

## Notes from the HELCOM ACTION workshop 4.2 - BSAP and MSFD measures to abate eutrophication, 12-13 February 2020, Gothenburg, Sweden

### Summary

In the workshop, the following issues and actions were identified relevant for HELCOM and the Contracting Parties for their future work:

1. Importance of quantifying annual NO<sub>x</sub> discharges from ship scrubbers (HELCOM Pressure and Maritime Working Groups)
2. Analyze the potential to reduce NH<sub>x</sub> emissions beyond the (limited) aims of the NEC Directive / Gothenburg Protocol (HELCOM Pressure and Agri groups)
3. Quantify and follow-up the effect of WFD Programmes of Measures (HELCOM Pressure group through PLC)
4. Clearly identify and address the gap between BSAP objectives and the WFD in MSFD Programmes of Measures (HELCOM Pressure group, PLC and Contracting Parties)
5. Note the intention of the EU Commission to assess MSFD Cycle 2 Programmes of Measures in a regional context (HELCOM Pressure group and Contracting Parties)
6. Nationally coordinate measures and evaluate effects of measures (quantitatively) undertaken under various policies (Nitrate directive, NEC, IED, urban WW directive, etc.) when developing PoM under MSFD (Contracting Parties)
7. Enhance cooperation with HELCOM in regard to assessment of progress towards nutrient input ceilings and utilizing the ceilings as environmental targets for coordination of measures under various policies (Contracting Parties)
8. Continue work on joint regional documentation of PoM for the next cycle of MSFD as a platform to exchange information and regionally coordinate measures to achieve BSAP targets (HELCOM)

### Part 1 Introduction and background

The HELCOM Baltic Sea Action Plan (BSAP), adopted by the Contracting Parties of the Helsinki Convention, is an ambitious joint strategic plan for improving the ecological status of the Baltic Sea. The goal of the BSAP is to achieve good environmental status (GES) of the Baltic Sea. For the HELCOM Contracting Parties that are also EU Member States, implementation of the BSAP is tightly linked with national programmes of measures under the EU Marine Strategy Framework Directive (MSFD). The target years for achieving good environmental status (GES) are very close for both policies: MSFD by 2020 and BSAP by 2021.

HELCOM has recently finalized the 'State of the Baltic Sea' report, an assessment report presenting the status of the Baltic Sea during 2011-2016 that can be used by EU Member States in their 2018



MSFD reporting of Article 8. The assessment shows that although nutrient inputs to the Baltic Sea have decreased, over 97% of the Baltic Sea area is still affected by eutrophication. It is unlikely that the nutrient inputs to the Baltic Sea will be reduced to reach the maximum allowable level in all sub-basins by 2020/2021.

The Baltic Sea Action Plan is currently being updated beyond 2021. Also, the progress on the Programme of Measures (PoMs) under the MSFD should be reported by EU Member States in 2019 and updated in 2022. MSFD is one of the key policies contributing to the implementation of the HELCOM BSAP and national measures implemented under this policy are to be sufficient to achieve the good environmental status of the Baltic Sea.

The HELCOM ACTION project will evaluate sufficiency of existing measures and the need for additional measures to reach GES in the Baltic Sea, thereby contributing to the implementation and update of Programme of Measures for EU Member States and of the HELCOM Baltic Sea Action Plan.

The workshop was attended by all HELCOM Contracting Parties as well as HELCOM Observer, Race for the Baltic. The list of participants is included as **Annex 1** and the programme of the workshop as **Annex 2**.

Philip Axe, Swedish Agency for Marine and Water Management, welcomed the participant to Gothenburg as the moderator of the workshop. The aim of the workshop was to discuss sufficiency of implemented and planned measures to achieve maximum allowable inputs of nutrients set by the HELCOM BSAP (ACTION project WP6) and share the experiences in implementing national programmes of measures to abate eutrophication from the 1<sup>st</sup> cycle of MSFD as well as plans for the 2<sup>nd</sup> cycle of EU MSFD with the goal to achieve good environmental status of the Baltic Sea.

### **Sufficiency of measures**

Heini Ahtiainen and Luke Dodd, HELCOM Secretariat, presented the progress of HELCOM sufficiency of measures analysis related to eutrophication (**Presentation 1**). The aim of the analysis is to assess whether existing measures are sufficient in achieving good environmental status and contribute to identifying needs for new actions as part of the update of the Baltic Sea Action Plan. The same approach is used for various topics including eutrophication. However, there is a lot more data on nutrient inputs than for many other pressures and the data collected in the HELCOM pollution load compilations will be utilized.

In the discussion that followed, it was clarified that the interactions between various components, e.g. the role of eutrophication affecting other state components, are included in the model. For eutrophication, there are pressure targets, i.e. nutrient reduction targets, and the aim of the analysis is to find out if those targets would be met with the current measures. There is also some qualitative modelling for the time lags planned to be made.

Regarding the time lags of the effect of measures, the measures that have been implemented and have no effect anymore are not considered. Only the measures that are implemented but their full impact is not visible yet are taken into account. The development of human activities, e.g. the developments of the agricultural sector, are considered as well.

In principle, the SOM model is for each sub-basin, but in many cases such a scale is not feasible due to lack of data. For nutrients, the model is utilizing the division into PLC sub-basins.

## **Preliminary assessment of nutrient input reduction by 2017**

Lars. M. Svendsen, Aarhus University, presented the preliminary assessment of nutrient input reduction by 2017 (**Presentation 2**). There has been good progress in reducing nutrient inputs but there are still three sub-basins that are over the maximum allowable inputs of nitrogen and phosphorus, and for one sub-basin, reaching the MAI is uncertain. The inputs of nutrients from individual countries to the sub-basins have varying trends (decreasing, stable or increasing). The sources of nutrient inputs are estimated every few years as part of the PLC work. The source apportionments show that point source inputs have decreased significantly since the nineties.

It was discussed that there are also reduction targets for non-HELCOM countries that are situated in the Baltic Sea catchment area. These countries have not been involved in the target setting but the targets are based on polluter pays principle. There is mostly bilateral cooperation with the HELCOM and non-HELCOM countries.

It was clarified that there is a revision ongoing regarding national input ceilings due to revised data. Currently there are only draft numbers available. The new input ceilings will be introduced as part of the updated BSAP.

During the discussion, concerns regarding the reduction of atmospheric nitrogen emission from shipping were expressed. If the nitrogen emissions are reduced by using scrubbers, it could possibly result in transfer from atmospheric nitrogen input to direct input to the sea. This is an issue that requires further investigation as well as cooperation between the HELCOM Pressure and Maritime groups.

## **Airborne nitrogen input reduction by 2030**

Michael Gauss, EMEP, presented perspectives of airborne nitrogen input reduction by 2030 based on modelling in the ENIREN-II project (**Presentation 3**). The aim was to find out, how large a reduction in N-deposition on the Baltic Sea can be achieved through the implementation of the Gothenburg Protocol/NEC Directive by 2030.

It is estimated that large reductions can be achieved in oxidized nitrogen deposition to the Baltic Sea thanks to emission reductions in all HELCOM countries, as well as other EU countries and reductions in emissions from international shipping. It was clarified that the UK has still been included as one of the EU countries in the calculations. Deposition of reduced nitrogen will be reduced by a smaller amount, but still substantially.

[Part 2 Sharing country experiences from MSFD 1<sup>st</sup> cycle, measures under WFD to support MSFD, progress towards MAI/CART and reflections on MSFD 2<sup>nd</sup> cycle](#)

## **Lithuania**

Nijole Remeikaite-Nikiene, Lithuanian Environmental Protection Agency, presented experiences from Lithuania on measures to reduce eutrophication in the Lithuanian inland and marine waters (**Presentation 4**). There are pilot projects, river restoration measures as well as measures to reduce nutrient inputs from agriculture, such as support for growing catch crops and developing methodology for fertilization plans. Also, feasibility studies are conducted, e.g. to analyze the possibilities of phytoplankton biomass collection in the waters of the Curonian Lagoon.

## Estonia

Peeter Ennet, Estonian Environment Agency, presented estimations of N and P loads from catchments using the EstModel (**Presentation 5**). The bottlenecks that have been identified in developing the modelling are the effectiveness of mitigation measures, retention and natural concentrations. In the discussion, it was pointed out that in modelling and planning the policies, there is need for more cooperation with the people that are working with inland waters and sea.

## Finland

Antti Räike, Finnish Environment Institute, presented the Finnish experiences (**Presentation 6**). Finland first looked into the possibility that the reductions of nutrient inputs from the WFD measures would be enough to reach the reduction targets to the sea. The modelling showed that the WFD measures would not be enough and thus eight new measures were included in the MSFD programme of measures, for example, gypsum application and increased nutrient recycling. The analysis of the new measures showed that they are still not enough to reach the targets. There is thus funding available for additional measures.

The role of forestry in nutrient loading was discussed. There are a lot of peatlands in Finland and some have been ditched for forestry purposes. According to recent studies, these peatlands could be an important source of nutrients especially in the catchment of the Bothnian Bay.

## Germany

Julian Mönnich, German Environment Agency, presented experiences from Germany (**Presentation 7**). All German WFD measures to reduce nutrient inputs were carried over and reported under MSFD. There were also new measures under MSFD such as promoting NO<sub>x</sub> reduction measures for ships. Process for the 2nd cycle of the MSFD has just started. Synopses of new HELCOM actions will be taken into account in the process.

## Latvia

Margita Bruzgo, Latvian Environment, Geology and Meteorology Center, presented Latvian experiences (**Presentation 8**). There has been good progress in reducing nutrient inputs from especially large wastewater treatment plants. Other measures include, for example, building or renovating drainage systems with environmentally friendly elements to reduce nutrient runoff from both agricultural and forest areas. However, there is lack of data on the effectiveness of the drainage measures. A new project LIFE GoodWater (2020-2027) will focus on implementation of the measures for the water bodies at risk of not achieving environmental objectives laid out in the RBMPs within the time limits determined by the WFD by implementation of supplementary measures.

## Poland

Przemysław Gruszecki, State Water Holding Polish Waters, presented the Polish experiences (**Presentation 9**). There has been a National Municipal Wastewater treatment programme that has included construction and modernization of collective sewage systems and treatment plants. Increasing the level of phosphorus removal in wastewater discharged from treatment plants is still an ongoing measure. Poland has also a new approach for implementation of the Nitrates Directive and the measures apply for the whole country and not only designated areas. The effects of the new nitrates action plan will be followed up with the HELCOM pollution load compilations, pressure

analysis according to WFD for each water body and water quality monitoring. The monitoring results for 2019 are expected in September 2020.

## Sweden

Philip Axe, Swedish Agency for Marine and Water Management, presented the Swedish experiences (**Presentation 10**). In the MSFD programme of measures, Sweden is focusing on sea-based measures such as assessing the possibility to influence the internal load of nutrients and stimulating aquaculture techniques that do not result in net inputs. The Swedish experience is that internal load measures are accepted where appropriate in fresh and coastal waters. However, they are dependent on upstream measures being in place to reduce the external load. Also, the sustainability of sea-based measures is still uncertain.

## EU Commission

Jacques Delsalle, EU Commission DG Environment, presented the experiences from MSFD 1st cycle and reflections on 2nd cycle (**Presentation 11**). In their reporting, all Member States referred to measures taken in RBMPs to achieve compliance with WFD good environmental status. Some Member States also included more specific measures in their marine strategies. It was a problem that information on the effectiveness of measures is lacking in the country reports. The aim of the BLUE2 project (2017-2019) was to model the impacts N and P abatement measures on marine ecosystems. BLUE2 was a first attempt in modelling this and the work will continue in a new project. The Baltic Sea region has conducted a lot of modelling and scenario work that can be utilized also in the EU level.

## Part 3 Discussion on new measures to reduce eutrophication

Jens Kjerulf Petersen, BONUS OPTIMUS project presented the results of the project investigating mussel mitigation farming (**Presentation 12**). The project found out that mussels can be produced in most Western Baltic waters. The potential for N removal depends on salinity, phytoplankton, cultivation technique, and water depth. Mussel cultivation provides also other ecosystem services in the form of better water quality and sustainable protein sources that can be used for food or feed. Challenges include sedimentation, site selection, social acceptance, and birds feeding on mussels.

It was discussed if contaminants can be an issue with mussel farming. For the test areas in the project, there have been no problems. This could be partly due to large growth rate of the mussels and low levels of contaminants in the water. The problem is potentially larger if the growth rate of the mussels is lower and if there are local sources of pollutants near the farm.

There are some candidate species of mussels that tolerate lower salinity that could be applicable for the Central Baltic, but the project is still finalizing the results on this. Zebra mussels might be an option, but they require different farming technique and processing.

Ing-Marie Gren, BONUS OPTIMUS project, presented the economic value of mussel farming for nutrient removal (**Presentation 13**). The calculations made in the project show that the potential economic value of mussel farming for nutrient removal is positive and can be high. If mussel farming was to be used as a measure to offset nutrient inputs from land, more focus would be needed on how to implement mussel farming regarding e.g. payment mode, monitoring and verification. In the USA, oyster farming will be used as an offset for point sources in Virginia and Maryland.



## Conclusions

The moderator concluded that the workshop has provided a lot of ideas for the Baltic Sea countries for their second cycle of MSFD. According to the presentations held, the countries are very dependent on the measures under WFD to reach MSFD targets. Yet, the targets of WFD are difficult to reach.

One main message from the workshop is that there is a need to increase the coordination of policies dealing with inland waters and sea and the cooperation among the people working with these policies. This cooperation should be also encouraged and increased within HELCOM.

The workshop also discussed the importance of the information on the effectiveness of measures to find out, if the planned measures are enough to reach the set targets. Also, the nitrogen emission reductions in shipping by using scrubbers, which could possibly result in transfer from atmospheric nitrogen input to direct input to the sea, is an issue that should be taken up in the future HELCOM work.



## Annex 1. List of participants

\*) online participation

Name	Representing	Organization	Email address
<b>Lars M. Svendsen</b>	Denmark	DCE - Danish Center for Environment and Energy, Aarhus University	lms@dce.au.dk
<b>Peeter Ennet</b>	Estonia	Estonian Environment Agency	Peeter.Ennet@envir.ee
<b>Jacques Delsalle</b>	European Union	EU Commission, DG ENV	jacques.delsalle@ec.europa.eu
<b>Antti Räike</b>	Finland	Finnish Environment Institute	antti.raike@ymparisto.fi
<b>Julian Mönnich</b>	Germany	German Environment Agency	julian.moennich@uba.de
<b>Ilga Kokorite</b>	Latvia	Latvian Environment, Geology and Meteorology Center	ilga.kokorite@lvgmc.lv
<b>Margita Bruzgo</b>	Latvia	Latvian Environment, Geology and Meteorology Center	margita.bruzgo@lvgmc.lv
<b>Nijole Remeikaite *)</b>	Lithuania	Lithuanian Environmental Protection Agency	nijole.remeikaite@aaa.am.lt
<b>Przemysław Gruszecki *)</b>	Poland	State Water Holding Polish Waters	przemyslaw.gruszecki@wody.gov.pl
<b>Alicja Pecio</b>	Poland	Institute of Soil Science and Plant Cultivation - State Research Institute in Pulawy, Poland	alicja.pecio@iung.pulawy.pl
<b>Joanna Milwicz vel Delach *)</b>	Poland	Ministry of Maritime Economy and Inland Navigation	joanna.milwicz@mgm.gov.pl
<b>Lars Sonesten</b>	Sweden	Swedish University of Agricultural Sciences	Lars.Sonesten@slu.se



<b>Philip Axe</b>	Sweden	Swedish Agency for Marine and Water Management	philip.axe@havochvatten.se
<b>Mikael Krysell *)</b>	Sweden	Swedish Agency for Marine and Water Management	mikael.krysell@havochvatten.se
<b>Linda Rydell</b>	Sweden	Swedish Agency for Marine and Water Management	Linda.rydell@havochvatten.se
<b>Peter Wiwen-Nilsson</b>	HELCOM Observer	Race for the Baltic	peter@raceforthebaltic.com
<b>Michael Gauss *)</b>	Invited guest	EMEP MSC-W	michael.gauss@met.no
<b>Bo Gustafsson</b>	Invited guest	BNI	bo.gustafsson@su.se
<b>Nardine Stybel *)</b>	Invited guest	EUCC - The Coastal Union Germany	stybel@eucc-d.de
<b>Ing-Marie Gren *)</b>	Invited guest	Swedish University of Agricultural Science	Ing-Marie.Gren@slu.se
<b>Jens Kjerulf Petersen *)</b>	Invited guest	DTU Aqua	jekjp@aqua.dtu.dk
<b>Dmitry Frank-Kamenetsky</b>	HELCOM Secretariat	HELCOM Secretariat	dmitry.frank-kamenetsky@helcom.fi
<b>Susanna Kaasinen</b>	HELCOM Secretariat	HELCOM Secretariat	susanna.kaasinen@helcom.fi
<b>Heini Ahtiainen *)</b>	HELCOM Secretariat	HELCOM Secretariat	Heini.ahtiainen@helcom.fi
<b>Luke Dodd *)</b>	HELCOM Secretariat	HELCOM Secretariat	Luke.dodd@helcom.fi

## Annex 2. Programme of the workshop

**12 March 2020**

**Moderator:** Philip Axe, Swedish Agency for Marine and Water Management

Time	Activity
13:00-14:30	<p>Welcome</p> <p><b>Part 1 Introduction and background</b></p> <p>Progress of HELCOM sufficiency of measures analysis related to eutrophication <i>Heini Ahtiainen/Luke Dodd, HELCOM Secretariat</i></p> <p>Preliminary assessment of nutrient reduction input by 2017 <i>Lars M. Svendsen, DCE, Aarhus University</i></p> <p>Perspectives of airborne nitrogen input reduction by 2030 <i>Michael Gauss, EMEP</i></p>
14:30 – 15:00	Coffee break
15:00 – 17:00	<p><b>Part 2 Sharing country experiences from MSFD 1<sup>st</sup> cycle, measures under WFD to support MSFD, progress towards MAI/CART and reflections on MSFD 2<sup>nd</sup> cycle</b></p> <p>Experiences from Lithuania <i>Nijole Remeikaite-Nikiene, Lithuanian Environmental Protection Agency</i></p> <p>Estimation of N and P loads from catchments using Estmodel <i>Peeter Ennet, Estonian Environment Agency</i></p> <p>Experiences from Finland <i>Antti Räike, Finnish Environment Institute</i></p> <p>Experiences from Germany <i>Julian Mönnich, German Environment Agency</i></p> <p>Experiences from Latvia <i>Margita Bruzgo, Latvian Environment, Geology and Meteorology Center</i></p>

**13 March 2020**

9:00 – 10:30	<p>Recap of the first day</p> <p>Sharing country experiences (<i>continues</i>)</p>
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	<p>Experiences from Poland <i>Przemysław Gruszecki, State Water Holding Polish Waters</i></p> <p>Experiences from Sweden <i>Philip Axe, Swedish Agency for Marine and Water Management</i></p> <p>Overview of the assessment of eutrophication-related measures under MSFD <i>Jacques Delsalle, European Commission, DG Environment</i></p>
10:30 – 11:00	Coffee break
11:00 - 12:30	<p><b>Part 3 Discussion on new measures to reduce eutrophication</b></p> <p>Scientific results on mussel mitigation aquaculture <i>Jens Kjerulf Petersen and Ing-Marie Gren, BONUS OPTIMUS project</i></p>
12:30 - 13:00	Conclusions