



## Baltic Marine Environment Protection Commission

Project on Development of a HELCOM Pollution Load User System  
Helsinki, Finland, 26-27 February 2014

PLUS 5-2014, 2-2

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### Background

Following consideration and decisions of HELCOM MONAS 16/2012, HELCOM HOD 37/2012 and HELCOM LOAD 4/2012 modernization of the PLC database has started, for smoother and faster reporting by the Contracting States and improved access, quality and completeness of PLC data.

The recent outcome of the Heads of Delegation meeting on 6-7 February 2014 (HELCOM HOD 45-2014) considered matters related to HELCOM PLUS, in particular hosting of the new database:

- The Meeting considered the comments by Finland on the HELCOM PLUS progress, explaining the reasons for SYKE withdrawing from their offer to host the modernized PLC database in the future.
- The Meeting noted the urgency of the issue to decide on hosting the PLUS database as the work is progressing with finalizing the data model which will soon be ready for implementation so not to create a delay in the project implementation and timetable.

Based on the decisions from HELCOM HOD 45/2014, Sweden has offered to consider hosting the new PLC database with involvement of the Baltic Nest Institute (BNI).

HELCOM HOD 45-2014 has requested this workshop to consider the issue of hosting PLUS database and to prepare more specific information, including on economy side as a basis for the decision by the Heads of Delegation. This document contains some further information on the hosting solution as well as information on the revised budget for the project.

### Action required

The Meeting is invited to discuss any technical questions that may need to be addressed in relation to the PLUS database Hosting and Application Development in cooperation with BNI.

The Meeting might also wish to discuss the timetable of the project, in particular the need to establish the database in time for PLC-6 reporting.

## Hosting and Application Development Proposal for PLUS

### Introduction

HELCOM MONAS 16/2012, HELCOM HOD 37/2012 and HELCOM LOAD 4/2012 considered the need for modernization of the PLC database, stressing its benefits such as smoother and faster reporting by the Contracting States and improved access, quality and completeness of PLC data.

The HELCOM PLUS project aims to modernize the HELCOM waterborne pollution load compilation (PLC) database, and develop a web application to access the data. The new design changes implemented to the PLC Database would provide a more efficient data system both for reporting and retrieving data derived from pollution discharges into the Baltic Sea.

The PLC Database modernization will:

- Facilitate, optimize and harmonize national reporting (including INSPIRE);
- Improve the quality of the data within the PLC database and introduce a quality assurance and quality marking system;
- Provide better access to the latest available, approved data for decision-making purposes and for public users;
- Support more efficiently the implementation of the Baltic Sea Action Plan through relevant HELCOM assessment work;
- Support the implementation of the HELCOM Data and Information Strategy [being part of the Monitoring and Assessment Strategy \(its Attachment 2\)](#).

The PLC database is presently maintained and hosted by the Finnish Environment Institute, SYKE, acting as PLC Data Consultant. The current database is stored in MS Access, and all data entry, quality-checking, querying, retrieval and analysis of the data is carried out by the Data Manager.

The recent outcome of the Heads of Delegation meeting on 6-7 February 2014 (HELCOM HOD 45-2014) considered matters related to HELCOM PLUS, in particular hosting of the new database.

- The Meeting considered the comments by Finland on the HELCOM PLUS progress, explaining the reasons for SYKE withdrawing from their offer to host the modernized PLC database in the future.
- The Meeting noted the urgency of the issue to decide on hosting the PLUS database as the work is progressing with finalizing the data model which will soon be ready for implementation so not to create a delay in the project implementation and timetable.
- The Meeting welcomed a preliminary offer of Sweden to consider hosting the PLUS database, with involvement of BNI or other national agency. Sweden is invited to come back with further details at the Workshop of HELCOM PLUS project on 27-28 February 2014 in Helsinki.
- The Meeting took note that OSPAR RID database work draws on experience from PLUS work and the cooperation between the LOAD Chair and OSPAR colleagues is ongoing to make most of the ongoing regional databases developments to create synergies.
- The Meeting noted that the PLUS workshop will discuss the data model and specifications of the PLUS/LOAD database. The Meeting requested the workshop to consider the issue of hosting PLUS database and to prepare more specific information, including on economy side as a basis for the decision by the Heads of Delegation and requested the Secretariat to communicate with the Heads of Delegation accordingly.

### Scope and Approach

The new modernized PLC database will be designed and developed in Microsoft SQL (MS-SQL). A systematic migration process is being implemented to transform the existing Access database to MS-SQL. The process will ensure that the historical data is migrated according to the new database structure.

In addition to this, the modernization of the PLC database involves development of a web-based application for reporting, checking, visualizing and downloading the data for annual and periodic assessments. The application development will also implement a Quality Assurance (QA) system to ensure better quality and correctness of the PLC data.

### System Overview

The new modernized database will contain information about catchments, monitoring stations, point sources, and their respective loads, which are relevant for the scope of the PLC data (including also metadata relevant for assessments when available). The information will be shown in a user-friendly and comprehensible way. A clear specification of the data model will provide the needed information. The web application will provide a means for downloading the data (suggested solutions are Excel and XML files), i.e. an export functionality into a file created with a specific format (to be defined). In addition to the download, the data should be also visualized on the web interface through tables and/or different graphs, and later maps (linked to HELCOM GIS).

The Contracting Parties will be able to directly enter the data in the PLC database through the upload of predefined Excel files, or manually via user input (web interface). A reporting form will be developed (both for the file and manual input online), as well as an import mechanism able to parse the data from the uploaded files and insert them into the database.

A user management system will be developed for distinguishing between the different user roles and their respective user rights, delegated through the data manager, and/or a national administrator. It would also be beneficial to remind Contracting Parties automatically about the submission of the national data, when new datasets are expected to be reported.

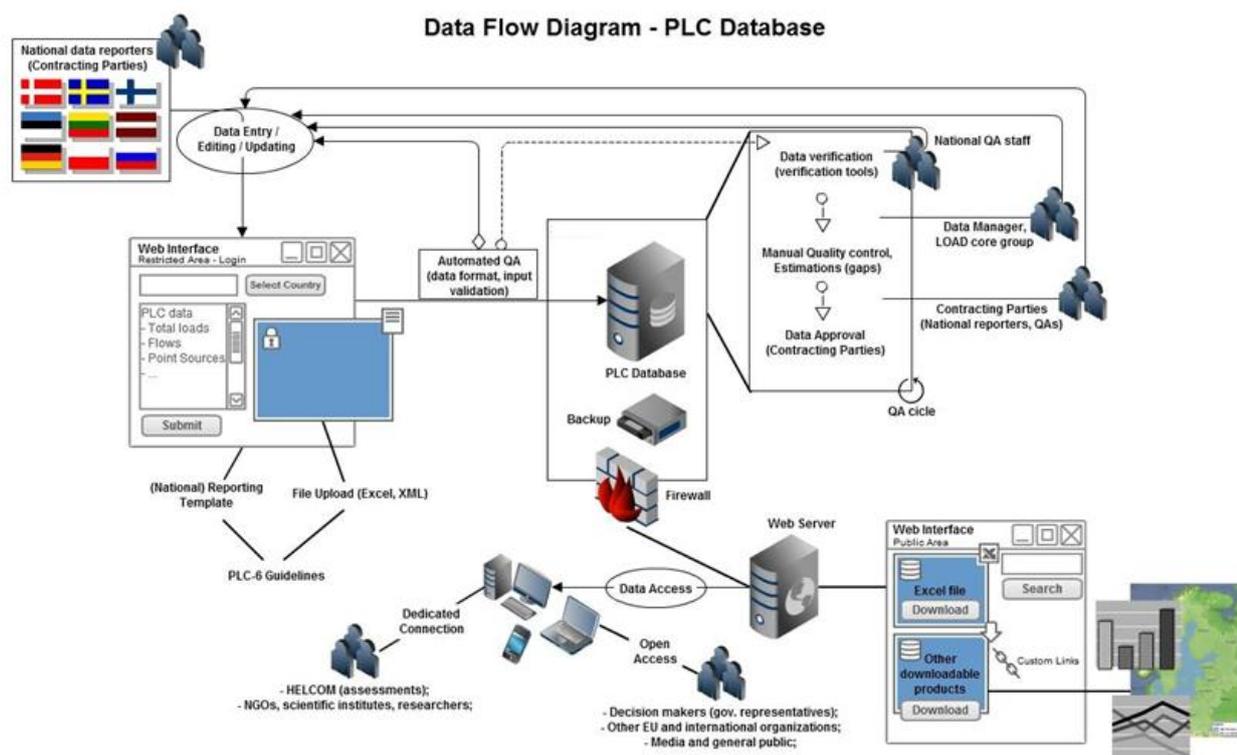
In addition, the data model and system architecture has been designed to support the implementations of a Quality Assurance process to verify the correctness and consistency of the data is of will be developed for improving the quality of the datasets, and as a consequence provide more precise assessments on the pollution load to the Baltic Sea.

The system also provides users with remote access to quality-assured data and related metadata. The users will also be able to generate reports, graphs, maps and using the application.

The system provides the users with access to older datasets for certain periodic assessments and also the most relevant data (e.g. loads, flows, point sources) with the highest completeness and correctness.

The database is being designed and modeled keeping in mind, possible cooperation and common solutions with OSPAR RID database project.

Shown below is the Data Flow Diagram for the PLC database



### Partnership for Database hosting and Application Development

The PLUS project plan/description has been developed together with PLC and database experts in the HELCOM Contracting Parties, e.g. via the HELCOM LOAD and PLC project contact networks. The Finnish Environment Institute (SYKE), as data consultant and host of the current PLC database (developed in MS Access) has played a central role during the development phases of the PLUS project and is the main responsible for developing the database and reporting templates (WP1, WP2 & WP3 (part 1), see Section 4.2 & 4.3) and the technical expertise, support and knowledge to the project for delivering work packages WP3 (Part 2)-WP5 (see section 4.3) is also needed, most of all knowledge and support related to implementation of web application derived from the work on the new data model. The necessary knowledge on the PLUS system from the current database host (SYKE) will need to be imparted to the new host.

The most critical aspect for the PLUS development is to finalize the hosting of the database and application development approach. This is necessary in order to ensure that the project is completed on time and the application is available for the periodic reporting of the PLC- data by the Contracting Parties.. In addition to providing hosting services, the new partner would need to provide development and maintenance support for the PLUS system in future. This includes developing new features, which would require changes to the database and Web Application. Based on the decisions from HELCOM HOD 45/2014, Sweden has offered to consider hosting the new PLC database with involvement of the Baltic Nest Institute (BNI) or other national agency

#### Approach Overview

Considering the hosting and application development criticalities, BNI of Sweden has expressed readiness to host the PLUS database, including the partnership whose expertise can be utilized for the development and future enhancements of PLUS. The database would be in MS-SQL. BNI is proposing to use Open Source technologies. The Application developed using Open source technologies can be integrated with any database including MS-SQL.

Other key aspects to be ensured are the cooperation between the Data Manager and BNI during development phase and for future work.

The project work is divided in different Work Packages. For more details on the work and time schedule, please see section 5.2.

## Project Status

### Revised Budget Status

The total budget, excluding WP 0 and WP 6, as planned earlier was estimated to 346.000€ (with in kind contribution by SYKE of 72.000€), divided between 22-28 man months.

There have been changes in the project: SYKE pulling out from the Web development and withdrawing their in kind contribution, and the application for funding from the Nordic Council of Ministers has not succeeded. The revised budget is presented below.

The revised budget and sourcing are as follows.

#### HELCOM PLUS budget

Originally planned budget (annex 2, HELCOM 34/2013) 346,000 €

SYKE in kind contribution for Web Development – 72,000 €

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Revised budget 274,000 EUR

| Estimated costs divided per roles within the project (WP 0 and WP 6 excluded) (man/months - €) |  |         |   |         |                               |         |  |         |       |          |
|--|--|---------|---|---------|-------------------------------|---------|--|---------|-------|----------|
| WP   | Project Manager (HELCOM) (revised)<br>(1 m/m = 4.000€) |         | Data Manager (SYKE)<br>(1 m/m = 9.000€) |         | ICT (SYKE)<br>(1 m/m = 9000€) |         | Web Development (revised)<br>(1 m/m = 4000€ - ...) |         | Total |          |
|  | m/m  | €       | m/m                                     | €       | m/m                           | €       | m/m  | €       | m/m   | €        |
| <b>Total:</b>  | 21   | 84.000€ | 5.75                                    | 52.000€ | 4.64                          | 42.000€ |  | 96.000€ | 48.4  | 274.000€ |

Previously agreed financing per source:

2012-2013 25,800 € - HELCOM budget

2013-2014 54,200 € - HELCOM budget

51,600 € - FI, SE, DK contributions

2014-2015 34,000 € - HELCOM budget

Financing that still needs to be secured:

108,400 € – originally planned to be covered by the NCM financing, but financing has not been granted - to be covered from the HELCOM budget (70,000 € distributed throughout three budget years – 13/14-14/15-15/16) and the Contracting Parties are requested to further contribute to the budget (38,400 €)

## Work Status

### Ongoing work

| Work Package and responsible | Activities   | Deliverable   |
|------------------------------|--|---|
| WP 1                         | <ul style="list-style-type: none"> <li>Data Model Development and Finalization</li> <li>Database Functional Design Specifications</li> </ul> | <ul style="list-style-type: none"> <li>Data Model</li> <li>Database Functional design document containing all the list of features implemented for first release of PLUS</li> </ul> |
| WP 2                         | <ul style="list-style-type: none"> <li>Migration and Testing of Database</li> </ul>  | <ul style="list-style-type: none"> <li>Migration document (details of migration approach) to new Database</li> <li>Fully tested and migrated Database</li> </ul>                    |

### Future Work

| Work Package  | Activities   | Deliverable   |
|---------------|--|---|
| WP 3 (Part 1) | <ul style="list-style-type: none"> <li>Development of Reporting template for PLC-6 Data Reporting</li> </ul>   | <ul style="list-style-type: none"> <li>Tested version of Template</li> <li>Documentation of new template requirements to PLC-6 guidelines document</li> </ul>                               |
| WP 3 (Part 2) | <ul style="list-style-type: none"> <li>Development of User requirement specification document for all functionalities in Release 1 (mock up screens for functionalities, List of QA checks to be done in the back end by the application). Pseudo code for application</li> <li>Development of first version of Web Application for Data Upload functionality</li> </ul> | <ul style="list-style-type: none"> <li>User Requirement Specification document</li> <li>First version of Web Application tested for upload functionality with reporting template</li> </ul> |
| WP 4          | <ul style="list-style-type: none"> <li>Development and Testing of QA process in the Application</li> <li>Development of functionalities related to data display, modification in the Web application</li> </ul>  | <ul style="list-style-type: none"> <li>Tested Web application with QA and data read / modify functionalities listed in the Requirement Specification document</li> </ul>                    |
| WP 5          | <ul style="list-style-type: none"> <li>Development of Reports, Graphs and Tables</li> </ul>  | <ul style="list-style-type: none"> <li>Application with required Tables and Graphs</li> </ul>   |

#### Future Release related features

- Integration of PLUS with HELCOM map and data service
- Pending features from first release

### *Timeline*

The approximate time frame for the development of the PLUS application is listed below. Exact time frames will be evaluated by BNI after reviewing the Functional Specifications and Features required to be implemented.

The database migration is expected to complete by June 2014. The first version of the application with the upload functionality including the reporting template is expected to be ready by December 2014.

Comparing to the original timeline, some delay has been encountered with WP 1 and 2 (3 months) due to prolonged finalization of the PLC guidelines. In addition to this there could be some additional schedule changes due to delays in finalization of partner for hosting and Web Application development.

The database would still be ready for reporting purposes before the expected deadline of **October 2015**. However the exact schedule for features related to assessment viz. report, graph generation (WP 5) would be evaluated in cooperation with BNI.

## Roadmap for implementation of HELCOM PLUS project (last updated 20.2.2014)

| Legend:  |   | Design       | Implementation | Testing      |                                |              |              |              |                                |              |              |              |   |   |   |
|--|---|--------------|----------------|--------------|--------------------------------|--------------|--------------|--------------|--------------------------------|--------------|--------------|--------------|---|---|---|
| Task   | Jul-Sep 2012  | Oct-Dec 2012 | Jan-Mar 2013   | Apr-Jun 2013 | Jul-Sep 2013                   | Oct-Dec 2013 | Jan-Mar 2014 | Apr-Jun 2014 | Jul-Sep 2014                   | Oct-Dec 2014 | Jan-Mar 2015 | Apr-Jun 2015 |   |   |   |
|  | 1 <sup>st</sup> Financial Year  |              |                |              | 2 <sup>nd</sup> Financial Year |              |              |              | 3 <sup>rd</sup> Financial Year |              |              |              |   |   |   |
| <b>Preparation and restructuring of the Database</b>     |   |              |                |              |                                |              |              |              |                                |              |              |              |   |   |   |
| WP0  | Preparation - Requirement analysis and specification  | x            | x              | x            | x                              |              |              |              |                                |              |              |              |   |   |   |
|  | Contracting Project Database Expert   |              | x              |              |                                |              |              |              |                                |              |              |              |   |   |   |
| WP1  | Specification of the data model and detailed functional requirements  |              |                | x            | x                              |              | x            | x            | x                              |              |              |              |   |   |   |
| WP2  | Implement the new data model (restructuring of the database and transfer of data)   |              |                |              |                                |              | x            | x            | x                              | x            |              |              |   |   |   |
| <b>Web Application – Reporting and Quality Assurance</b> |   |              |                |              |                                |              |              |              |                                |              |              |              |   |   |   |
| WP3  | Review of data reporting form (content and design)  |              |                |              |                                |              |              |              |                                |              | x            | x            | x |   |   |
| WP3  | Design of Web application functional requirements. First version of restricted web application for reporting and quality assurance of national data |              |                |              |                                |              |              |              | x                              | x            | x            | x            |   |   |   |
| WP4  | Set up of a quality assurance system for data reporting   |              |                |              |                                |              | x            |              |                                | x            | x            | x            | x |   |   |
| <b>Web Application – Access and Visualization</b>        |   |              |                |              |                                |              |              |              |                                |              |              |              |   |   |   |
| WP4  | Operationalization of web application for reporting and quality checking national data  |              |                |              |                                |              |              |              |                                |              | x            | x            | x | x | x |
| WP5  | Set up a public web application for users to view, graphically display and download data  |              |                |              |                                |              |              |              |                                |              | x            | x            | x | x |   |