, but is not contained in the list of activities]	Input of nitrogen — diffuse sources, point sources, atmospheric deposition Input of phosphorous — diffuse sources, point sources Input of organic matter — diffuse sources and point sources Input of dioxins Input of heavy metals Input of other substances (e.g. synthetic substances, non-synthetic substances, radionuclides) — diffuse sources, point sources, atmospheric deposition, acute events Input of PBDEs Input of PCBs Input of PFAS

Code	Action	Type of action	Rationale	Potential effect (if available)	Implemented by	Overseeing WG/ EG	Indicator for achievement	Activities	Pressures
			of nutrients, hazardous substances and potentially also litter to the Baltic Sea.						Input of TBT Input of pharmaceuticals Input of litter (solid waste matter, including micro-sized litter)