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Background

Pollution caused by hazardous substances still poses risks to the Baltic Sea area. Loads and impacts of some hazardous substances have been reduced considerably during the past 20-30 years, but many of them are still of a high concern and new ones appear in the watching list.

The Baltic Sea Action Plan (BSAP) identified ecological objectives for hazardous substances and the list of eleven hazardous substances that are of specific concern in the Baltic Sea area. HELCOM Recommendation 31E/1 “Implementing HELCOM’s objective for hazardous substances” outlined the strategy to implement the HELCOM objective for hazardous substances. The Recommendation also indicates that the list of the priority substances is to be under review, based on monitoring and other scientific data. The HELCOM List of Priority Hazardous Substances is to be updated on regular basis.

In the 2013 Ministerial Declaration the HELCOM Contracting Parties agreed to complete and further develop the set of HELCOM core indicators that are to be applied in the Second holistic assessment of the health of Baltic Sea. **The current set of core and pre-core indicators, including hazardous substances, was developed by the CORSET II project and dealt with by HOD 48-2015 (cf. document 2-1).** The boundaries of good environmental status were agreed for concentrations of some of the substances.

Regular monitoring of input of hazardous substances into the marine environment is required to follow up the implementation of the BSAP and measures stipulated by the HELCOM Recommendations. The monitoring should be based on measuring of concentration of the selected compounds in air and surface water with subsequent calculation of their discharges into the Baltic Sea. Also data on emissions of the substances reported at national and international level (e.g. CLRTAP, E-PRTR etc.) can be used to assess emissions of the pollutants from emission sources and their potential input to the marine environment.

This document summarizes the current situation regarding hazardous substances included in the BSAP. The document provides information on HELCOM and other international requirements of relevance to each substance and summarises the current level of development of the assessment system in the HELCOM community. The document also summarizes HELCOM commitments regarding hazardous substances and suggestions regarding the measures aimed at emission reduction.

Action required

The Meeting is invited to:

- consider the provided information and use it as appropriate;
- consider the sufficiency of the current assessment (e.g. frequency and completeness of the information on air deposition) of the environmental pressure caused by emission of hazardous substances for the purposes of the second holistic assessment;

- discuss and decide on needs in the assessment of emissions of particular pollutants, identifying possible sources of information;
- discuss and decide on updates of existing HELCOM Recommendations including the list of priority substances bearing in mind the new national and international regulation regarding their use and placement on the market;
- discuss and elaborate measures aimed at reduction of input of hazardous substances to the Baltic Sea which can be suggested for coordinated implementation in the HELCOM region.

Overview of the hazardous substances included in the BSAP

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1. Dioxins (PCDD), Furans (PCDF) and Dioxin-like Polychlorinated Biphenyls

Main sources

- Residential combustion
- Open burning of waste (backyard burning)
- Iron and steel industry
- Power production, non-ferrous metals, chemical industry.

International requirements

- Stockholm Convention on persistent organic pollutants (POPs)
- United Nations Economic Commission for Europe (UNECE) Protocol to the Convention on Long-Range Transboundary Air Pollution
- EU requirements (e.g. POP regulation 850/2004/EC, Dioxin strategy), see: http://ec.europa.eu/environment/pops/index_en.htm

HELCOM commitments

- Ministerial Declaration 2013 (MD2013)- to establish combustion efficiency requirements and/or emission limit values for dioxins according to HELCOM Recommendation 28E/8 by 2016 in order to minimize dioxin emissions from small-scale combustion sources as well as develop cost-efficient and BAT measures to large-scale industrial sources;
- HELCOM Recommendations: 31E/1 implementing HELCOM objectives, 27/1 Incineration of waste, 25/2 BAT in industry, 24/4 Iron and steel industry, 25/1 PCBs and PCTs, 14/3 Glass industry, 13/2 Industrial connections to municipal sewerage systems.

HELCOM assessments

Status	Pressure
Indicator development	
Core indicator <ul style="list-style-type: none"> • Polychlorinated biphenyls (PCB) and dioxins and furans <ul style="list-style-type: none"> - No agreed GES-boundary, to be developed by end of 2016 - Biota (fish) main matrix - Splitting into two indicators under consideration (PCB resp. dioxin) - PCB congeners included: CB-118, CB-153 	No core indicator agreed, thus no commonly agreed environmental target for a pressure level that reflects sustainable levels of human activities. Two Baltic Sea Environment Fact Sheets (BSEFS) available following trends only: <ul style="list-style-type: none"> • Atmospheric emissions of PCDD/Fs in the Baltic Sea region • Atmospheric deposition of PCDD/Fs on the Baltic Sea
Latest assessments and data source	
Core indicator <ul style="list-style-type: none"> • 2005-2010 based data evaluations available, however old targets. Sub-GES status largely indicated in these tentative results throughout the Baltic Sea. • HELCOM Monitoring Manual: sub-programme: Contaminants in biota 	BSEFS <ul style="list-style-type: none"> • 1990-2012 data published • Evaluated trend show a decrease of emission 41% and deposition 60%. • Assessed by EMEP, as the PCB and dioxin and furan are included in the Protocol on Persistent Organic Pollutants of CLRTAP

	<ul style="list-style-type: none">• Data on atmospheric emissions and deposition are annually provided by EMEP on the basis of annually updated contract
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Assessment of input and reduction measures

Assessment and data availability

As the substances are included in the Protocol on Persistent Organic Pollutants of CLRTAP and assessed by EMEP there is no need in additional measures to collect data on input to the Baltic Sea environment.

The frequency of input assessments is to be identified.

Measures

- In the residential sector - the replacement and retrofitting of household furnaces combined with generally improving building energy performance like thermal insulation;
- In industrial sector - technical measures with improved combustion and clean up techniques;
- To establish combustion efficiency requirements and/or emission limit values for dioxins;
- Improvement of BAT and revision of the BREF document concerning small particle (PM 2.5) emission reduction for different industry branches (power plants/energy sector, metallurgical sector, waste incineration)

2. Tributyltin compounds (TBT), Triphenyltin compounds (TPhT)

Main sources

- Used as an anti-fouling agent (main use)
- Used as a biocide
- Used as a pesticide
- Used as a marking agent in manufacture of aircraft
- Used as a fungicide in “regular” (non-anti-fouling) paints
- • Mono- and dibutyltin, which are used as stabilisers in e.g. PVC, polyurethane, polyester, can include TBT as impurity

International requirements

- Anti-fouling Convention (IMO): application of TBT banned since 2003, and coating of TBT required from 2008 (Convention enforced in September 2008)
- 2002/62/EC: prohibiting the marketing and use of organostannic compounds in antifouling systems for all ships, irrespective of their length.
- Regulation 782/2003: Antifouling use of organic tin compounds in all vessels banned in 2003. Old paint should be removed or permanently covered by 2008 at the latest. From 1 January 2008, ships bearing an active TBT coating on their hulls will no longer be allowed in Community ports.
- 98/8/EC: Biocide use of all organic tin compounds banned since autumn 2006
- 2455/2001/EC: identified as a priority hazardous substance under the Water Framework Directive

HELCOM commitments

- Recommendation 31E/1
- HELCOM Recommendations 20/4 Antifouling paints

HELCOM assessments

Status	Pressure
Indicator development	
Core indicator <ul style="list-style-type: none"> • TBT and imposex <ul style="list-style-type: none"> - No agreed GES-boundary, to be developed by end of 2016 - 	No core indicator agreed, thus no commonly agreed environmental target for a pressure level that reflects sustainable levels of human activities. No BSEFS
Latest assessments and data source	
Core indicator <ul style="list-style-type: none"> • Indicative assessments using other targets available for 2010 data, showing very variable concentrations over relative short distances • HELCOM Monitoring Manual: sub-programme: Contaminants in biota and in the sub-programme: Imposex. 	

Proposed conclusion regarding

Assessment and data availability

No data on inputs are available. Is there any need of data on inputs of the substances into marine environment, if their retail and use is banned in the Baltic Sea region?

Measures

No measures are required as the retail and use of the substance is banned since 2006.

3. Polybrominated Diphenyl ethers (PBDE); Pentabromodiphenyl ether (pentaBDE); Octabromodiphenyl ether (octaBDE); Decabromodiphenyl ether (decaBDE)

Main sources

- Used as a flame retardant in plastics used in electrical equipment such as computers (e.g. in electronic circuits)
- Used as a flame retardant in different textiles for special workwear (designed, e.g. to protect humans) and in special carpets.
- Used as a flame retardant in different products made of flexible polyurethane foam such as furniture, mattresses, automobile parts and packing material (main use)
- Used in resins to be used as a raw material for the above-mentioned plastic polymers.
- In addition to the atmospheric dispersion, PBDEs are introduced to the marine environment from waste and waste water treatment plants and via storm-water run-off.

International requirements

- Stockholm Convention on POPs: Pentabromodiphenyl ether is a new compound included into the protocol on POPs.
- Import of substances and products containing it to Russian Federation banned since 2010.
- 2003/11/EC and 2004/98/EC: Total ban since August 2004, prohibiting the placing on the market and the use of pentaBDE and octaBDE and the placing on the market of articles containing one or both of these substances.
- 2002/95/EC (RoHS Directive): from July 2006, new electrical and electronic equipment placed on the market are no longer allowed to contain PentaBDE
- 2002/96/EC (WEEE Directive): have to set up a collection scheme, proper treatment, recovery and disposal of waste electrical and electronic equipment (to be implemented by 13th August 2004)
- 2455/2001/EC: identified as a priority hazardous substance under the Water Framework Directive

HELCOM commitments

Recommendation 31E/1

HELCOM assessments

Status	Pressure
Indicator development	
Core indicator. The GES agreed. EQS _{biota human health} 0.0085 µg/kg ww	No pressure indicator agreed.
Latest assessments and data source	
Data are available and provisional evaluations show that the concentration of PBDE is high in fish in most areas in the Baltic Sea. The status of the sum of six BDE congeners in fish, bivalves and guillemot eggs during 2005–2010 shows that the boundary of Good Environmental Status is exceeded in almost every monitoring site in the Baltic Sea.	No input data available.

Conclusion regarding

Assessment and data availability

No input data available.

Measures to reduce input

- Controlled incineration,
- Substitution of PBDEs in polymers, textiles and construction materials,
- Urban run-off management.

4. Perfluorooctane sulfonate (PFOS), Perfluorooctanoic acid (PFOA)

Main sources

- Used as a surface-active agent in waxes and floor polishes
- Used as a dirt rejecter, friction control agent, surfactant and antistatic agent in photographic industry for manufacturing photo film, paper and plates and developing photos (main use and high emission factor to wastewater)
- Used in the semiconductor industry in photo-acid generators, antireflective coatings, etch mixtures and photo-resists (high emission factor to wastewater)
- Used as a surface-active agent in metal surface treatment in chromium baths used in, e.g. chromium plating (main use and high emission factor to wastewater). Important applications / final products are e.g. aircraft and vehicles
- Used in fire-fighting foams (high emission factor to wastewater)
- Used as a surfactant in industrial and household cleaning products
- Used as a flame retardant, corrosion inhibitor and surface-active agent in hydraulic fluids of both civil and military airplanes
- Used as a water and oil repellent in surface treatment (impregnation) of textiles and leather
- Used as a water and grease repellent in surface treatment (impregnation) of paper and cardboard (high emission factor to wastewater).

International requirements

- Stockholm convention on POPs: Chemical for preparation of risk management evaluations
- 2006/122/EC: Restrictions on the marketing and use; PFOS partly banned as a substance or constituent of preparations at concentration $\geq 0.005\%$ by mass and in semifinished products or articles $\geq 0.1\%$ by mass from 27th June 2008.
- Uses in the EU are restricted to:
 - Photoresist or anti reflective coatings for photolithography processes
 - Photographic coatings applied to films, papers or printing plates
 - *Mist suppressants for non-decorative hard chromium (VI) plating and wetting agents for use in controlled electroplating system
 - Hydraulic fluids for aviation
 - Fire fighting foams
 - Note! Fire-fighting foams placed on the market before 27 December 2006 could be used until 27 June 2011.
- Mostly substituted by voluntary agreement in USA, Canada and Europe. Restrictions on remaining (few) uses under discussion

HELCOM commitments

Recommendation 31E/1

HELCOM assessments

Status	Pressure
Indicator development	
Core indicator <ul style="list-style-type: none"> • Perflurooctane sulphonate (PFOS) <ul style="list-style-type: none"> - GES-boundary (equals WFD EQS_{biota} human health) agreed at HOD 48-2015 	No pressure indicators or trends
Latest assessments and data source	

Tentative evaluations for 2008-2013 using the newly established GES-boundary show GES-status in most Baltic Sea areas	No input data.
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Conclusion regarding

Assessment and data availability

No input data available.

Measures to reduce input

- Substitution of PFOS in metal (chromium) plating
- Substitution of PFOS/PFOA in semiconductor industry
- Substitution of PFOS/PFOA in photographic industry
- Improvement of BAT and revision of BREF document for metal surface treatment
- Advanced waste water treatment
- Treatment of industrial waste water (only PFOS)
- Advanced waste water treatment - AC treatment of municipal waste water MWWTPs (municipal waste water)
- Public awareness raising PFOS/PFOA
- Awareness raising for manufactures, industrial/commercial users

5. Hexabromocyclododecane (HBCDD)

Main sources

Used as a flame retardant in four principal product types:

1. Expandable Polystyrene (EPS, main use), which (as foam containing HBCDD) is further used in the building and construction industry in end products such as insulation panels / boards, car seats for children, rigid packaging material for fragile equipment, packaging material such as "chips" and shaped EPS-boards
2. Extruded Polystyrene (XPS, main use), which is further used, e.g. in rigid insulation panels/boards in the construction sector, insulation material against frost damage on road and railway embankments and sandwich constructions in, e.g. caravans and lorry platforms
3. High Impact Polystyrene (HIPS), which is further used in electrical and electronic appliances such as audio-visual equipment cabinets (video and stereo equipment), distribution boxes for electrical lines in the construction sector and refrigerator lining
4. Polymer dispersion for textile finishing (coating, significant source); textiles can be used for e.g. flat and pile upholstered furniture (residential and commercial furniture), upholstery seats in transportation, draperies, and wall coverings, bed mattress ticking, interior textiles, e.g. roller blinds, automobile interior textiles and car cushions

International requirements

- Stockholm convention on POPs: including into the protocol on POPs is under consideration.
- Regulation No 1907/2006. HBCDD is identified as a substance of very high concern (SVHC) and listed in Annex XIV as subject to authorisation.

HELCOM requirements:

Recommendation 31E/1

HELCOM assessments

Status	Pressure
Indicator development	
Core indicator GES-boundary (EQS biota human health 167 µg/kg ww) agreed at HOD 48-2015	No pressure indicators or trends
Latest assessments and data source	
Tentative evaluations for 2008-2013 using the newly established GES-boundary show GES-status in most Baltic Sea areas	No pressure indicators or trends.

Conclusion regarding

Assessment and data availability

No input data available. Preliminary assessment (COHIBA) based on the substance flow analyses shows that direct emissions (to land, air and surface waters) within the Baltic Sea region were in the approximate range of 300-700kg/year.

Measures to reduce input

- Substitution of HBCDD as a flame retardant
- Changing of product material
- Mechanical, chemical and biological waste water treatment (Industrial/municipal waste water)*
- Sludge treatment—thermal hydrolysis and anaerobic digestion
- Waste management
 - o controlled incineration
 - o controlled landfilling
 - o demolition of buildings.

6. Nonylphenols (NP) and Nonylphenol ethoxylates (NPE)

Main sources

- Industrial, professional and domestic (private) cleaning;
- Manufacture and use of cleaning products
- Paints; manufacture and use of paint products
- Textile industry in EU and textiles imported from outside of EU
- Metal industry; in metal cutting fluids and cleaning (NP and NPE, restricted use in metal cutting and metal cleaning
- Leather industry ☐ Municipal and industrial waste water and sludge
- Urban run off

International requirements

- 2455/2001/EC: identified as a priority hazardous substance under the Water Framework Directive.
- 2008/105/EC ("EQS Directive"), sets the water quality standards for nonylphenol in the EU.
- The use of nonylphenol and nonylphenol ethoxylates are restricted within the EU since 1.1.2005 due to Directive 2003/53/EC (currently REACH, Annex XVII).

HELCOM requirements

- Recommendation 31E/1
- HELCOM Recommendations 23/12 Textile, 23/7 Metal plating

HELCOM assessments

Status	Pressure
Indicator development	
Pre-core indicator "Estrogenic-like chemicals and effects". Due to estrogenic effect the compounds are included into the list of substances consisting the umbrella indicator.	No pressure indicators or trends
Latest assessments and data source	
Monitoring data are available for some of the included estrogenic like substances and effects from some areas of the Baltic Sea. No evaluation has been made yet as the concept is still under development.	No pressure indicators or trends

Conclusion regarding

Assessment and data availability

No input data available. Based on COHIBA outcome, industrial sources (about 75-80% of total NP/NPE emissions to environment) seem to be a much more significant source than urban sources (about 15-20% of total emissions to environment).

Measures to reduce input

- Substitution in cleaning, paints and textile industries;
- Ban of import of the textile articles containing the substances;

- Advanced municipal and industrial waste waters treatment including AC filtration, membrane filtration and oxidation technique;
- Sludge treatment- anaerobic and aerobic degradation
- Urban run-off management including collection and treatment.

7. Octylphenols (OP) and Octylphenol ethoxylates (OPE)

Main sources

The compounds are used for manufacturing car tyres and other rubber production, printing inks, electric isolation, textile, pesticide and marine paints hence sources include:

- Car tyres abrasion
- Emissions of OPE from washing of textiles
- Industrial waste water
- Municipals waste water.

International requirements

- 2455/2001/EC: identified as a priority substance under the Water Framework Directive
- EU Environmental Quality Standards (EQS) Directive (2008/105/EC)

HELCOM requirements

- Recommendation 31E/1
- HELCOM Recommendation 23/12 Textile

HELCOM assessments

Status	Pressure
Indicator development	
Pre-core indicator "Estrogenic-like chemicals and effects". Due to estrogenic effect the compounds are included into the list of substances consisting the umbrella indicator.	No pressure indicators or trends
Latest assessments and data source	
Monitoring data are available for some of the included estrogenic like substances and effects from some areas of the Baltic Sea. No evaluation has been made yet as the concept is still under development.	No pressure indicators or trends

Conclusion regarding

Assessment and data availability

No input data available. COHIBA project carried out substance flow analysis (SFA) for the Baltic Sea catchment area and estimated emissions between 18,000 kg/a in case of low emission scenario and 75,000 kg/a in case of high emission scenario. Emissions from abrasion of car tyres were considered as the dominating factor while emissions of OPE from washing of textile and the other pathways play minor role in total emissions.

Measures to reduce input

- Substitution of OP in textile printing
- Waste management - controlled incineration of waste tyres
- Voluntary agreement to stop using OP
- Advanced industrial waste water treatment – AC treatment
- Sludge treatment - controlled incineration.

8a. Short-chain chlorinated paraffins (SCCP or chloroalkanes, C10-13)

Main sources

- Used to manufacture textiles and clothing (designed e.g. for sailing and industrial work) with high flame-resistant, waterproof and anti-fungal properties
- Used as a greasing agent in leather finishing, further use in manufacture of leather products
- Used in metal-working fluids (both water- and oil-based) for treatment and coating of metal
- Used as lubricants in compressed air tools in garages and in different industrial sectors
- Used as a plasticiser and flame retardant in paints (used e.g. in road marking and as primer for surfaces exposed to seawater), varnishes and coatings
- Used as a plasticiser and flame retardant in rubber products such as gaskets, sealants and in glues used, e.g. in the construction sector and car industry
- MCCP (medium chained CPs, see 8b) can contain up to 1% SCCP
- The main sources of emissions of SCCPs in the past were their use in products, which has decreased due to regulations on the usage. According to outcomes of the COHIBA project the main sources are:
 - the use of products containing SCCP (emitted during their service life), contributing mainly to SCCP loads into wastewater;
 - sewerage, contributing mainly to SCCP loads into surface water bodies (via effluent) and onto land and soil (via sludge and waste remaining in the environment);
 - atmospheric deposition of uncertain origin.

International requirements

- Stockholm convention on POPs: Chemical for preparation of risk profile
- 2002/45/EC: Limitations on marketing and use; banned at metal working fluids and leather finishing at conc. > 1%
- 2455/2001/EC: identified as a priority hazardous substance under the Water Framework Directive
- In Russia - discharges to water bodies are banned; banned for discharge from ships, aircraft, man-made islands, plants and facilities in exclusive economic area.

HELCOM requirements

HELCOM Recommendations 31E/1, 17/8, 17/9, 16/4 Pulp industry, 16/7 Leather industry.

HELCOM assessments

Status	Pressure
Indicator development	
No status indicators or trends	No pressure indicators or trends
Latest assessments and data source	

Conclusion regarding

Assessment and data availability

No input data available.

Measures to reduce input

- Controlled waste management, targeting waste remaining in the environment as the dominant source, contributing to emissions to water and to land/soil;
- Advanced wastewater treatment, targeting emissions in wastewater from use of products;
- Additional (“minor”) measures for SCCP control:
 - o Sludge treatment, due to some emissions from wastewater treatment plants to land via sludge application;
 - o Ban on and substitution of SCCP in the remaining areas of application.

8b. Medium-chain chlorinated paraffins (MCCP or chloroalkanes, C14-17)

Main sources

- Used as a substitute for SCCP
- Used as a greasing agent in leather finishing
- Used in metal-working fluids (both water- and oil-based) in treatment and coating of metals
- Used as a plasticiser and flame retardant in paints (used e.g. in road marking and as primer for surfaces exposed to sea water), varnishes and coatings
- Used as a plasticiser and flame retardant in rubber products such as gaskets and in glues used, e.g. in the construction sector and car industry
- Used in some carbon copy paper types
- Used as a plasticiser and flame retardant in PVC plastic and further use in manufacture of plastic products

The main sources of MCCPs into the environment are: production of MCCPs, use in metal cutting fluids and waste remaining in the environment.

International requirements

No regulations yet.

HELCOM requirements:

HELCOM Recommendation 31E/1

HELCOM assessments

Status	Pressure
Indicator development	
No status indicators or trends	No pressure indicators or trends
Latest assessments and data source	

Conclusion regarding

Assessment and data availability

No input data available.

Measures to reduce input

- Ban/restriction/regulation of MCCP for usage in metal cutting fluids,
- Proper waste handling/management and treatment,
- Advanced waste water treatment
- Possible additional measures are: Regulating use of MCCP in PVC products (rather minor source), and sludge treatment.

9. Endosulfan

Main sources

- Agricultural pesticide (main use)
- Possible use as a wood impregnation agent.

Due to long-range transport of endosulfan, atmospheric deposition constitutes 75% of inputs to the Baltic Sea. Emissions into water from municipal WWTPs and manufacture of food products contribute to the rest.

International requirements

Endosulfan is banned in 60 countries, including Denmark, Estonia, Finland, Germany, Latvia, Lithuania, Poland, Russia and Sweden.

- The Stockholm Convention: including into the protocol on POPs is under consideration
- 864/2005/EC: banned in EU (withdrawal of authorisation) in plant protection products since 2005, authorisation in Poland should expire not later than 31.12.07
- 2455/2001/EC: identified as a priority hazardous substance under the Water Framework Directive
- Directive 2008/105/EC, environmental quality standards (EQS) are set for endosulfan (AA-EQS: 0.005 and 0.0005µg/l for inland surface waters and other surface waters, respectively).

HELCOM requirements

HELCOM Recommendation 31E/1

HELCOM assessments

Status	Pressure
Indicator development	
No status indicators or trends	No pressure indicators or trends
Latest assessments and data source	

Conclusion regarding

Assessment and data availability

No input data available.

Measures to reduce input

- Ban and substitution of endosulfan
- Sludge treatment – controlled incineration
- Advanced waste water treatment – AC treatment
- Improvement of control and ban of contaminated foodstuff

10. Mercury

Main sources

- Dentistry (dental amalgams)
- Crematoria
- Batteries
- Measuring and control instruments (e.g. thermometers)
- Low-energy/fluorescent lamps
- Electronics
- Laboratory chemical and pharmaceuticals including preservatives in some vaccines
- Gold recovery
- Chlor-alkali industry
- Coating on paper or film in photographic applications
- Fossil fuel combustion in e.g. power plants
- Production of zinc and copper (Hg in raw material)
- Non-antifouling paints (use possible)
- Cosmetics
- Pesticide
- Marine antifouling paints
- Wood preservation
- Textile treatment

Waste incinerators are identified in the Minamata Convention as one of the major industrial sources of mercury emissions.

International requirements

- Long-Range Transboundary Air Pollution: Protocol on Heavy Metals, metal of the first priority.
- Minamata Convention on Mercury
- EU strategy and several other requirements for product control and production. There is an agreement on a ban on mercury in fever thermometers and measuring instruments for consumers use.
- 2002/95/EC (RoHS Directive) from July 2006 also prohibits mercury in new electrical and electronic equipment placed on the market with the exception of fluorescent lamps where maximum contents are specified for various types of lamps.
- 2455/2001/EC: identified as a priority hazardous substance under the Water Framework Directive

HELCOM requirements

- MD2013 - early ratification of the UNEP 2013 Minamata Convention on Mercury, as well as a quick start of the implementation of the Convention, taking into account existing and possibly updated HELCOM Recommendations limiting the use of mercury in products and processes
- HELCOM Recommendations 31E/1, 6/4 Dentistry, 24/4 Iron and steel industry, 14/5 Batteries, 27/11 Incineration of waste, 17/6 Fertilisers, 18/2 Offshore activities, 23/4 Light sources and electrical equipment, 23/6 Chlor-alkali industry, 23/7 Metal surface treatment, 23/11 Chemical industry & 23/12 Textile industry

HELCOM assessments

Status	Pressure
Indicator development	
Core indicator <ul style="list-style-type: none"> • Metals <ul style="list-style-type: none"> - GES-boundary (equals WFD EQS_{biota secondary poisoning}) agreed at HOD 48-2015 	No core indicator agreed, thus no commonly agreed environmental target for a pressure level that reflects sustainable levels of human activities. Two Baltic Sea Environment Fact Sheets (BSEFS) available following trends only: <ul style="list-style-type: none"> • Atmospheric emissions of heavy metals in the Baltic Sea region. • Atmospheric deposition of heavy metals on the Baltic Sea
Latest assessments and data source	
Core indicator <ul style="list-style-type: none"> • Tentative assessment results for 2006-2011 indicate concentrations close to the targets 	Monitored by EMEP <ul style="list-style-type: none"> • 1990-2012 data published • Evaluated trend show a decrease of emission 65% and deposition 23%. • Data on atmospheric emission and deposition are annually provided by EMEP on the basis of annually updated contract

[Conclusion regarding](#)**Assessment and data availability**

As the substances are included into the Protocol on Persistent Organic Pollutants of CLRTAP and assessed by EMEP there is no need in additional measures to collect data on air borne input to the Baltic Sea environment. Mercury is also obligatory parameter for water quality monitoring.

The frequency of assessment is to be identified.

Measures to reduce input

- Substitution of mercury in products and processes: Fuels in power plant and cement production, dental amalgam use, light sources, batteries, measuring equipment
- Improvement of BAT and revision of BREF for combustion power plants: Combustion of fossil fuels in power plants, industrial boilers and for combustion residential heating, nonferrous metal industries, cement production, chloralkali.
- Control emissions from crematories.
- Waste management, controlled incineration.

11. Cadmium

Main sources

- Stabiliser for PVC
- Pigment in plastics, glasses, ceramics, paints, papers and inks
- Electrode material in nickel-cadmium batteries
- Synthesis of other inorganic cadmium compounds
- Metal industry and metal ore roasting or sintering installations
- Production of ferrous and non-ferrous metals (zinc mining, lead and zinc refining, cadmium)
- Plating of metals i.e. protection of iron against corrosion
- Component for various alloys
- Solar cells
- Fossil fuel combustion in power plants
- Fertiliser (in P minerals used in the production of P-fertilisers)

International requirements

- Long-Range Transboundary Air Pollution: Protocol on Heavy Metals, metal of the first priority.
- Council Directive 91/338/EEC on the marketing and use of certain dangerous substances and preparations. The Directive prohibits of use cadmium-based pigments for colouring e.g. PVC, PUR, PET.
- Directive 2006/66/EC on batteries and accumulators and waste batteries and accumulators. Prohibition of the use portable batteries or accumulators, including those incorporated into appliances that contain more than 0.002 % of cadmium by weight.
- Directive 2000/53/EC on end of life vehicles ELV. Materials and components of vehicles put on the market after 1 July 2003 do not contain lead, mercury, cadmium or hexavalent chromium.
- 2002/95/EC (RoHS Directive) from July 2006 prohibits cadmium in new electrical and electronic equipment placed on the market with some exceptions. Chosen as indicator for objective 1 and objective 2
- 2455/2001/EC: identified as a priority hazardous substance under the Water Framework Directive.
- Directive 2010/75/EU of the European Parliament and of the Council 2010/75/EU of 24 November 2010 on industrial emissions

HELCOM requirements

- HELCOM Recommendations 31E/1, 24/4 Iron and steel industry, 14/5 Batteries, 27/11 Incineration of waste, 17/6 Fertilisers, 18/2 Offshore activities, 23/7 Metal surface treatment, 23/11 Chemical industry & 23/12 Textile industry.

HELCOM assessments

Status	Pressure
Indicator development	
Core indicator <ul style="list-style-type: none"> • Metals <ul style="list-style-type: none"> - GES-boundary (equals WFD EQS_{water}) agreed at HOD 48-2015 	No core indicator agreed, thus no commonly agreed environmental target for a pressure level that reflects sustainable levels of human activities. Two Baltic Sea Environment Fact Sheets (BSEFS) available following trends only:

	<ul style="list-style-type: none"> • Atmospheric emissions of heavy metals in the Baltic Sea region • Atmospheric deposition of heavy metals on the Baltic Sea
Latest assessments and data source	
<p>Core indicator</p> <ul style="list-style-type: none"> • Tentative results with data up to 2013 indicate sub-GES results for some datapoints 	<p>Monitored by EMEP.</p> <ul style="list-style-type: none"> • 1990-2012 data published • Evaluated trend show a decrease of emission 58% and deposition 53%. • Data on atmospheric emission and deposition are annually provided by EMEP on the basis of annually updated contract

Conclusion regarding

Assessment and data availability

As the substances are included into the Protocol on Persistent Organic Pollutants of CLRTAP and assessed by EMEP there is no need in additional measures to collect data on air born input to the Baltic Sea environment. Cadmium is also obligatory parameter for water quality monitoring.

The frequency of assessment is to be identified.

Measures to reduce input

- Improvement of BAT and revision of BREF document concerning industrial air abatement;
- Improvement of BAT and revision of BREF document concerning wastewater treatment;
- Replacement and Retro-fit of household heating furnaces;
- Waste management – recycling;
- Reduction of Cd content in fertilisers;
- Sustainable use of sewage sludge;
- Advanced waste water treatment - AC treatment;
- Raising public awareness - raising awareness among consumers on cadmium related product use and disposal;
- Treatment of contaminated soil.

WFD Priority Substances to be reported under EU MSFD as minimum requirements exceeding BSAP list

1. Anthracene
2. Carbon-tetrachloride
3. Di(2-ethylhexyl)phthalate (DEHP)
4. Hexachlorobenzene
5. Hexachlorobutadienne
6. Hexachlorocyclohexane
7. Pentachlorobenzene
8. Polyaromatic hydrocarbons (PAH)
9. Benzo(a)pyrene
10. Benzo(b)fluoranthene
11. Benzo(k)fluoranthene
12. Benzo(g,h,i)perylene
13. Indeno(1,2,3- cd)pyrene
14. Trifluralin
15. Dicofol
16. Quinoxifen
17. Heptachlor and heptachlor epoxide