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EcoWater First Annual Meeting



The 1st EcoWater Annual Meeting was held at the facilities of the Mediterranean Agronomic Institute of Bari, Italy, on the 4th and 5th October 2012, and included consultations with the EcoWater External Advisory Board to evaluate project progress.

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The Gothenburg Workshop



The 3rd EcoWater Case Study workshop was held in Gothenburg, Sweden, on the 20th March 2013. The event, which was attended by 17 EcoWater participants and 7 local actors, aimed at discussing eco-efficiency indicators and technologies that can be assessed concerning the Volvo Automotive Case Study, and at identifying drivers and barriers towards technology uptake.

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The Training Meetings

The Training Meetings, organized by the National Technical University of Athens, served as an opportunity to familiarize the Case Study Leaders with the EcoWater Tools and to test the methodological approach developed, ensuring a homogenous approach among the different Case Studies.

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EcoWater Tools and Toolbox

Systemic eco-efficiency assessment can be addressed using the SEAT and EVAT Tools, integrated into the web-based EcoWater Toolbox.



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The Bari Workshop

The 2nd EcoWater Case Study workshop was held in Bari, Italy on the 3rd and 4th October 2012. Discussions of the event, which was attended by 21 EcoWater participants and 13 local actors, focused on eco-efficiency indicators and technologies that can be assessed in the Sinistra Ofanto Irrigation Scheme.



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The 1st Large-Scale Targeted Event

**AquaConSoil
Barcelona
2013**

The 1st Large Scale Targeted Event of the EcoWater Project was organized in Barcelona, Spain, in conjunction with the AquaConSoil

conference (16-19 April 2013). The main objective of the Event was to establish links with the scientific and research community. Through discussions with representatives of the scientific "eco-efficiency and eco-innovation" community, feedback was obtained on the Project approach and preliminary results on indicators and methods.

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Forthcoming EcoWater Events

Upcoming EcoWater events include the Industrial Case Studies workshops (dairy & textile industry and energy production) and the 2nd EcoWater Annual Meeting. The 2nd Large-Scale Targeted event will also be organized before the end of the 2nd year of the Project.

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EcoWater First Annual Meeting



The EcoWater First Annual Meeting Participants

The First Annual Meeting of EcoWater was held at the Mediterranean Agronomic Institute of Bari (CIHEAM-IAMB), Italy, on the 4th and 5th October 2012. It was attended by representatives of all Project Partners as well as members of the External Advisory Board.

The 1st day of the Meeting was framed around the Case Studies (Session 1). The objectives of the Session were to describe the progress since the Project Interim Meeting in Portugal, and briefly present the final system mapping. The session included individual Case

Study presentations by the corresponding Case Study Leaders, which described the open issues and specified the next steps for the Case Study development.

The first Session of the 2nd day (Session 2) was devoted to the framework for conceptual scenario development, and focused on the scope, procedure and expected output of scenario development. A preliminary example of scenario framing for the Danish dairy industry was presented, in order to fully outline the proposed methodology.

Session 3 focused on the progress made on the development of the two tools and the Toolbox since the Interim Meeting in Portugal, and on planning the forthcoming activities. The objectives of the Session were to present the SEAT & EVAT tools and the functional design of the EcoWater Toolbox, and to discuss the requirements for the modeling of the Case Study systems, based on the experience of Partners from the preliminary mapping of the corresponding systems. The meeting concluded with plenary discussions on the forthcoming dissemination activities and tasks.

FIRST EXTERNAL ADVISORY BOARD MEETING

In parallel with the First Annual Meeting, a Project-wide evaluation with the EcoWater External Advisory Board (EAB) was held during the 1st Annual Meeting. The Consortium-wide discussion focused on the overall progress of the Project and aimed at:

- Providing recommendations on enhancing the Project outputs already developed, to support the development of the EcoWater Case Studies and ensure their wider applicability;
- Critically reviewing EcoWater with regard to the current state-of-the-art, and developing recommendations for enhancing its impact and contribution;
- Identifying critical aspects that need to be addressed in the following six months, in order to ensure that the Project attains its envisaged results and outputs.



The First External Advisory Board Meeting

The EAB members pointed out that the heterogeneity in the Case Studies is appreciated, although this could eventually affect the development of the methodological framework. It was suggested to examine if the Case Studies can be viewed from a wider (sector-specific) perspective, to broaden the perspectives of the analysis, try to connect water sectors and make an



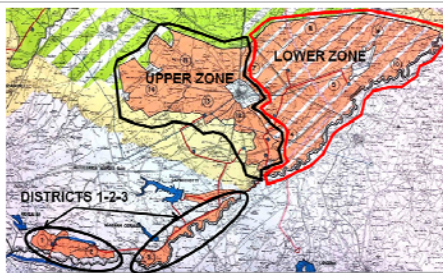
effort to generalize to the European level departing from the selected Case Studies.

The EAB members also suggested viewing the developed methodology and final outcomes from a wider scientific and policy perspective, bearing in mind that:

- The scientific community would be interested in a methodology for identification of eco-efficiency, the meso-level concept refinement in the water arena, toolbox development criteria and water system analysis and comparisons.
- The policy makers would be interested in eco-efficiency indicators values, realistic targets, benchmarks, scenarios and assessed technologies.
- The end users would be interested in evaluated technologies, eco-efficient ways to decrease pollutant load and improve their efficiency and assessment of potential synergies between water uses.

Finally, the interaction with other ongoing initiatives on eco-efficiency and eco-innovation and involving in the workshops associations / existing sectoral networks / producers-sellers-retailers of new technologies were encouraged.

THE BARI WORKSHOP



Irrigation districts of the Sinistra Ofanto Scheme

The second Case Study Workshop of EcoWater was organized in Bari, Italy on the 3rd and 4th October 2012. The event focused on the EcoWater Case Study on the Sinistra Ofanto Irrigation Scheme, in the framework of the 1st round of EcoWater Case Study events. The first day of the Workshop involved a field visit at the local office of the Consortium of Capitanata, the main water management body in the Sinistra Ofanto

area, and at the Coldiretti farmers' Cooperation. The former included a presentation on the scheme by representatives of the Consortium, focusing on the illustration of water management technologies that are currently used in the area, while the latter focused on olive and wine production processes and technologies.

The second day of the event was held at the Mediterranean Agronomic Institute of Bari (CIHEAM-IAMB) and was attended by representatives of all Project Partners and thirteen (13) local actors from the Water Authority and Wastewater service of the Apulia Region, the Consortium of Capitanata, the Ministry of Environment, the Ministry of Public Work (Apulia Region), the CNR Water Research Institute, the Bari University and the Politecnico of Bari.



Visit at the local office of the Consortium of Capitanata

A general presentation on EcoWater research context by Prof. D. Assimacopoulos, was followed by a presentation by Prof. M Todorović, who described the premises and the expected outcomes of the eco-efficiency assessment in agricultural water systems. Dr. D. D' Agostino presented the methodology for stakeholder analysis. Dr. L. Nardella focused on the description of the Sinistra Ofanto Scheme and provided data on water use for 2010 and 2011. Further information on the Scheme was provided by Mr. D. Zaccaria, emphasizing on the mapping of the different stages.

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Visit at the Coldiretti farmers' Cooperation

The discussion that followed the presentations focused on potential eco-efficiency indicators, i.e. the environmental and economic aspects that can be included in the analysis. The main environmental aspects considered were energy and water consumption, emissions to air, soil and water, and agricultural production inputs. With regard to the economic aspects, the most significant costs occurring in the Sinistra Ofanto irrigation scheme were highlighted.

Moreover, the discussion focused on water scarcity, which is the most significant problem of the area and leads to groundwater overexploitation. Reclaimed water was proposed as an alternative water source, which can reduce the specific problem. To that end, Prof. M. Todorović presented a preliminary list of technologies that can be assessed and described drivers and barriers that can affect their uptake.

The workshop concluded with a preliminary eco-efficiency assessment for the Sinistra Ofanto irrigation scheme, based on the Systemic Environmental Analysis Tool (SEAT) and the Economic Value chain Analysis Tool (EVAT), illustrating the follow-up research and data collection requirements. The current condition (BAU scenario) was compared to two alternative scenarios which included subsurface drip irrigation and regulated deficit irrigation.



The second day of the workshop

The Sinistra Ofanto Workshop provided significant information for the Case Study Development process. The most important conclusions from the event included the following:

- Local stakeholders are very interested in the objectives and anticipated results of the Project;
- The introduction of innovative technologies and practices to address water availability and environmental issues is extremely important for the successful operation of the scheme;
- Farmers should be informed on the new technologies and practices that will be assessed by the Project, to foster their uptake;
- Groundwater overexploitation is a major issue in the area and relevant information would be appreciated by the local stakeholders;
- Technologies regarding the monitoring of groundwater abstractions should be assessed, as groundwater is considered a scarce resource;
- The preliminary results shown were considered of significant importance by the local actors;
- Data collection regarding some aspects of the economic and environmental performance of the system might be challenging.



THE GOTHENBURG WORKSHOP



Volvo Trucks Operations site in Umeå

The 3rd EcoWater Case Study Workshop was held in Gothenburg on the 20th March 2013. The event focused on the EcoWater Case Study on the Volvo Automotive Industry, in the framework of the 1st round of EcoWater Case Study events. It was aimed mainly at initiating the collaboration between the EcoWater consortium and local actors in order to develop technology scenarios and to identify drivers and barriers for technology uptake in the Volvo Automotive Industry Case Study.

The Workshop was attended by representatives of all Project Partners and seven (7) local actors from Volvo Trucks (Gothenburg) and Volvo Technology, the Stena Recycling, Wastewater and Waste Treatment Company contracted by Volvo Trucks, and the Swedish Agency for Marine and Water Management (HaV).

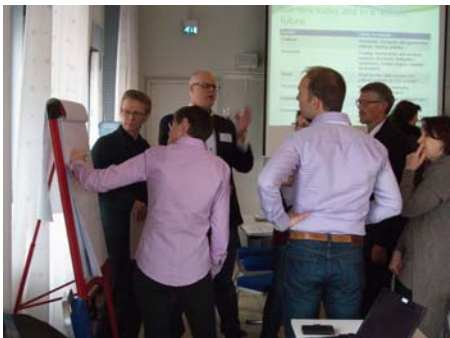
Mr N. Lindskog of Volvo Technology made a brief introduction to the Volvo Group and described water consuming processes in Volvo sites. Following that, Mr. U. Fortkamp of IVL Swedish Environmental Research Institute outlined the concepts of eco-efficiency and eco-innovation.



Discussion on innovative technologies

Ms. Å. Nilsson (IVL) focused on the description of baseline eco-efficiency assessment of the Volvo Case Study, providing calculated economic, environmental and eco-efficiency indicators. The presentation included a preliminary eco-efficiency assessment of a technology scenario and its comparison with the baseline scenario.

The described technology scenario concerned the replacement of traditional phosphating technology by a new silane-based technology and it was modeled in the Systemic Environmental Analysis Tool (SEAT) and the Economic Value chain Analysis Tool (EVAT). The discussion that followed focused on eco-efficiency indicators and innovative technology scenarios, with regard to which it was noted that an innovative technology implementation should benefit all the actors involved in the investigated system.



Break out Groups for the PESTLE exercise

Moreover, the importance of identifying drivers and barriers towards technology uptake was highlighted. To that end, Dr. P. Lindgaard-Jørgensen (DHI) introduced the PESTLE (Political, Economic, Social, Technological, Environmental, Legal) analysis method. The workshop ended with an exercise during which local actors and members of the EcoWater consortium tried to identify drivers and barriers for technology uptake

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concerning the industrial sector, based on the PESTLE analysis framework.

Overall, the third EcoWater Workshop was a successful forum for the dissemination of the project and its preliminary results to the local actors. The presence of Ms. Charlotta Stadig in particular, a representative of the Swedish Agency for Marine and Water Management (HaV), meant that the project could be disseminated on a wider level.

The most significant conclusions of the Volvo Workshop were:

- Local stakeholders have shown significant interest in the EcoWater concept and results; colleagues of the workshop participants also expressed their interest in being involved in similar EcoWater events;
- Further information on technologies would also be appreciated;
- The proposed silane based technology can potentially improve eco-efficiency of the Volvo water system;
- Water recycling is a promising option for improving the performance of water consuming production processes;
- The selected technologies should contribute to the improvement of the whole system and not only in the specific processes in which they are implemented;
- Case-specific indicators that take into account the potential drawbacks from the implementation of new technologies should be considered in the analysis;
- The consideration of the system as a whole and the organization of the different "players" of the system towards a common goal is of great importance.



FORTHCOMING WORKSHOPS



The next major EcoWater event is a local workshop dedicated to the Dairy industry Case Study, scheduled for September 2013 in Denmark. The event will focus on monitoring the Case Study progress, including baseline and technology scenario assessments, as well as on identifying drivers and barriers for technology uptake through discussion with local actors.

The Textile industry Case Study workshop has been scheduled for October 2013 in Biella, Italy.

The event programme will be announced in September 2013 through the EcoWater web site.

For further information, please contact:

Dr. Palle Lindegaard-Jorgensen, DHI (organizing institution): plj@dhigroup.com

Ms. Anna Balzarini, MITA (organizing institution): annabalzarini@skynet.be

Prof. Dionysis Assimacopoulos, NTUA (EcoWater Coordinator): assim@chemeng.ntua.gr



THE 1ST LARGE-SCALE TARGETED EVENT

AquaConSoil Barcelona 2013

The 1st Large Scale Targeted Event of the Project was organized in Barcelona, Spain, as part of the AquaConSoil conference (16-19 April 2013). It was aimed to maximize the usefulness and impact of the project results through the development of linkages and collaborations with the scientific and research community. The specific objective of the Event was to present the methodology, indicators and analytical tools that have been developed during the first year of the Project, and to discuss preliminary results with scientific peers (e.g. representatives of

the scientific "eco-efficiency and eco-innovation" community).

Invited speakers to the event included representatives of the United Nations Environment Programme, the ECO-INNOVERA network (a transnational cooperation aiming at promoting the development and implementation of Eco-Innovations in Europe), and other finalized as well as ongoing projects and initiatives on eco-efficiency and eco-innovation (ECOREG - The Eco-efficiency of Regions, EMInInn - Environmental Macro Indicators of Innovation, ETV - EU Environmental Technology Verification Pilot Programme).



The EcoWater session: 'how to achieve more with less'

The programme was framed around the basic concepts of the EcoWater research activities:

Meso-level and Eco-efficiency: How can they be defined and why are they important? Which is the policy relevance of the meso-level?

Meso-level Eco-efficiency Indicators: How can the most relevant indicators be selected? What do they depend on (meso-level, river basin, sector, technologies, etc.)? What do they assess? What are the best indicators for measuring meso-level eco-efficiency?

Technologies Assessment and Alternative Plausible Futures: Which issues should be addressed by the technologies? How do they lead to eco-efficiency improvement and to eco-innovation? Which are the drivers and the barriers that will affect their uptake?



Poster Session

The application of EcoWater methodology for assessing the Eco-efficiency of agricultural water systems was illustrated during the event, which was concluded with a hands-on demonstration of the tools and the toolbox developed in the EcoWater Project. All participants were invited to create their own demo case studies or work on existing ones, providing feedback for the further development and improvement of the tools.

The presentations of the event can be downloaded from the Project website: <http://environ.chemeng.ntua.gr/ecoWater/Default.aspx?t=256>

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LARGE-SCALE TARGETED EVENTS



The 2nd EcoWater Large-Scale Targeted event is tentatively planned to be organized in conjunction with the AQUATECH exhibition for process, drinking and waste water, in Amsterdam (5-8 November 2013). The event aims to foster linkages with the Industry Community representatives and to discuss the implications of different technologies in the (water) industry, based on available examples from the Project Case Studies. The event will be combined with the Amsterdam-Rhine Channel Case Study workshop, focusing on the cogeneration of electricity and the thermal energy, and the 2nd EcoWater Annual Meeting, which will also include consultation with the EcoWater External Advisory Board of experts, to evaluate project progress and outputs.

The 3rd Large-Scale Targeted Event of the Project, which aims to foster Science-Policy links, is tentatively planned to take place in Brussels, during Green

Week 2014. More information will become available at the Project website in due time.

For further information, please contact:

Mr. Michiel Blind, Deltares (organizing institution): michiel.blind@deltares.nl

Prof. Dionysis Assimacopoulos, NTUA (EcoWater Coordinator): assim@chemeng.ntua.gr

TRAINING MEETINGS ON ECOWATER TOOLS

Four training meetings on the EcoWater Tools were organized during January and February 2013 at the Multimedia Centre of the National Technical University of Athens, Greece. Each training meeting was attended by representatives of two Case Study Leaders and the NTUA, in an effort to:

- Familiarize the Case Study Leaders with the two modelling tools developed in EcoWater, the Systemic Environmental Analysis Tool (SEAT) and the Economic Value chain Analysis Tool (EVAT);
- Ensure a homogenous approach among Case Studies;
- Provide the basis for completing the Baseline eco-efficiency assessment of all the Case Studies, by finalizing the modelling of the corresponding systems and identifying any data gaps;
- Discuss expected results and how these can be presented; and
- Identify additional functionalities in the two modelling tools, which would be needed to address Case Study requirements.

The training sessions contributed towards the establishment of a homogeneous approach for the development of meso-level eco-efficiency indicators. Based on the training session discussions, it was decided that the appropriate metrics for measuring the environmental performance of water systems will be selected taking into account three different criteria:



- The relevance to the technologies to be implemented and assessed;
- The importance for supporting system-wide (meso-level) decisions (policy relevance); and
- The relevance to the environmental impacts of water use.

Furthermore, technologies implemented in specific stages of the water supply chain can be common for all the Case Studies and therefore, a common set of metrics on environmental performance could be developed, for the assessment of the technology performance, focusing particularly on main common environmental issues for all the studied systems:

- Depletion of non-renewable energy resources;
- Depletion and pollution of fresh water resources;
- GHG emissions and contribution to global warming.

A complementary set of indicators for assessing the remaining technologies, representing the specific characteristics of each Case Study, could be developed allowing a robust comparison between similar water use systems. During the training meetings all the Case Studies finalized the modelling of their respective systems in the two tools developed. Furthermore, the Case Study developers identified the additional functionalities that need to be added and the bugs that should be fixed for the further development of SEAT and EVAT, and the first prototype of the EcoWater Toolbox was tested among the participants.



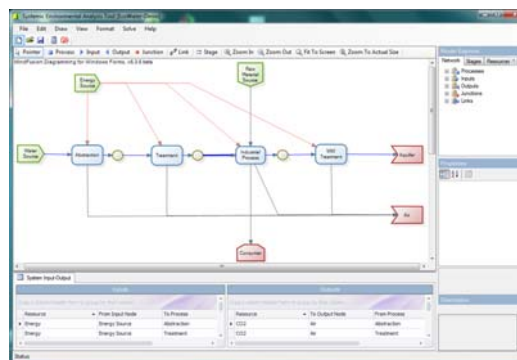
EcoWater Tools & TOOLBOX

The objective of the developed tools and toolbox is the application of the proposed methodological approach for the selection and evaluation of eco-efficiency indicators, suitable for assessing the system-wide eco-efficiency improvements (or deteriorations) from innovative technologies, applicable to different water systems and sectors of water use.

Systemic Environmental Analysis Tool (SEAT)

SEAT addresses the supply chain, its components, processes and interactions, and provides the flows of the materials (water, resources, products, etc.) that can be used for estimating the environmental components of the eco-efficiency indicators.

The supply chain is the physical representation of the various processes that are involved in producing goods (and services), starting with raw materials and ending with the delivered product. In the current concept, the water supply chain consists of various processes which modify the quality and/or the quantity of the water flow. It follows the actual flow of the water resource and can be described with physical quantities (i.e. kg, m³).



The SEAT interface – Mapping the Water Supply Chain

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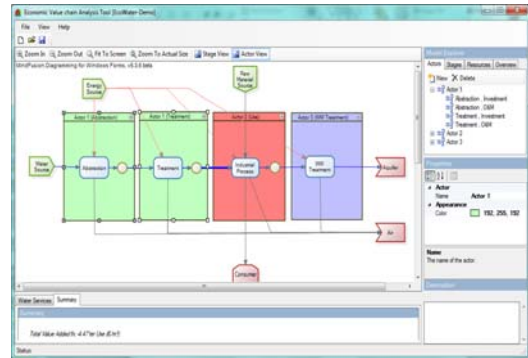
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Economic Value chain Analysis Tool (EVAT)

EVAT addresses the value chain, its actors and their interactions, and provides monetary flows that can be used to estimate the economic component of eco-efficiency indicators.

The value chain consists of the various actors, which are directly or indirectly involved in the water supply chain. Emphasis is placed on the role/function of the actors in the value chain. Each directly involved actor is responsible for the operation, maintenance and investment decisions for at least one stage, whereas indirectly involved actors, intervene through the setting of rules/standards, the offer of incentives, etc. The value chain monitors the added value to the final product, due to water use from stage to stage, and can be described using monetary quantities (i.e. €).



The EVAT interface – Mapping the Water Value Chain

System Requirements

Both SEAT and EVAT are Windows Applications developed with the Visual Basic .NET programming language. The software requirements are:

- a. Microsoft® Windows XP Service Pack 2 (32bit or 64bit), Microsoft® Windows Vista (32bit or 64bit) or Microsoft Windows 7 (32bit or 64bit) and
- b. NET framework 4.0.

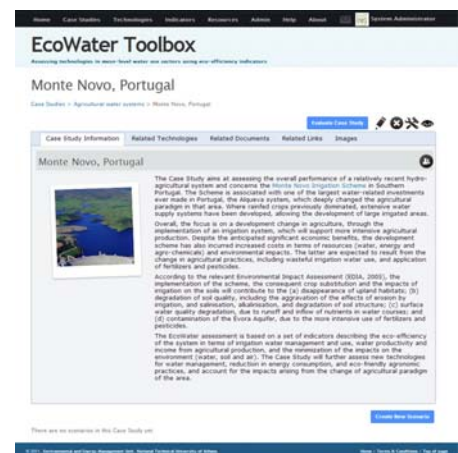
The EcoWater Toolbox

The EcoWater Toolbox is an integrated suite of on-line tools and resources for assessing the system-wide eco-efficiency improvements from innovative technologies, applicable to different water systems and sectors of water use.

It has been designed to support the step-by-step implementation of the EcoWater Methodological Framework:

Step 1. Case Study Framing

In this step, the definition of the system boundaries as well as the mapping and description of the water supply chain (stages, processes and existing technologies) and value chain (actors involved and their interrelations) take place.

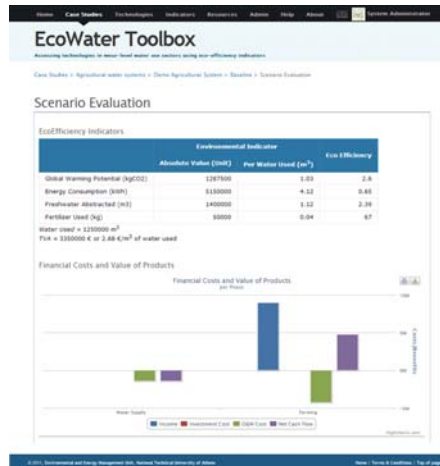


Step 1. Case Study Framing



Step 2. Baseline Eco-Efficiency Assessment

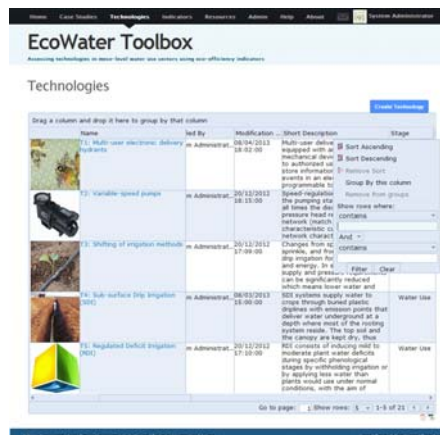
The water supply and value chains are modelled using the SEAT and EVAT tools respectively. In this step the environmental impact indicators, the total value added to the system from water use, the net economic output of all the involved actors, and the eco-efficiency indicators are estimated. This step supports the interpretation of the baseline eco-efficiency assessment results.



Step 2. Baseline Eco-Efficiency Assessment

Step 3. Identification of Technologies

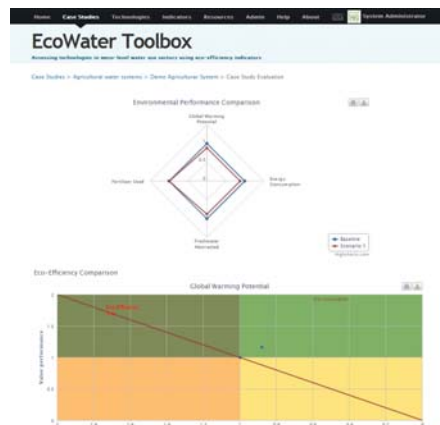
The toolbox integrates a technology inventory, with detailed information on the possible technologies/ practices for the eco-efficiency improvement of the water system. During this step, technologies can be selected from the inventory for implementation either throughout the water supply and wastewater treatment stages (common for all water use sectors) or within the water use processes (sector specific technologies).



Step 3. Identification of Technologies

Step 4. Technology Scenario Assessment

Each of the proposed technologies are modeled by identifying the parameters of the water supply and value chains that are affected by their implementation. The estimation of the eco-efficiency indicators can be repeated for each different technology or combination of technologies.



Step 4. Technology Scenario Assessment

The toolbox enables the assessment of innovative technologies by supporting the development of technology scenarios and providing tools for modeling the impacts on the water system from the technology implementation. Thus, it facilitates the comparison of technology scenarios to the baseline results.

The EcoWater Toolbox and the installers for the two modeling tools can be found at: <http://environ.chemeng.ntua.gr/ewtoolbox>

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RECENT EcoWATER RELEASES

The following EcoWater deliverables were developed from August 2012 to March 2013, and are publicly available in the Project Website:

- **Value Chain Mapping of the Agricultural Water Systems**

The deliverable presents the results of the first phase of development of the two Agricultural Case Studies, Sinistra Ofanto (Italy) and Monte Novo (Portugal). The value chain mapping of both systems has been completed through the definition of system boundaries, its main components and stages. The resource inputs and environmental impacts relevant to each stage (or process) of the system are explained, considering the costs and benefits for the system. In addition, a preliminary list of selected environmental impact indicators is presented and the actors involved in the different system stages and the interactions among them are identified. A preliminary list of potential technologies/practices that could be evaluated for each case has been also identified.

- **Value Chain Description of the Analysed Urban Water Systems**

The deliverable summarizes the results of the first phase of development of the two Urban Case Studies in the Canton of Zurich (Switzerland) and in Sofia (Bulgaria). The two CS areas are presented, followed by the mapping of both water systems and the description of each stage. The value chain mapping of each case was performed, including actors involved at the different stages, their roles and their interactions. A preliminary list of indicators is provided, relevant to the environmental impacts and the economic costs and benefits of each stage of the system, and a preliminary list of new technologies to be assessed is identified for both Case Studies.

- **Description of value chains for industrial water use**

The deliverable presents the results of the first phase of development of the Industrial Case Studies: textile industries in Biella (Italy), cogeneration of thermal energy and electricity in the Rhine Channel (Netherlands), dairy industry (Denmark), automotive industry (Sweden). The system boundaries of each case were identified and the mapping of water supply chain was performed including the description of stages, processes and technologies. The value chain mapping of each system was also performed and the actors involved at the different stages, their roles and their interactions have been identified. In addition, a preliminary list of potential technologies that could be assessed for each area was also identified.

- **Functional design of the meso-scale eco-efficiency toolbox**

The deliverable provides a description of the design and functionalities of the web-based toolbox, focusing on the different User Groups and the corresponding permissions for each group. The document provides preliminary information on the functionalities that may be included in the toolbox for each distinct step of the Case Study development process and some first screen mock-ups and narrative text on the functional design of the toolbox.