

Status box

Title: Discussion document on Knowledge Base on Water Resources as follow-up of the Blueprint

Version no.: 1

Date: 20 November 2012

Author: Jacques Delsalle

The present note describes briefly the process for the development of EU water accounts at sub-catchment level and the building of a hydro-economic model, takes stock of the consultation performed so far with SCG members and propose a set of next steps in the line of Blueprint proposals.

Circulation and received comments:

Initial ideas for this paper were discussed at the SCG Meeting on 8 November. Comments received were integrated into the paper.

Water Directors are invited to provide comment on this paper.

Contacts:

Jacques Delsalle [jacques.delsalle@ec.europa.eu]



1. INTRODUCTION

Economic instruments, policy integration and governance cannot be effective without an adequate knowledge base enabling the right decisions to be taken at all levels:

- **Water balances** and adequate water allocation including the basic needs for nature i.e. the **ecological flows** are poorly implemented at river basin level. This is both a water quantity and quality problem since good water status cannot be achieved without adequate water allocation. This is often due to lack of capacity and/or awareness.
- The most crucial knowledge gap evidenced by the assessment of the plans and the studies supporting the Blueprint relates to the poor quality of the assessment of **costs and benefits** of water related measures and plans and programmes affecting water resources (or of lack of action), which are not properly understood or quantified. This also prevents the further implementation of economic instruments for water resources management, notably pricing schemes and payments for ecosystem services.
- Finally, there is insufficient **dissemination and sharing of compatible data** and other information between Member States, European bodies and third countries leading to an incomplete understanding and quantification of the problems Europe's waters are facing and, potentially, to incoherent water management choices.

In the preparation of the Blueprint the Commission has started a number of activities for the development of EU **water accounts** at sub-catchment level, for the assessment of **ecological flows** and for the building of a hydro-economic model that can support the assessment of policy scenarios and the formulation of **targets** for water efficiency and reduction of vulnerability. For the analysis of **costs and benefits**, the above-mentioned hydro-economic modelling, the database of measures developed in the context of the Blueprint, as well as other developed in the current policy context, initiatives at a wider scale such as the mapping of ecosystem services, that could contribute to some improvement in the knowledge base, together with other initiatives at Member State level.

The Blueprint includes in its operational objectives:

- (1) **Fully integrate water quality, quantity and hydromorphology concerns in water management.** This implies that water balances and the quantification of e-flows are available in all catchments within the next two years to assist in developing the 2nd round of RBMPs, that should include water allocation targets.
- (2) **Improving knowledge and tools available to water managers, enabling effective decision making and reducing administrative burden,** by improving

economic analysis and assessment of costs and benefits of reference scenarios and of the programme of measures in the 2nd round of RBMPs.

Both objectives are translated into proposals for adopting CIS guidances by 2014.

The present note describes briefly the process for the development of EU water accounts at sub-catchment level and the building of a hydro-economic model, takes stock of the consultation performed so far with SCG members and propose a set of next steps in the line of Blueprint proposals.

2. BUILDING OF WATER ACCOUNTS AT EU LEVEL

A service contract for the elaboration of physical water balances at sub-catchment level with monthly resolution, for developing water accounts based on UN SEEA-W methodology, was carried out by Pöyry for DG Environment, with technical support from the European Environmental Agency. The project demonstrates the benefits of building a consistent framework for physical water accounts at EU level with a high degree of geographical, temporal and sectoral accuracy, for the consistency of data collection, the development of water accounting methodologies and the assessment of water balance and water efficiency. It allowed the checking of the new Water Exploitation Index (WEI+) agreed by the Water Directors, and the improvement of water resource indicators.

The data collection and calculation was carried out in coordination with the collection of water quantity data by EEA. The water use data reported at EU level via various reporting streams can be reviewed and compared in WISE. However, the project also highlighted important gaps in the availability of key data and confirms the need to design a more cost-effective process for reporting as well as the need for statistics for the assessment of quantitative water resources. In addition, it demonstrates the need for further interaction between modelled and reported data.

A workshop took place on 7/9/2012 with experts nominated by Member States and SCG stakeholders. The main conclusions of this meeting are the following:

- There was no fundamental disagreement to the generic approach followed by DG ENV and the EEA. Nevertheless, a more active involvement of MS in technical details (such as the delineation of sub-catchment so that they correspond to management units) was required.
- The problems identified by the participants relate to concrete datasets and could be solved by bilateral coordination with the member states and sectoral experts to clarify the interpretation of the used data and to look for a way forward for concrete contributions from Member States or stakeholders covering missing data. Uncertainties remain very high and it is not clear to what extent these uncertainties have an influence on the results.
- There were therefore concerns expressed on the potential publication of maps, in particular WEI / WEI+ maps, due to the lack of a large amount of data and the unclear interpretation of the used data.
- Finally, a better coordination with the work undertaken in the context of the CIS should be established, more specifically on the calculation of the WEI+, and the

forthcoming analysis and agreement upon the thresholds of the WEI+ and development of complementary indicators.

3. HYDRO-ECONOMIC MODELLING

A modelling environment has been developed by the JRC in the context of the Blueprint Impact Assessment to assess the effects of water retention measures, water savings measures, and nutrient reduction measures on several hydro-chemical indicators, such as the Water Exploitation Index, Environmental Flow indicators, N and P concentrations in rivers, the 50-year return period river discharge as an indicator for flooding, and economic losses due to water scarcity for the agricultural sector, the manufacturing-industry sector, the energy-production sector and the domestic sector. Also, potential flood damage of a 100-year return period flood has been used as an indicator.

The study shows that this modelling software environment can technically deliver optimum scenario combinations of packages of measures that improve various water quantity and water quality indicators, but that additional work is needed before final conclusions can be made about using the tool, especially in the areas of economic loss estimations, water prices and price-elasticity, and the implementation and maintenance costs of individual scenarios.

An ad-hoc group of experts was nominated by SCG Members and contributed to focusing the work of the JRC and DG ENV, and to improving the quality of the dataset and model equations by providing additional information. It also contributed to raising awareness on modelling activities at EU, national or sectoral level, paving the way for the further definition of an efficient integrated assessment strategy at different levels.

There was agreement amongst members that the model is on the forefront of the state of the art. Inclusion of priority substances should be envisaged, as well as of hydro-morphological and biological components, which seems necessary for several policy considerations. This requires previous improvements in terms of data provision and better definition of ecological flows. More data would be needed in order to properly perform a cost-effectiveness analysis of the measures; it would be necessary to consider that the cost and effectiveness of measures may be region-specific. The cost-benefit analysis needs to be enhanced to include important value categories (e.g. health benefits, provision of ecosystem services, external costs, etc.) currently left out.

It was recognized that the model is an useful tool for the Commission to obtain EU wide overview and identify differences between the different Member States/European regions about the effects of socio-economic scenarios and climate change, and to evaluate decisions on broad categories of measures, green economy options and funding instruments. As for the parallel work on water balances at sub-catchment scale, it seems there is a trade-off between homogeneity of the results at EU level and accuracy at local scale. This needs to be taken into account when using results and drawing policy conclusion at e.g. national or river basin scale.

Conceptually speaking, such a model which integrates water quantity, water quality (though only considering nutrients) and economic aspects is very interesting to elaborate RBMP. However, the model, at this stage of development, is not able to capture all the water-related specific issues in each basin, including those that affect water planning, for which river basin authorities may have other tools that better suit their policy needs, including the implementation of the WFD. The model can only partly/indirectly assess

some of the environmental objectives of the WFD (environmental discharge, nutrients) but is not able to make statements about the good ecological status even if the interdependence of water quantity and quality/ecology is better covered through the concept of e-flows.

The modelling framework, if sufficiently populated and validated, could be used by a Member State or a trans-boundary coordination body, in a subsidiary way, as a tool to explore some aspects of objective setting relating to combinations of measures.

The model could be considered as “third party” input for the assessment of the 2015 RBMP, as a starting point for discussion, and definitely not to prescribe the implementation of a specific measure in a specific basin. It is valuable to get a better idea about large scale interrelations, long-term developments and differences between different European regions and on that basis develop regionally differentiated water policies (e.g. in which regions should the EU and MS foster water saving policies?). It can be interesting to compare the chosen measures in the RBMP’s with the optimized scenarios in the EU model. If differences appear, causes for those differences can be examined. There could be a bidirectional learning process

Experts from two Member States provided a preliminary identification of models/datasets operational in their country that could be linked with the EU-wide model: A working group within the CIS, or a topic-wise modelling workshop could be interesting, where experts about different topics could give a presentation to discuss about the different approaches in the Member States. It would be helpful to use pilot basins in order to validate the whole process. There are also very strong links to be made with water accounts, water statistic preparation, EEA reporting and the reporting requirements of industries under European and Member State regulations. It is important to define and consistently use clear terminology for water use reporting. Regard should be had for streamlining water reporting and water use analysis to avoid unnecessary duplication of effort

4. NEXT STEPS:

The above discussion on water balances and hydro-economic modelling at EU level shows that both Blueprint deliveries are « prototypes » with limited dissemination, to be used as a basis for discussion and further improvement.

However, they have a clear role to play in CIS process in support to economic analysis and the assessment programmes of measures from an EU-wide perspective. This requires filling data gaps, adding functionalities and ensuring consistency with existing results and tools at national/river basin levels. The objective is to build a multi-scale assessment framework in the perspective of SEIS.

The European Commission and the EEA will therefore engage into a further development of both tools, as long as they are essential tool for building assessment capacity at EU level, in the context of the Resource Efficiency Roadmap.

However, as evidenced by the consultation, if these activities are not integrated under the Common Implementation Strategy and synergies are not found with similar initiatives at national or regional level, there is a risk of duplication and ineffectiveness. Moreover, if the current data gaps and inconsistencies are not solved with additional action, these tools will not be useful. **Action at EU level** is triggered not only by the need to ensure

consistency of water allocation mechanisms in transboundary basins and a level playing field in the implementation of the WFD, but also by the economies of scale and quality improvements that can be achieved by common methodologies and datasets.

The concrete actions foreseen in the short terms (December 2012 -March 2013) are:

- EEA to perform an assessment of possible support for data collection and analysis of current data flow and its suitability as regular data flows for the water balance process
- JRC to review options for further development of the modelling platform
- DG ENV to assess the contribution of current pilot studies in river basins.
- DG ENV to launching a service contract for Water Balances Phase II in April 2013, including new pilot studies
- DG ENV to launch a study for an EU database of power plants including detailed data on water use

The Ad-hoc expert groups for Blueprint Modeling and Water Accounts had a strong positive outcome on the process. It is suggested current ad-hoc groups are merged and hold discussions early 2013. It is essential more Member States are represented (currently 12 MS were not represented, and some MS represented did not contribute actively to the discussions), so that a better integration with national/RB water accounts and models is ensured.

On that basis, a detailed report describing the roadmap will be submitted to SCG for discussion and further approval by Water Directors. The report will be an annex to CIS work programme 2013-2015.

5. MEMBER STATES AND STAKEHOLDERS REPRESENTED IN THE AD-HOC WORKING GROUP MEETINGS ON MODELLING AND WATER BALANCE

Expert(s) nominated by:	Modelling	Water balances
Austria	X	X
Belgium	X	X
Denmark		X
Estonia	X	X
France	X	X
Germany	X	X
Hungary		X
Ireland		X
Italy	X	X
Romania		X
Slovenia		X
Spain	X	X
Sweden	X	X
The Netherlands		X
United Kingdom	X	X
Turkey	X	
Albania (Observer)	X	X
CEEP		X
CEFIC	X	
CONCAWE	X	
COPA-COGECA	X	X
ELO		X
EUREAU	X	X
Eurelectric	X	X
EWA		X
WMO		X
CIS-SPI process	X	