



Document title	Proposal for nutrient input reduction scheme on the HELCOM website
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Background

PRESSURE 11-2019 requested the Secretariat to make all information related to the HELCOM nutrient reduction scheme as well its update available on HELCOM website and to discuss the update of the structure of the relevant webpages at the next PLC-7 Project IG meeting.

A proposed structure of the HELCOM website segment related to nutrient input reduction scheme would consist of the following sections/pages:

1. Front page with a brief introduction of the HELCOM Nutrient Input Reduction Scheme;
2. Targets. The webpage contains information on the existing HELCOM nutrient input related targets and links to scientific publications justifying their setting;
3. Progress towards Maximum Allowable Inputs. The webpage gives the key message from HELCOM core pressure indicator on input of nutrients, provides links to the full text of the indicator and assessment dataset;
4. Progress towards National nutrient input ceilings. The section contains a brief introduction to the system to follow up the progress, the latest results of the follow-up assessment, and a number of webpages specifying methodological and technical aspects of the follow-up. A proposed structure of the webpages is annexed to the document.

Action requested

The Meeting is invited to:

- consider the proposed structure of the section devoted to the HELCOM nutrient input reduction scheme at the HELCOM website;
- discuss and agree on the structure of the webpages;
- review the proposed text or agree on the procedure to revise the proposed text;
- discuss and agree on the contents of the sub-pages: “Uncertainties of the assessment” and “Data on long-term changes in inputs”;
- agree on the next steps to elaborate text for publication on the HELCOM website including deadlines and responsibility for the particular parts of the text.

Annex 1.

Proposals for the structure of the sections to follow up the progress towards national nutrient input ceilings.

The annex presents a proposal for the content of the section illustrating [progress towards the nutrient input ceilings](#) on the HELCOM webpage. The section would consist of the following web pages:

- Introduction;
- Key message;
- Citation details;
- Follow-up concept with sub-pages;
- Results with sub-pages;
- References.

Content of the “[key message](#)” is approved by HELCOM 39-2018 and is not a subject of this document. “[Citation details](#)” have also been agreed as a part of the “key message”.

Introduction

The net nutrient input ceilings are an integral part of [the HELCOM nutrient reduction scheme](#). They indicate maximum allowable inputs of nutrients integrating waterborne (direct coastal point sources and discharges from rivers), airborne (atmospheric deposition from a country or a group of countries) and transboundary (input via rivers through another country) inputs for each country to each sub-basin.

The progress assessment is based on the evaluation of *nutrient net input reduction* towards to the *net input ceilings*.

The net input is an estimate of the amount of nutrients ending up in the Baltic Sea sub-basins coming from a particular country. The calculations integrate waterborne (direct coastal point sources and discharges from rivers), airborne (atmospheric deposition from a particular country or a group of countries) and transboundary (input via rivers through another country).

The net input ceiling is the maximum allowable amount of nutrients from a country to a sub-basin, assuring the good environmental status of the Sea in terms of eutrophication. The sum of *input ceilings* set for all countries to a specific sub-basin is equal to [the Maximum Allowable Input](#) for that sub-basin.

The fulfilling of the nutrient input ceilings was assessed using statistically estimated net nitrogen and phosphorus inputs from each country to the sub-basins in 2012, taking into account an estimated uncertainty on these inputs. The 2012 net **inputs** are compared with the corresponding nutrient input **ceilings** to assess the progress towards the targets. Statistical estimation uses a time series of normalized net inputs of nitrogen and phosphorus for the period 1995–2012.

Contents of the section.

The section [Key message](#) describes the still needed reductions to reach the HELCOM nutrient reduction targets set for a clean Baltic Sea. A description of the methodology used for the assessment can be found in section [Follow up concept](#). Detailed description of the assessment results is given in a dedicated sub-section of the section [results](#). The section contains tables with calculated net inputs of nutrients for the assessment year and assessment of progress towards national input ceilings. The section also integrates reference data, data on uncertainties obtained by the statistical procedures, data on inputs since 1995 and a description of how to account [extra reductions](#) into one sub-basin for the assessment of the reduction into the neighboring sub-basins. The webpage also contains a glossary of definitions and abbreviations used in the publication and references to the

The “follow up assessment concept” page

Introductory text

What are *net inputs* and *nutrient input ceilings*?

Net input is an estimate of the input to a Baltic Sea basin that is caused by sources within a particular country (or for atmospheric inputs in some cases a collection of countries). The waterborne net input is calculated as the sum of direct coastal point sources and rivers discharging into the Baltic Sea within the country, plus contribution (after estimated retention) via rivers discharging to the Baltic Sea in another country minus contributions to the inputs that can be attributed to upstream countries. The input of nitrogen through atmospheric deposition due to emissions in the country is added to the waterborne net inputs. For more information see page [Calculation of net inputs](#).

Nutrient input ceiling is the target net input for each (relevant) country and sub-basin combination. The sum of nutrient input ceilings for a sub-basin is equal to the Maximum Allowable Input for that basin. Nutrient input ceilings are calculated for all of seven sub-basins. For more information see page [Calculation of nutrient input ceiling](#).

Waterborne transboundary inputs were originally estimated from input measurements at the relevant borders taking into account retention in the downstream countries. This assessment considers transboundary inputs within relevant river basins and evaluate them against established respective input ceilings. For more information see page [Calculation of net inputs](#).

Reference inputs comprising of normalized waterborne and airborne inputs for the period 1997-2003 were agreed as basis values for the HELCOM nutrient input reduction scheme in 2013. For more information, see the [PLC-5.5 report](#) and the [summary report on development of MAI and CART](#). Since 2013 the data on inputs in reference period were revised primarily due to update of the data on airborne nitrogen deposition and improvement of the quality of data on transboundary loads. Thus, country-wise allocated reduction targets for nutrient agreed in 2013 occurred to be insufficient to achieve good environmental status of the Baltic Sea.

In the Ministerial declaration the reduction relative to this reference were agreed (CART), but in this assessment we rather use the equivalent nutrient input ceiling that is simply reference net input minus CART for a country and basin. For basins without reduction requirement a nutrient input ceiling can also be calculated. For more information see the section “[Results](#)” on [Calculation of nutrient input ceiling](#).

How the fulfilment of nutrient input ceiling is assessed

A time series of normalized net inputs of air- and waterborne input of nitrogen and phosphorus 1995-2014 have been established for all country by basin combination followed by a trend analysis. It is tested if there are significant decreases or increases in the inputs. Statistically significant changes are calculated and indicated as percentages change from 1995 to 2014. The statistically estimated net nitrogen and phosphorus inputs country by basin in 2014 taking into account the estimated uncertainty on these inputs are compared with the corresponding nutrient input ceilings. Fulfilment off the nutrient input ceilings are shown by colors. Hues of **red** indicate that the estimated net input in 2014 is higher than the nutrient input ceiling. **Grey** indicates that when taking into account uncertainty on the estimated net input in 2014 it can't be evaluated if the net input is lower than the nutrient input ceiling. **Green** indicates that the estimated net input in 2014 with high statistical certainty is lower than the nutrient input ceiling. For more information see the report [Statistical aspects in relation to Baltic Sea Pollution Load Compilation](#) and the section “[Results](#)” on [Calculation of fulfilment of nutrient input ceilings](#).

How was the dataset established?

A complete dataset with updated water- and airborne nitrogen and phosphorus inputs was established for 1995-2014 based on reported waterborne inputs to the Baltic Sea by Contracting Parties and calculation of

atmospheric deposition on Baltic Sea sub-basins by EMEP. The dataset has been quality assured, some data corrected and data gaps have been filled in to get a consistent and complete dataset, and this dataset has been approved by the Contracting Parties. For more information on how a complete dataset was established, see the [PLC-5.5 report](#) and documentation on how a complete PLC-5.5 dataset was obtained.

Airborne inputs have been climate normalized and waterborne inputs flow-normalized to create time-series with strongly reduced variability caused by annual weather and river flow variations (Reference: [Statistical aspects in relation to Baltic Sea Pollution Load Compilation](#)).

See also the section "[Results](#)" on [Uncertainty of the assessment](#).

Sub-pages of the "follow up concept" page are:

- [Calculation of net inputs](#) – explains composition of the net inputs including transboundary loads and normalization procedure;
- [Calculation of nutrient input ceilings](#) briefs on the principles of the national ceilings calculation and provides reference values;
- Accounting for extra reductions describes calculation methods and provides data on extra reduction of inputs achieved by countries as well as re-allocation of the extra reduction to the neighboring sub-basins. – [see the next section](#).

Accounting for extra reductions

In the Ministerial Declaration 2013 the Contracting Parties agreed that the countries can account for extra reductions, in proportion to the effect on a neighbouring basin with reduction targets, in reaching their Country Allocated Reduction Targets.

The Baltic Sea comprises of a series of connected basins, and changes in the environment will lead to changes in adjacent basins as well due to transport of nutrients between the basins. In simple terms, if the nutrient concentrations change in one basin it will cause changes in the nutrient transports to adjacent basins. The magnitude of the nutrient transport change will depend on the water exchange between the basins and concentration difference between the basins.

Practically, in case the nutrients input to a basin is lower than MAI (extra reduction), fluxes will increase to this basin. It causes improvement of the status in neighbouring basins either. This improvement can be quantified using coefficients called *equivalent reduction*. The equivalent reduction illustrates environmental effect in the basins neighbouring the one where extra reduction has been achieved. The equivalent reductions are given in the Tables 1 and 2.

Table 1: Equivalent reductions on phosphorus. The table should be read so that each row provides the necessary input reduction to the basins to the left to provide the equivalent environmental effect in the basins in the top row, e.g. 1.5 ton reduction to BS gives the same effect in the BP as 1 ton reduction directly to BP. NB! That the factors are valid on single basin pairs under condition that all other basins fulfil MAI.

	KT	DS	BP	BS	BB	GR	GF
KT	1	4.0	–	–	–	–	–
DS	0.8	1	3.2	–	–	–	–
BP	2.4	2.8	1	3.3	7.7	–	3.8
BS	3.8	4.6	1.5	1	2.6	–	5.8
BB	–	–	9.0	8.3	1	–	–
GR	3.6	4.3	1.6	4.8	–	1	6.5
GF	3.6	4.2	1.3	4.1	–	–	1

Table 2: Equivalent reductions on nitrogen. The table should be read so that each row provides the necessary input reduction to the basins to the left to provide the equivalent environmental effect in the basins in the top row, e.g. 1.3 ton reduction to GR gives the same effect in the BP as 1 ton reduction directly to BP. NB! That the factors are valid on single basin pairs under condition that all other basins fulfil MAI.

	KT	DS	BP	BS	BB	GR	GF
KT	1	7.3	–	–	–	–	–
DS	1.7	1	4.6	–	–	–	–
BP	–	–	1	–	–	–	–
BS	–	–	–	1	7.8	–	–
BB	–	–	–	1.1	1	–	–
GR	–	–	1.3	–	–	1	–
GF	–	–	4.0	–	–	–	1

Results

The webpage consists of a number of annexes. These annexes provide information on how the assessment of progress towards national input ceilings has been performed, further details of the assessment including tables and figures illustrating net inputs of nutrients from all country sub-basins and statistical analyses. They cover the following issues:

- [Calculation of the fulfilment of nutrient input ceilings](#) provides assessment data;
- Uncertainties of the assessment contains brief descriptions of statistical methods used in the assessment and uncertainty of the assessment data; - **to be prepared based on scientific report**;
- Data on changes in inputs since the reference period illustrates progress in nutrients input reduction achieved by countries since the references period; - **not relevant**
- Data on long term changes in inputs illustrates progress since 1995; - **content to be decided**.

References

This webpage contains references to the main publication forming scientific background for the HELCOM nutrient input reduction scheme and the follow-up methodology. The current list of references is at the [webpage](#).