

Regional environmental policy supporting management of hazardous substances – the HELCOM approach

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HELCOM



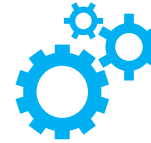
HELCOM is a regional...



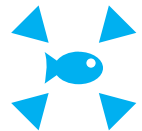
**environmental
policy maker**
*e.g. Baltic Sea
Action Plan*



**body for developing
regional
recommendations**
*e.g. HELCOM
Recommendations and
regional Guidelines*



coordinating body
*e.g. HELCOM
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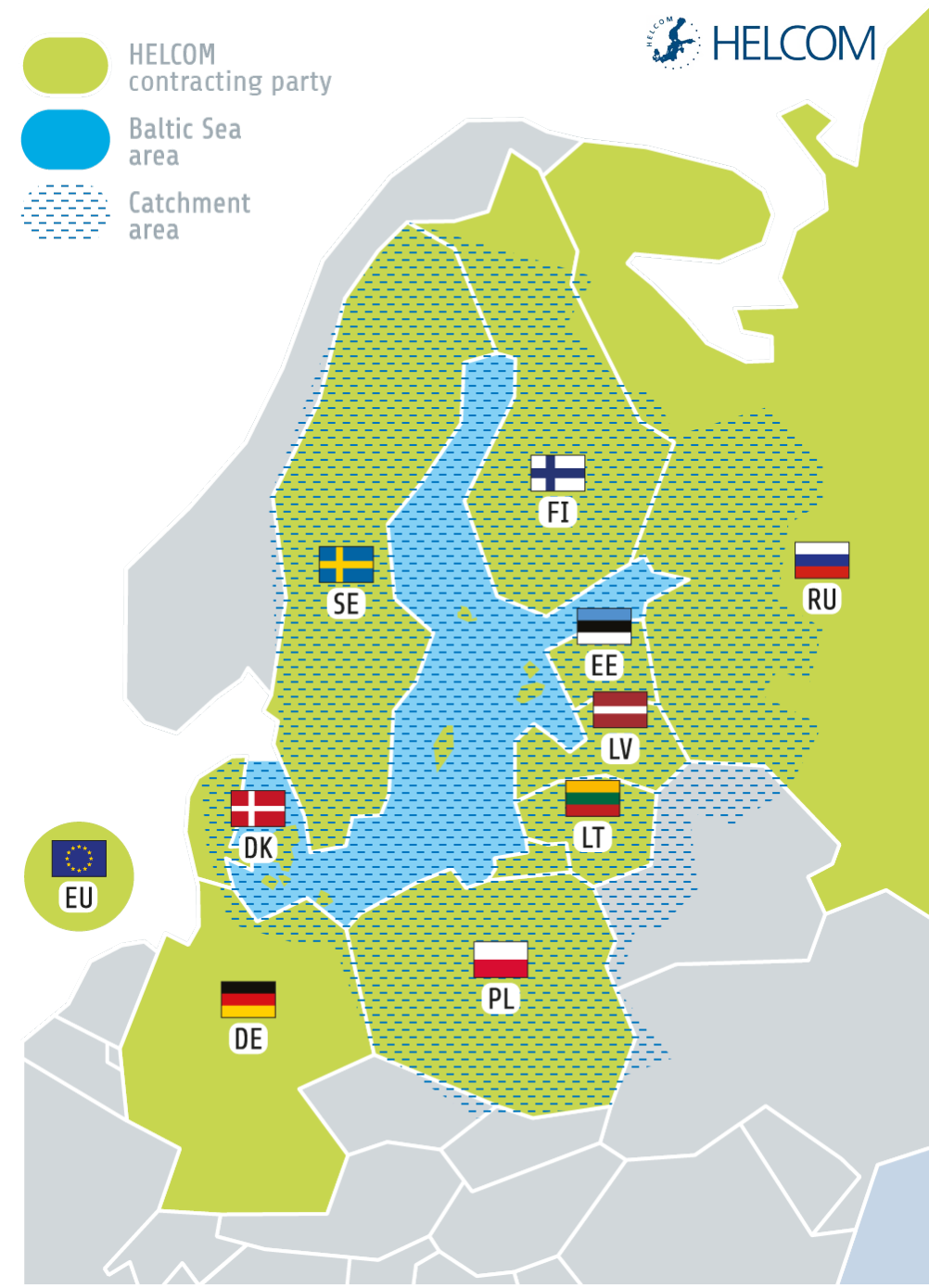


**environmental
focal point** *e.g.
holistic
assessments of
the state of the
sea*

**Tools include: Action plans
& strategies**
Contain actions and
measures with such as **Baltic
Sea Action Plan**, Regional
Nutrient Recycling Strategy,
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Science Agenda



**supervisory
body**
*e.g. nutrient
reduction
scheme with
MAI and NIC*



About HELCOM



1974: The Helsinki Convention signed by 7 Contracting Parties



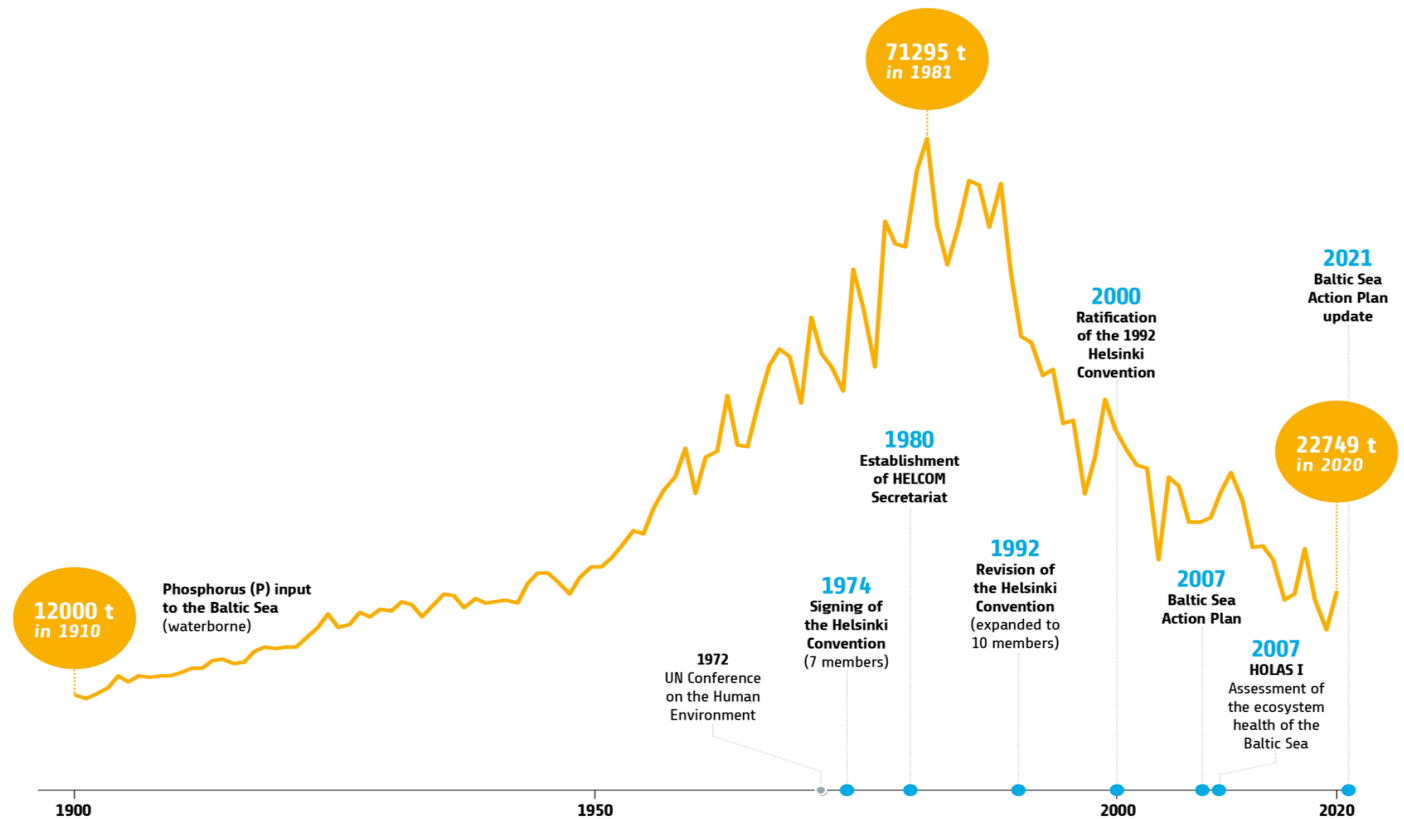
1980: HELCOM Secretariat established



1992: 10 Contracting Parties
EE, EU, DK, DE, FI, LV, LT, PL, SE, RU



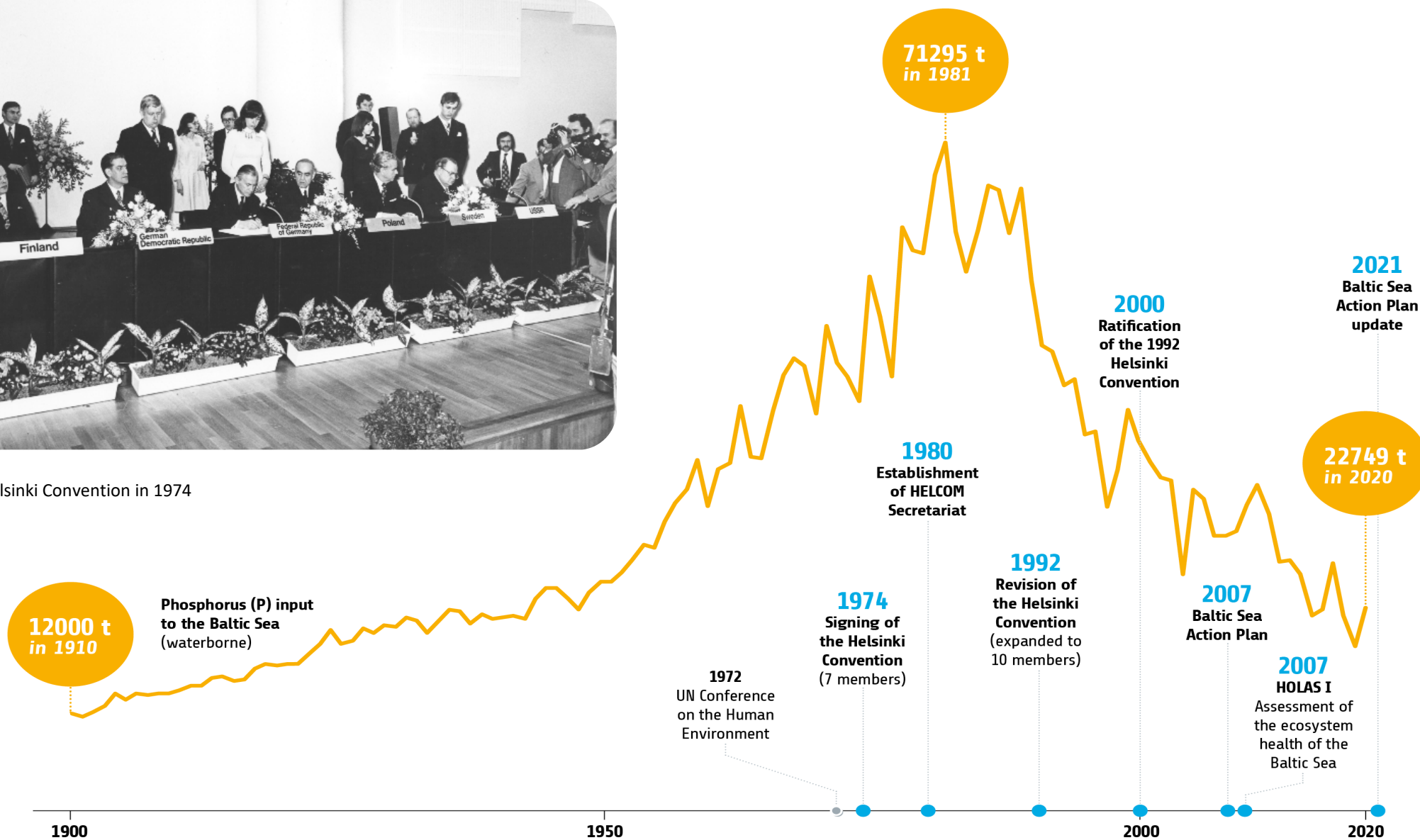
2024: HELCOM celebrates 50th anniversary



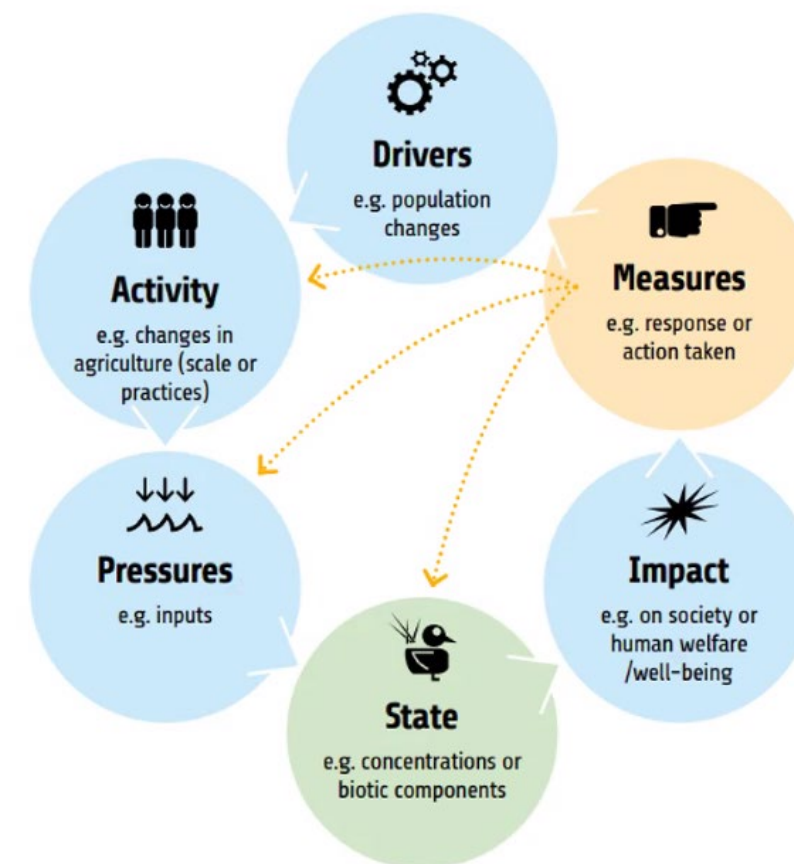
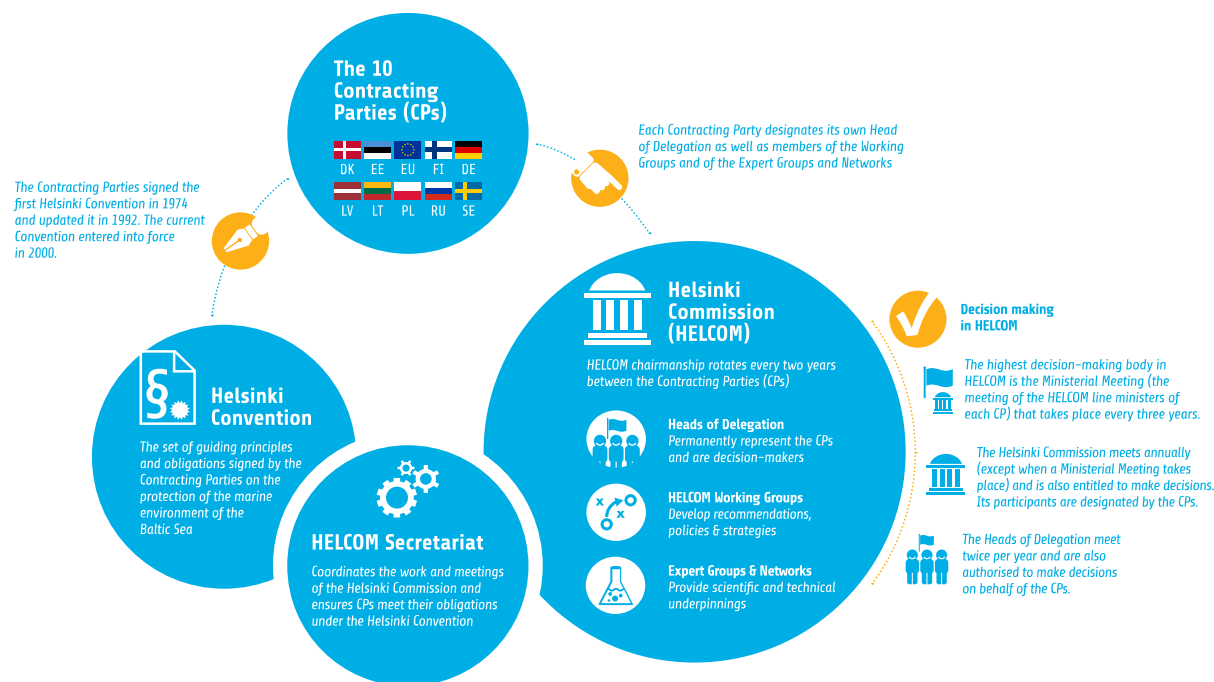
▲ Signing of the Helsinki Convention in 1974



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HELCOM, DAPSIM/R Framework and measures



Decision making process in HELCOM:
a bottom-up, science-based approach

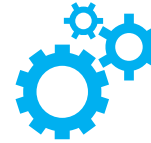
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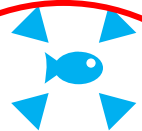
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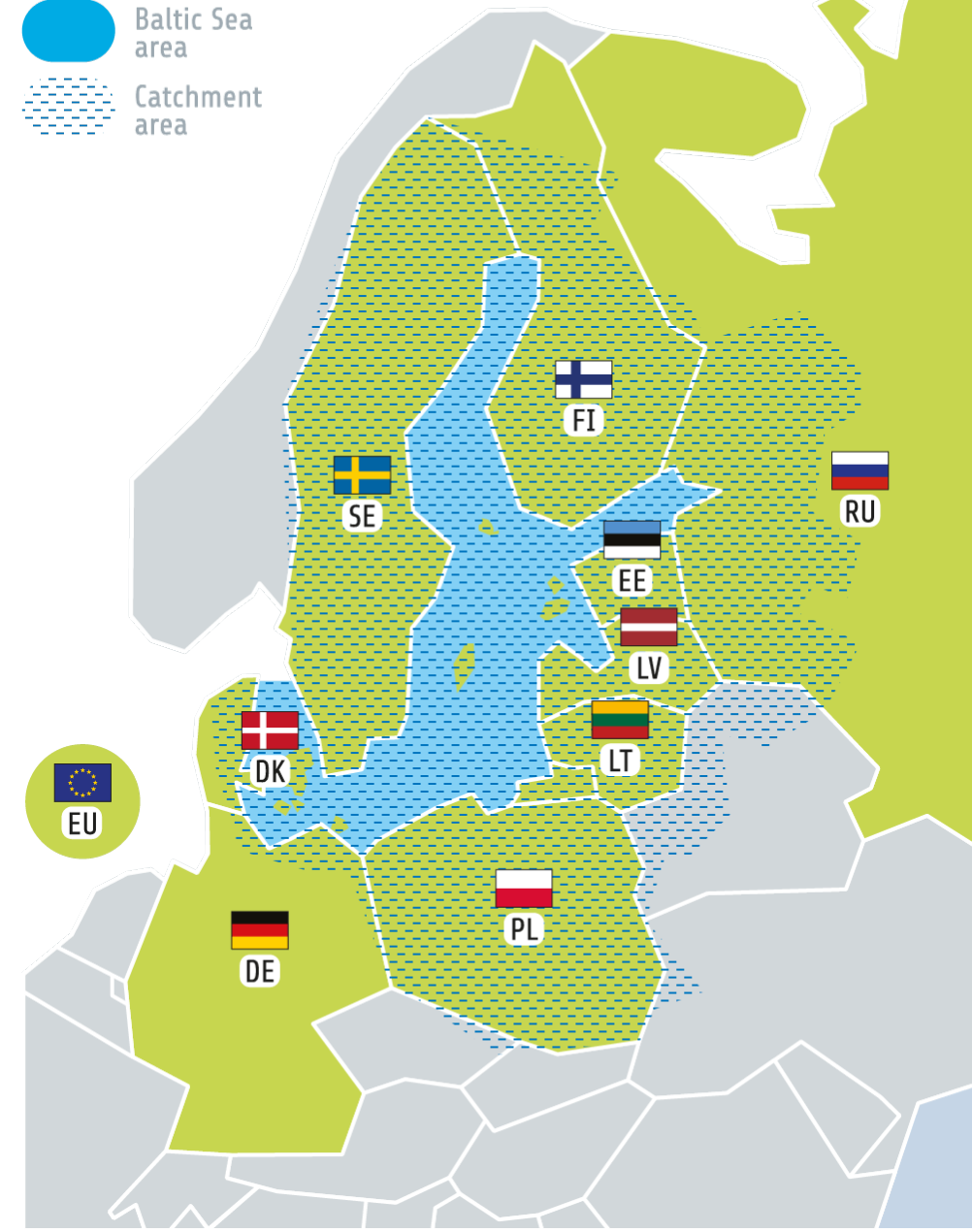


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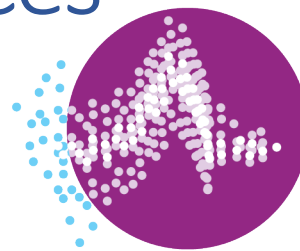
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HOLAS 3 (2026-21): Indicators of relevance – Hazardous substances

Hazardous substances

- PFOS
- HBCDD
- PBDEs
- PCB, dioxins and furans
- PAHs (and their metabolites)
- TBT (and Imposex)
- Radioactive substances
- Mercury
- Copper
- Lead
- Cadmium
- **Diclofenac***
- Oils spills
- White-tailed sea eagle
- Reproductive disorders: amphipod embryos**



Hazardous substances

Hazardous substances only integrates indicators on substance concentrations and only fully operational HELCOM 'core' indicators.

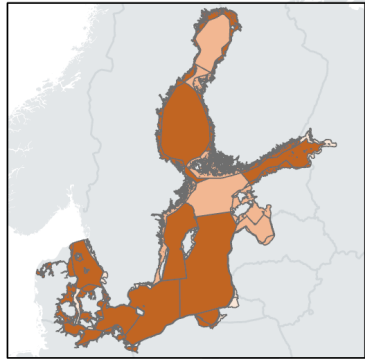
HAZ Thematic assessment (2023) also has test cases on biological effects, screening and sediment cores.

*pre-core = more development/agreement expected, **supplementary = not applied by all Contracting Parties

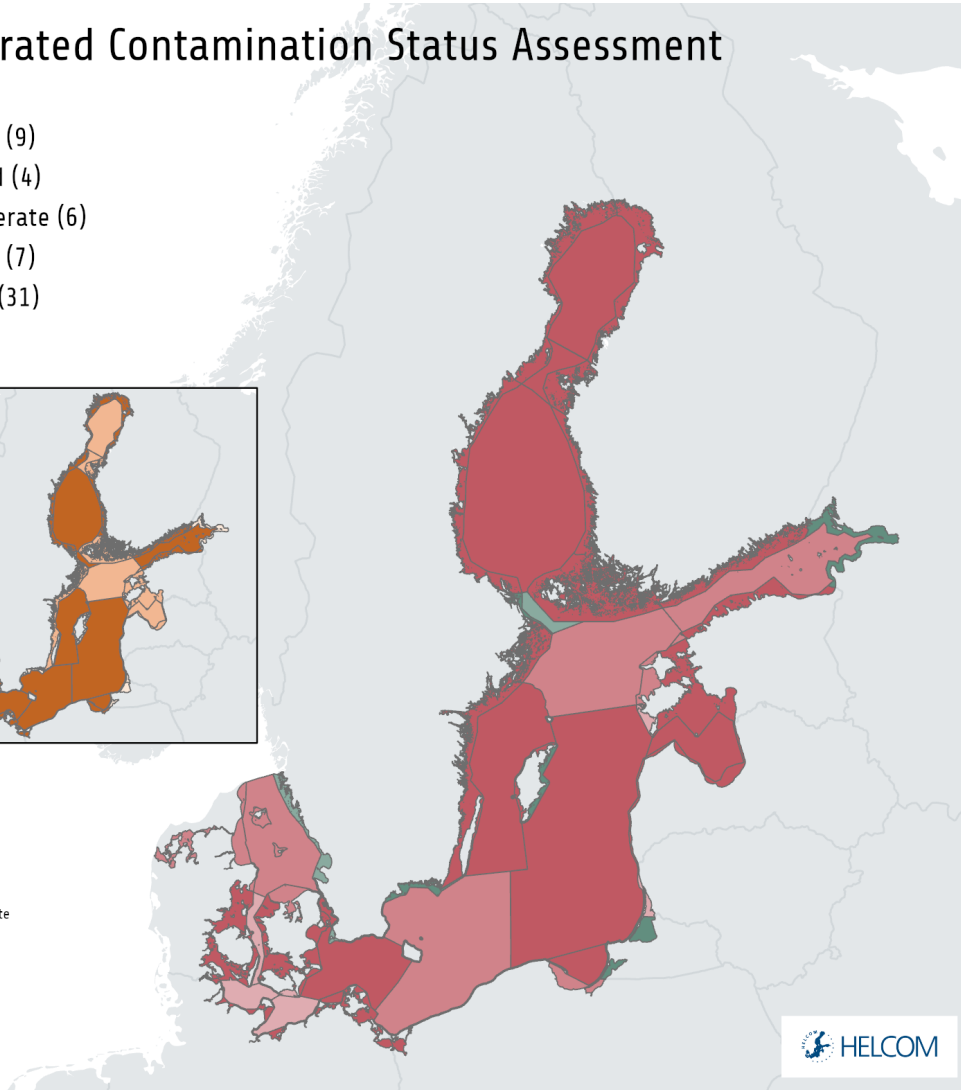
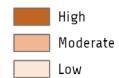
HOLAS3 assessment on hazardous substances

Integrated Contamination Status Assessment

Status



Confidence



Good status – High Confidence

- Meets all rules to achieve high confidence
- But lacks quite a few indicators
- Importantly, no evaluation of PBDEs in biota
- PBDEs in biota also not evaluated in 3 other sub-basins, where status is moderate



The Baltic Patient: HOLAS 3 – little improvement in the state of the Baltic Sea



The Baltic Sea is under increasing impacts from **climate change** and **biodiversity degradation** catalysed by eutrophication, pollution, land use and resource extraction.



Little to no improvement of the Baltic Sea environment occurred during the assessment period.



Measures to reduce pressures on the Baltic Sea **are working**, when they are implemented, and the agreements in the updated Baltic Sea Action Plan remain highly relevant.



The effects of **climate change** are expected to increase in the future, increasing the need for measures to enhance ecosystem resilience and mitigate their negative impacts.



Transformative changes are needed in all socioeconomic sectors interacting with or affecting the Baltic Sea environment. **Actions are needed** both to stop current negative trends and to protect and restore ecosystems.

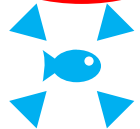


Ecosystem knowledge and **policies** for the Baltic Sea environment have developed substantially within the past six years.

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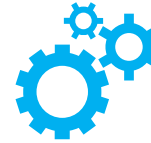
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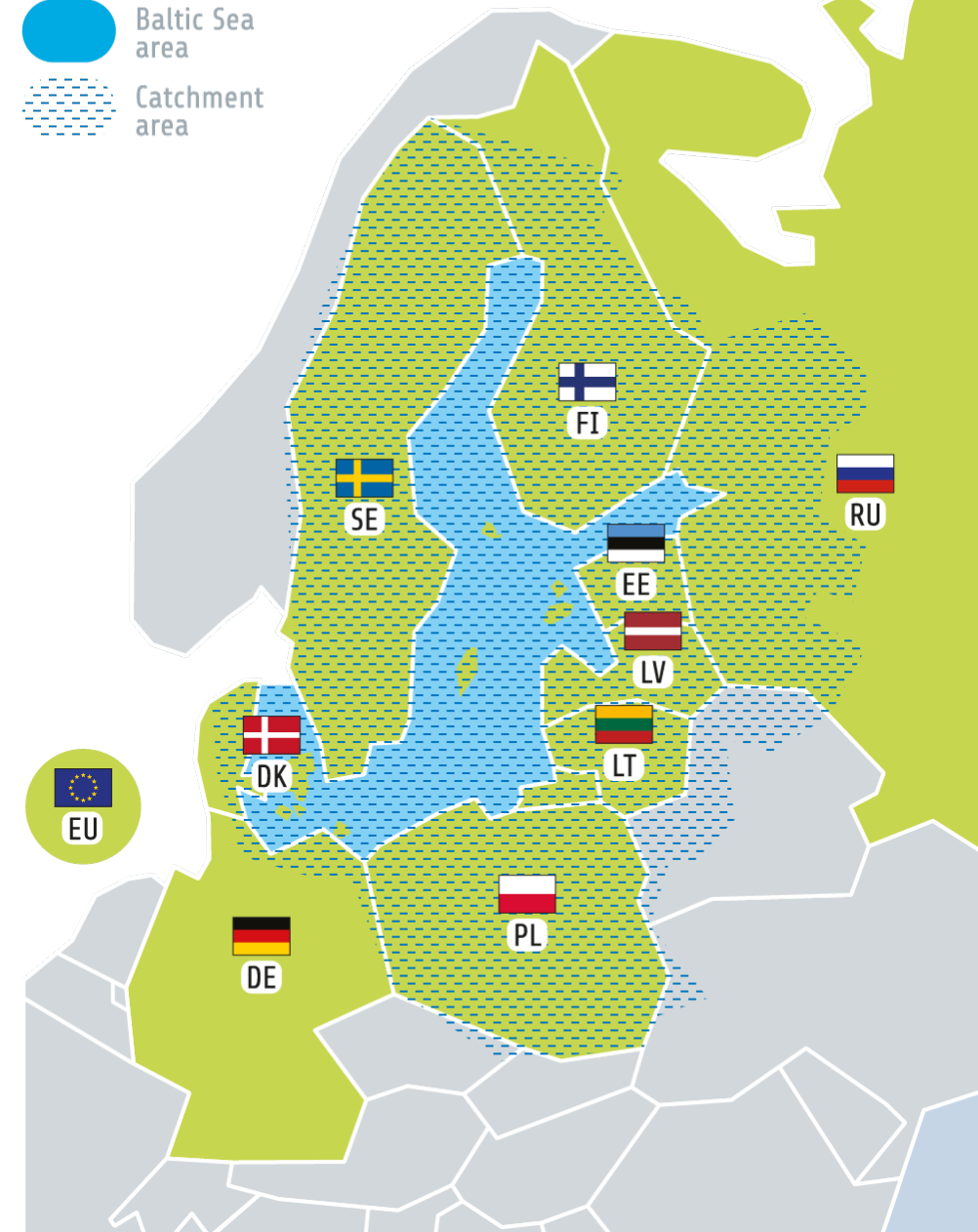
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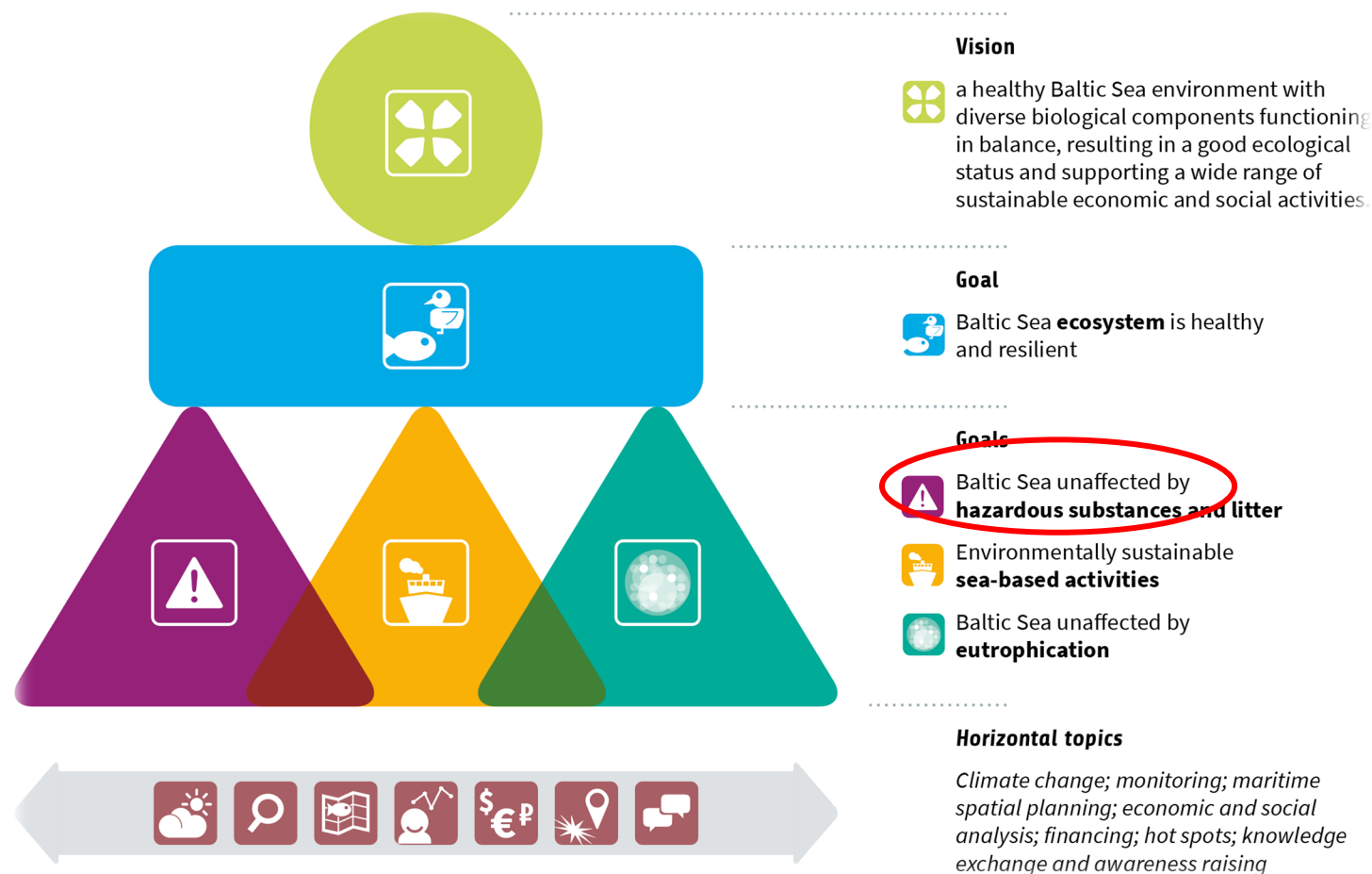
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2021 Baltic Sea Action Plan: structure & goals



Logic in the structure:

Chain of consequence, whereby human **activities** result in **pressures** on the environment, which in turn affect the **state** of biodiversity, which has been used as a basis when elaborating the updated BSAP

<https://helcom.fi/baltic-sea-action-plan/>

Implementation of the 2021 BSAP

- The 199 actions have:



individual
target years



been identified as
supporting action
or measure



been linked to
relevant pressures
and activities



been assigned one or
several HELCOM bodies
responsible for taking the
work on the action
forward.



been dedicated
criteria for
achievement

...and the level of implementation of each action has been identified as national or joint.

Reporting of implementation **by 2025** will be published in late 2026 in HELCOM Explorer: <https://maps.helcom.fi/website/HELCOMexplorer/>



Hazardous substances & litter



Hazardous substances and litter goal

“Baltic Sea unaffected by hazardous substances and litter”



Ecological objectives

Hazardous substances

- Marine life is healthy;
- Concentrations of hazardous substances are close to natural levels;
- All sea food is safe to eat;
- Minimal risk to humans and the environment from radioactivity.

Marine litter

- No harm to marine life from litter.



Management objectives

Hazardous substances

- Minimize input and impact of hazardous substances from human activities.

Marine litter

- Prevent generation of waste and its input to the sea, including microplastics;
- Significantly reduce amounts of litter on shorelines and in the sea.





To reduce inputs, further measures were agreed upon:

- 32 Actions
- Themes:
 - Hazardous substances
 - Legacy pollutants – *e.g. heavy metals, dioxins, organotins*
 - Contaminants of emerging concern – *e.g. pharmaceuticals, certain groups of PFASs*
 - Marine litter



Earlier projects supported 2021 BSAP implementation



- BSAP **HL1**: Develop a regional strategic approach and, on the basis of that approach, an action plan for HELCOM work on hazardous substances by 2024
- **HL9** on utilizing information obtained under international various policies and policy frameworks addressing the use of chemicals
- **HL10** on establishing a mechanism for managing the HELCOM list of priority substances

Holistic Action Plan – Hazardous substances (HAPhazard)

Hazardous Substances Strategic Holistic Action Plan – improving management to reduce risk and impact (HAZ-SHAP)

- **HL13**: Developing monitoring for the biological effects

Project on biological effects (H-BEC)

Application of biological effects methods in monitoring and assessment of contaminants in the Baltic Sea (BEACON)

Other earlier projects (supported also HL1 work e.g. with data calls and analyses)



EMPEREST - Eliminating Micro-Pollutants from Effluents for REuse Strategies

- Methodological recommendations to monitor and assess the **PFAS group** in the aquatic environment
- risk assessment framework to identify and assess PFAS-related risks and propose relevant mitigation strategies for municipalities
- mobile pilot containers with advanced treatment technologies piloted to evaluate their effectiveness and economic viability to remove micropollutants from wastewater effluent
- Supports also BSAP actions **HL21** to restrict use and prevent releases of perfluorinated alkyl substances, phenolic compounds with endocrine disrupting effects and chlorinated paraffins and **HL29** on limiting PFAS containing firefighting foams

PharmaSea - Pharmaceutical Substances in the Baltic Sea

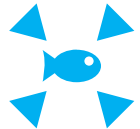
- Supporting implementation of **HL22** on improving the knowledge base on occurrence of **pharmaceuticals** in the environment, their persistence, and harmful effects and ensure availability of this information for broad expert community and
- **HL23** on identifying priority pharmaceuticals utilising the best available knowledge



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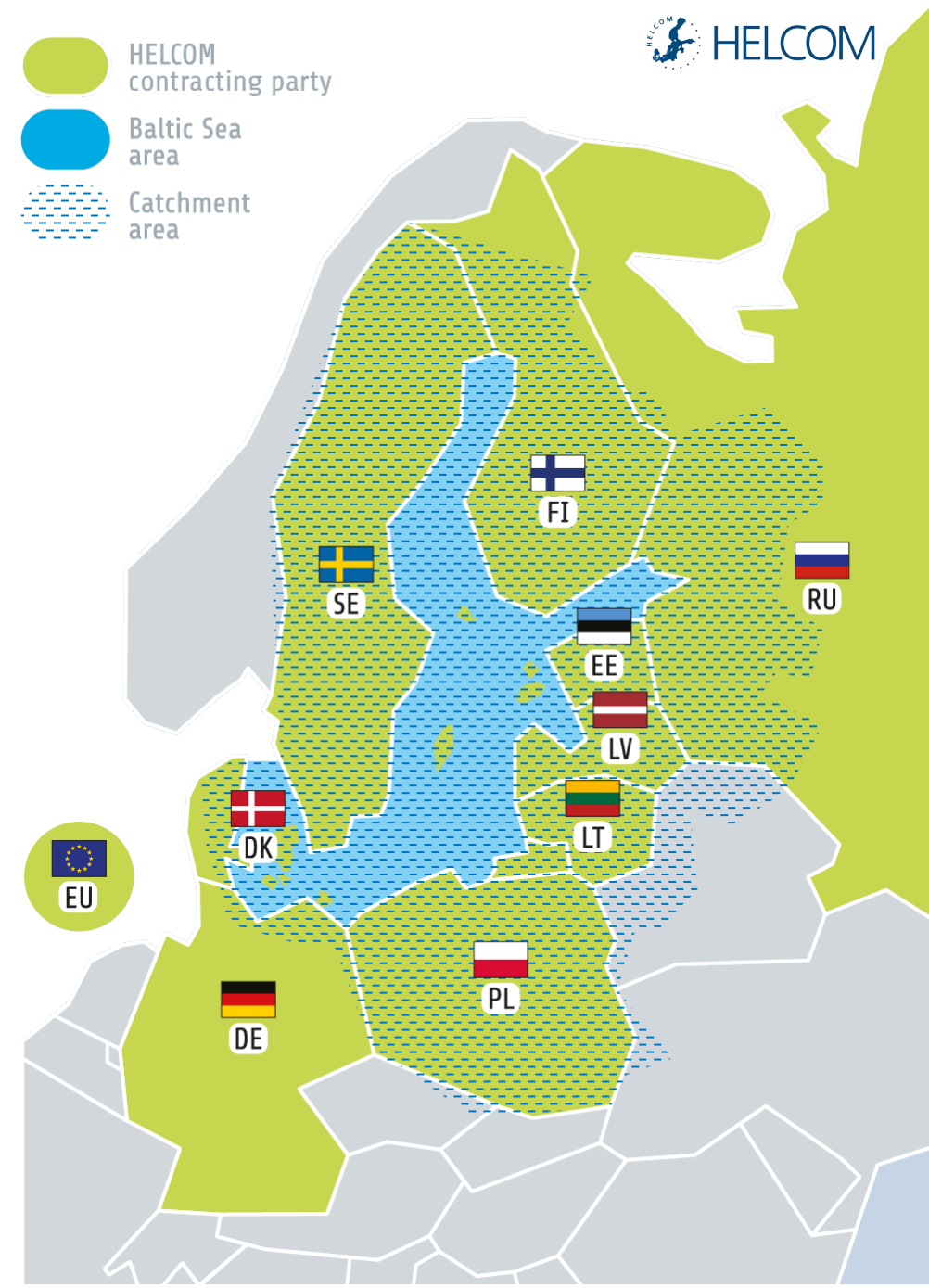
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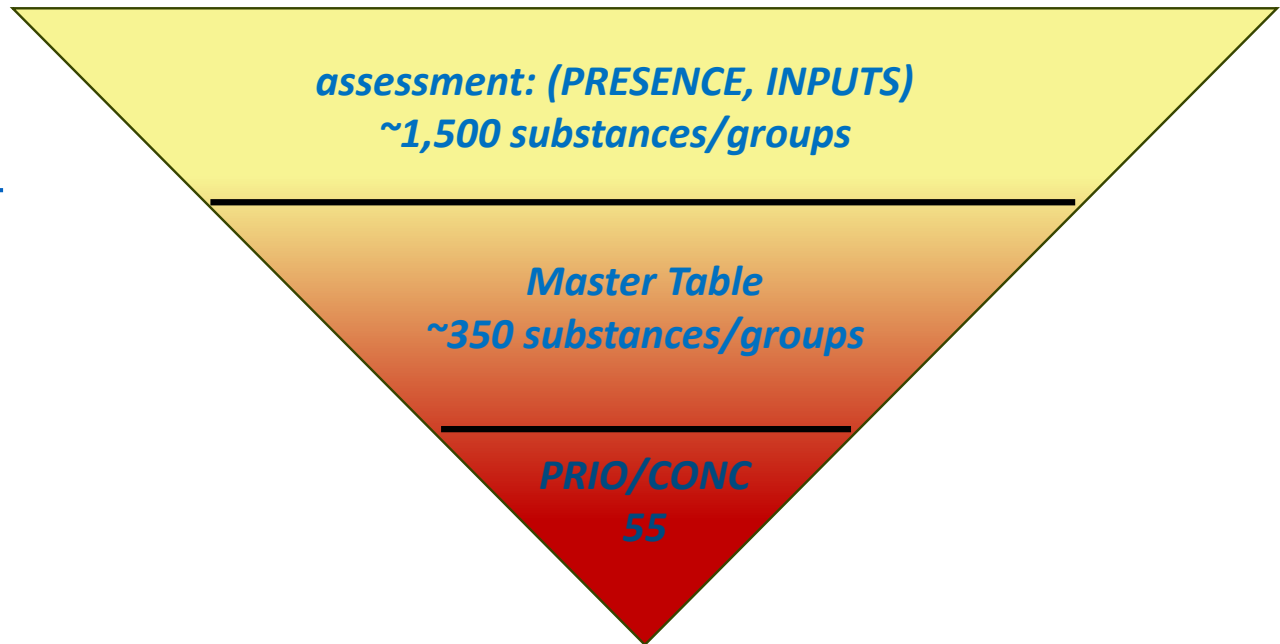
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The regional work for hazardous substances is progressing... (HL1, HL9 ,HL10)

- [HELCOM's strategic approach for managing hazardous substances](#) adopted (March 2025)
 - Prioritization framework, how to address possible sources and pathways
- [HELCOM Recommendation 42-43/6 List of priority substances, sources of release and uncertainties to address](#) adopted (March 2025)
- **Regional Action Plan on Hazardous Substances** (adopted in July 2026)
 - Including measures addressing land-based sources and activities such as agriculture (pesticides) or medical use (pharmaceuticals) and
 - sea-based sources such as maritime traffic, platforms or energy production



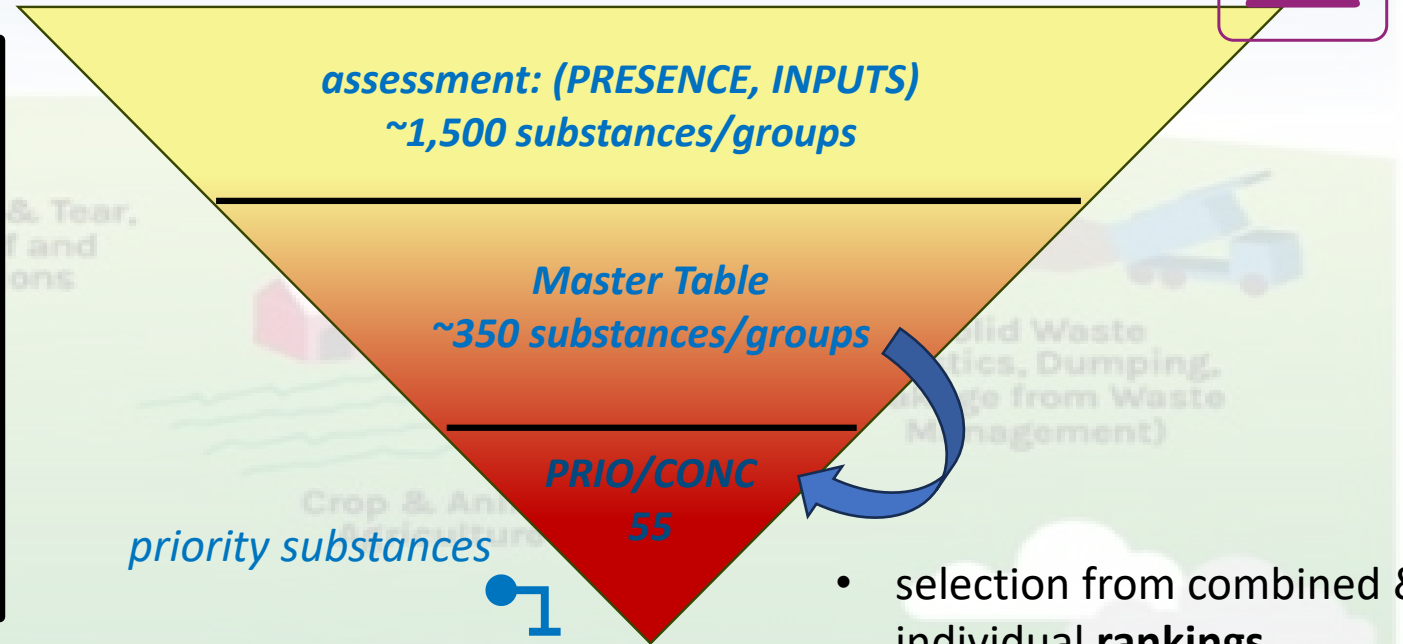
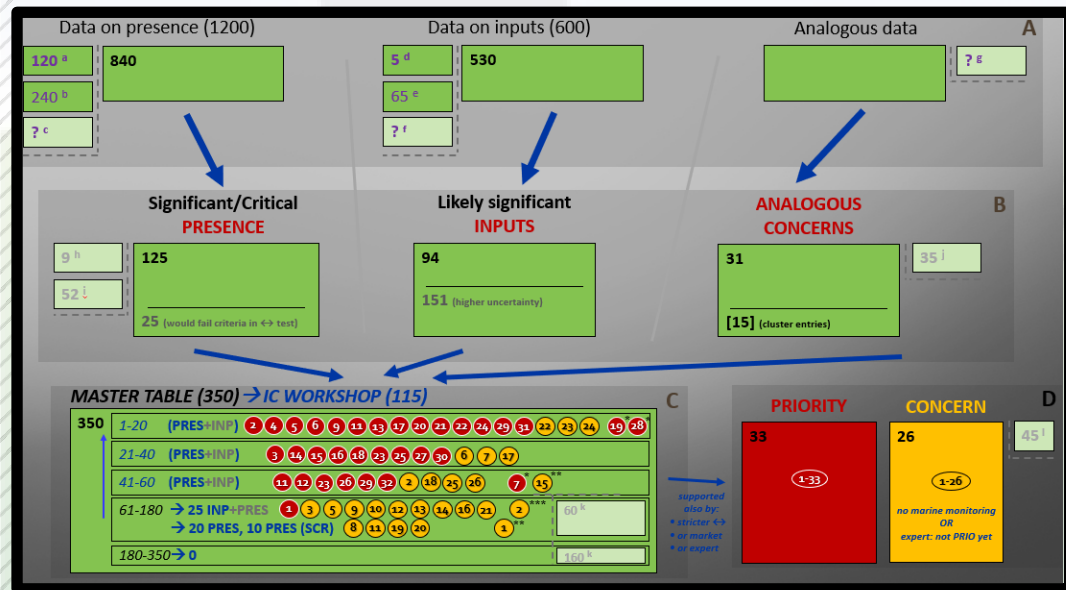
New website on the HELCOM priority substances and substances of concern



- **33 priority substances:** substances and groups of substances that pose the highest anticipated risk to the Baltic Sea, either currently or in the near future, strategic focus of HELCOM work
- **22 substances of concern:** higher uncertainty regarding the actual risk they pose
- <https://helcom.fi/baltic-sea-trends/hazardous-substances/helcom-list-of-priority-substances-and-substances-of-concern/>



How we prioritized



- selection from combined & individual **rankings**
- further **uncertainty** analysis
- **market** information
- **expert** judgement

sub-listed as substances of concern

- *evidence did not include marine monitoring data (but e.g. marine screening or inputs monitoring)*
- *or expert judgement pointed towards listing rather as substance of concern*



More details: Fact sheets!

PFAS (Per- and polyfluoroalkyl substances)

General sectors: *Industry and commercial products*

(CAS numbers: e.g. 335-67-1, 1763-23-1, 355-46-4, 375-05-1, 375-73-5, 307-24-4, 375-22-4, 2706-60-2, 2706-91-4, 325-76-2, 307-52-1, 2058-94-8, 275-85-0, 72629-94-8, 275-60-8, 335-77-3, 376-06-7, 67605-19-5, 1651741-4, 62027-80-3, 85845-44-8, 647-42-7, 678-39-7, 1196811-41-9, EC numbers: e.g. 206-207-9, 217-179-4, 206-587-1, 206-801-3, 206-753-1, 206-194-1, 206-786-1, 206-103-2, 206-301-2, 206-409-3, 206-202-0, 218-165-4, 206-788-6, 276-745-2, 206-800-8, 206-801-9, 206-803-4, 267-438-1, 340-582-5, 700-242-3, 211-477-1, 211-468-0, 682-239-6 / Entry number in HELCOM list of priority substances: 21)

DISSERS ACTIVITIES PRESSURES STATE IMPACTS

Why a HELCOM priority?

Main evidence

S Concentrations of PFOS exceed the applied threshold value in **37** of the 39 examined areas (assessment units) of the Baltic Sea. The threshold is exceeded in both coastal and off-shore areas (**13/13** assessed off-shore areas). In these 37 areas, **100%** of the assessable samples in **biota** (and/or water, for which the thresholds are exceeded more rarely) exceed the threshold value. This is based on regular monitoring data gathered by HELCOM Contracting Parties and reported to the HELCOM COMBINE database for the period 2016-2021, as part of the more limited, PFOS indicator¹.

By further considering how much above or below the threshold each concentration is, and how often the substance is detected, PFAS scores **9.3/10** (confidence range: **9.3 – 9.3**) in the scale established when assessing the criticality/significance of current levels in the Baltic Sea pose, where 5 indicates concern and 10 extreme risk, and the range reflects the level of reliability and representativeness of concentrations and the thresholds.

The threshold values for PFOS, for biota and water, were acquired from the EC proposed Directive amending WFD and EQSD² (not yet in effect as of February 2025).

Concentrations of PFNA, PFDA, PFUnDA, PFTiDA, PFDoDA, PFOS, FOSA, and other PFAS substances also frequently exceed their respective threshold values in biota, while TFA, 6:2 FTS, PFOA, PFHxS and N-EtFOSA (and other PFAS) are in addition to previous often detected in water at high concentrations. This is based on monitoring data for the period 2015-2023 as reported by Contracting Parties (CPs) as response to a data call organized by HELCOM for PFAS.

It is noted that **high trophic magnification** has been reported, for PFAS³.

I Current levels in the Baltic Sea indicate potential negative impacts on pelagic biota, top predators such as mammals and birds and humans via consumption of seafood.

Supporting evidence

I PFAS are considered of **especially concerning mode of toxicity**: for example some of them are toxic for reproduction and/or endocrine disruptors⁴.

Overall assessment

When assessing current levels in the Baltic Sea, current inputs, and the severity of the relevant toxicity mechanism, PFOS alone scores **94-94/100** in the scale established for assessing the overall risk for impacts/threat for the Baltic Sea, where 50 indicates concern, 100 extreme risk, and the width of the span outlines the uncertainty in the assessment. Besides PFOS, thousands of other Per- and polyfluoroalkyl substances have been shown to have hazardous properties and to exhibit concerning environmental fate/occurrence profiles¹². This substance group entry reflects any chemical containing at least one saturated CF2 or CF3 moiety¹³.

Facts relevant for management considerations

Causal chain and pathways

A Although PFOS is restricted under Annex B of the Stockholm Convention, there are specific exemptions, such as in metal plating, fire-fighting foams for liquid fuel vapour suppression and liquid fuel fires, and insect baits. It is not registered for EU REACH⁵, thus likely on EU market in low tonnage as it has been notified by about 30 companies without specific use information⁶. There are expected releases e.g. from legacy firefighting foams and life of products containing it.

Release estimates for the broader PFAS (non-polymeric) group: textile, upholstery, leather, apparel and carpets (80%), food contact materials and packaging (7%), electronics and semiconductors (7%)⁷. Certain cookware and paints may as well contain PFAS⁸.

P Based on available estimations, PFOS appear to enter the Baltic Sea at the following amounts: **rivers** (0.2 t/y, WATERBASE⁹), atmospheric deposition (0.06 t/y), direct emissions from land-based activities (0.02 t/y, Undeman et al, 2022¹⁰). **WWTPs** is roughly estimated to contribute with 0.07 t/y. There is available information also about estimated inputs of further individual PFAS.

Relevant policies (existing or planned measures)

- M (on A/P)**
- Some sub-groups of PFAS are listed under **Stockholm Convention** on POPs (signed by all HELCOM Contracting Parties) – Annexes A (elimination) / B (restriction) – accordingly **EU POPs Regulation** – including respective **national Action Plans**.
 - Some PFAS are listed as **REACH SVHC** (basis: toxicity for reproduction / PBT / endocrine disruption, depending on the case). In 2023, authorities from Denmark, Germany, the Netherlands, Norway and Sweden submitted a **REACH restriction proposal**¹¹.
 - PFOS is listed as a priority hazardous substance under the **EU WFD** (instead, PFAS is listed as priority hazardous substance under its update proposal) – including respective national **Programmes of Measures for this**.
 - PFOS is a more limited **HELCOM Indicator**.
 - There are provisions in EU Best Available Reference Documents for these substances

References:

1. 2. 3. 4. 5. 6. 7. 8. 9. 10. 11. 12. 13.

[Note: Listing of detailed references will be provided in an upcoming update of the fact sheet – for a listing of the most common references among the different substances see the section at the end of the consolidated document which includes all the fact sheets]

HELCOM list of priority substances



Alkylphenols and their ethoxylates
Bisphenols
PBDEs (Polybrominated diphenyl ethers)
PFAS (Per- and polyfluoroalkyl substances)
Phthalates

Octinoxate

Dioxins (dioxin-like PCBs, dioxins and furans)
Hexachlorobenzene
PAHs (Polycyclic Aromatic Hydrocarbons)

Carbamazepine
Clarithromycin
Diclofenac
Gabapentin

Organotins

Diuron
Irgarol (Cybutryne)

17b-estradiol
17α-ethinylestradiol
Estrone

Chlorpyrifos
Cypermethrin
DDT and its degradation products
Heptachlor and its degradation products
Lindane (gamma-Hexachlorocyclohexane)
Nicosulfuron

Arsenic and its compounds
Cadmium and its compounds
Chromium and its compounds
Copper and its compounds
Lead and its compounds
Mercury and its compounds
Nickel and its compounds
Zinc and its compounds

HELCOM list of substances of concern



1-Dodecanamine, N-dodecyl-N-methyl-
Butyl acrylate
Das2 (C.I. Flurescent Brighterner 220)
DSBP (distyrylbiphenylsulfonate)
N-Methyl-2-pyrrolidone (NMP)
Nonanedioic acid (azelaic acid)
Octadecanamide

2-Propen-1-yl 2-(cyclohexyloxy)acetate
Bemotrizinol
Cetylpyridinium (hexadecylpyridinium chloride)
Chlorhexidine

2,4,6-Tribromophenol (TBP)
2-Ethylhexyl diphenyl phosphate (EHDPP)
Bis(2-chloro-1-methylethyl) 2-chloropropyl
phosphate
Dechlorane Plus (anti-DDC-CO)
Pentabromobenzyl acrylate (PBB-Acr)
Tris(2-ethylhexyl) phosphate (TEHP)

Kinoprene
Metsulfuron-methyl
Prometon

Cobalt and its compounds
Uranium and its compounds

HELCOM relevant sources of HAZ substances:



| | |
|--|---|
| Industrial sectors (including where relevant whole life cycle of products), including among many sectors: mining, production/smelting of non-ferrous metals, thermal power stations and other combustion installations, production of pig iron or steel, polymers/resins, batteries, paints/coatings/inks, adhesives, production of pulp/paper/board/wood products, electronics, medical devices, landfills (various hazardous substances, including also nanomaterials from high-tech industries) | Shipping (antifouling, scrubber emissions, oil spills, flame retardants, bilge or ballast water, grey water and sewage) |
| Agriculture (use of pesticides, veterinary products and micronutrients, emissions of hormones) | Dumped munitions (explosives and chemical warfare agents) and wrecks in the Baltic Sea (munitions and their toxic degradation products include amongst others α chloroacetophenone, sulfur mustard, clark-type munitions, TNT, HMX, RDX, etc.) |
| Dredged material deposition and seabed disturbance activities | Atmospheric deposition to Baltic Sea and its catchment |
| Wastewater treatment plants (e.g. pharmaceuticals and personal care products, disinfection byproducts) | Off-shore wind farms, floating terminals of Liquefied Natural Gas, and other renewable energy sectors including hydrogen production (antifouling / disinfection agents (sodium hypochlorite) and by-products, corrosion protection, oil spills etc.) |
| Stormwater (e.g. metals, PAHs, biocides, disinfection byproducts) | Submarine sediment banks or landslides of / runoff from contaminated soil of industrial origin – in particular relating to abandoned plants |
| | Aquaculture (pharmaceuticals, disinfection agents and byproducts, biocides, food additives) |

New projects: [HAZGONE](#) (Connecting upstream and downstream measures for better hazardous substances governance and policy in the Baltic Sea region), [PRISM](#) (Preventing Risk by Integrating Surveillance into Management of hazardous substances) and [ESTRADI](#) (Enhanced STakeholder Roles for ADdressing Inputs to Baltic Sea from industrial products)





Horizontal topics

New **hot spots** criteria in place,
countries testing during 2026

<https://helcom.fi/action-areas/industrial-municipal-releases/helcom-hot-spots/>



- Climate change
- Monitoring
- Maritime spatial planning (MSP)
- Economic and social analysis
- **Hot spots**
- Knowledge exchange and awareness raising
- Financing

HT24: Consider designating **HELCOM hot spots** by 2025 on the basis of identified additional **sources of major negative impact** on the Baltic marine ecosystem. Starting with the development of specifying criteria for the designation and deletion of the hot spots by 2023, and based on those criteria, initiate and undertake targeted measures with the aim of eliminating such possible new hot spots.

Regional HELCOM policy work – takeaway points

- Key to success in regional policy and management: intergovernmental political will and long-term commitment
 - Jointly agreed **monitoring** methods and practices, joint **reporting** and **data** management – continuous improvement cycles
 - Sound and robust **scientific** basis and modelling
 - Clear and transparent joint **tracking** of progress of the joint targets
- **Efficient implementation** of the already adopted Recommendations and guidelines are the key to succeed in reaching the HELCOM vision:



HELCOM vision:

“A healthy Baltic Sea environment with diverse biological components functioning in balance, resulting in a good ecological status and supporting a wide range of sustainable economic and social activities.”



199 actions and
measures



Implementation date: by
2030 at the latest



Science-based plan





HELCOM
mm 2026

HELCOM Ministerial Meeting
Warsaw, Poland • 4 November 2026



Thank you!

