EcoWater

Meso-level eco-efficiency indicators to assess technologies and their uptake in water use sectors

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In the final issue of the EcoWater Newsletter

EcoWater Final Conference

The Final Conference of the EcoWater Project was held on October 16th 2014 in Portorož, Slovenia, within the framework of the 17th European Roundtable on Sustainable Consumption and Consumption and Production.

>>>Read more on Page 2

Roundtable on Policy Scenarios

The 3rd EcoWater Large Scale event "Roundtable Discussion on Policy Scenarios" was held on 10th December 2014 in Brussels, The event was organized in cooperation with the Eco-innovation Unit of European Commission's DG Research & Innovation.

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Participation in external events

The Project 3rd Large Scale event targeting policy makers combined both the stand-alone roundtable discussion held in Brussels, and the participation of EcoWater delegations in major events of relevant institutions/initiatives:

- The Water Innovation Europe 2014 meeting, which took place on 25-26 June in Brussels by WSSTP, the European Water Supply and Sanitation Technology Platform.
- The IWA World Water Congress & Exhibition, which took place in Lisbon (22-25 September 2014) .
- The Final Conference of the Eco-Innovera project, which took place in Copenhagen on the 17th—18th September 2014.

>>>Read more on Pages 2-3

The Zurich Workshop

The Waedenswil Urban Case Study Workshop took place on 19th of March 2014 in the Countryside Hotel on the peninsula Au, focusing on the baseline eco-efficiency results for the case study and the evaluation of technological and organisational options for the improvement of the system eco-efficiency.

>>>Read more on Page 10

The Sofia Workshop

The 4th EcoWater Case Study Workshop was held in Sofia on the 25th February in 2014, and focused on the assessment of eco-efficiency improvements through innovative technologies for potable water supply and waste water treatment.

>>>Read more on Page 11

Project Results

The main results of the eight EcoWater Case Studies are summarized, including environmental weaknesses & hotspots identified, technology scenarios examined, net economic output of involved actors and eco-efficiency indicator analysis.

>>>Read more on Pages 4-9

Project Closure

This is the final issue of the EcoWater Newsletter - thank you for following our Project over the past three years.

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DISSEMINATION ACTIVITIES

EcoWater Final Conference

The EcoWater project, aiming to achieve broad dissemination of its results, sought to combine its major dissemination events with relevant conferences, therefore addressing larger audiences compared to stand-alone project events. To that end, the Project Final event took place in conjunction with "The Europe we want" 17th European Roundtable on Sustainable Consumption and Production, on the 16th October 2014 in Portoroz, Slovenia.
The 17th ERSCP featured 136 abstracts accepted for oral presentation; in total, 12 oral presentations were contributed by EcoWater Project participants within the framework of the project Final Conference, several of which are being further developed into full papers. The abstracts and presentations are included in the EcoWater Conference proceedings (Deliverable 6.6).
The event also included the project's third Annual and External Advisory Board Meetings.

The EcoWater 3rd Large Scale event

The Project 3rd Large Scale event, targeting policy makers, combined both a stand-alone roundtable discussion held in Brussels, and the participation of EcoWater delegations in major events of relevant institutions/initiatives.

Roundtable Discussion on Policy Scenarios

On the 10th of December, the EcoWater team held a policy event in Brussels. Several representatives from industry and DG's attended the meeting. A summary of the project results was presented, in regard to policy issues, with input from the audience during the discussions. The event was concluded with a panel discussion on eco-efficient technology options and scenarios for water use systems and their policy implications.
The meeting provided insightful perspectives on the different challenges regarding policy and water. The invited panel consisted of Robbert Droop (Policy coordinator, Netherlands Ministry of Infrastructure and the Environment), Maria Giovanna Zamburlini (Environmental Policy Counsellor, Cefic) and Enrique Playan (Research Professor, CSIC).

IWA Conference and Exhibition

The IWA World Water Congress & Exhibition, which took place in Lisbon (22-25 September 2014) was selected as one of the venues for disseminating the results of EcoWater to representatives from the science, policy and industrial sectors.

The objective was to present to the audience of this large event, which brought together over 5,000 participants, representing every aspect of the water cycle from research to practice, how a systemic approach can identify new opportunities for innovation and new arguments for the development of more eco-efficient technologies.
The EcoWater project delegation was hosted at the Danish Pavilion, where project flyers and leaflets presenting the eight Case Studies and the most significant results were available. Visitors could also watch the EcoWater animated video, while the EcoWater team could pro-

vide the visitors with a live demonstration of the tools and the EcoWater toolbox.

Finally, EcoWater also participated at the "Business Forum: Non Revenue Water, intelligent water management and other Danish strongholds", organized by the Danish Water Technology Group, with a presentation focusing on the selected eco-efficiency indicators to assess technologies & their uptake in water use sectors.

Water Innovation Europe 2014

Eco-innovation today has a low impact on society and economy, so the challenge is not only for the water but for all sectors. Systemic eco-innovation needs to cope with environmental pressures and with resource scarcity, increase EU competitiveness and create new jobs.
The EcoWater project participated in a roundtable on systemic eco-innovation during the Water Innovation Europe 2014, the WssTP (European Water Supply and Sanitation Technology Platform) Annual Stakeholder Event, which took place on 25-26 June in Brussels.
The event focused on four strategic orientations:

- Systemic eco-innovation for a circular economy;
- Nature-based solutions;
- Climate services; and
- City blueprints for smarter cities and regions.

Palle Lindgaard-Jørgensen (DHI) presented the EcoWater project , focusing on the importance of the systemic approach adopted, the involvement of all stakeholders along the water value chain and on the assessment of both the economic value of the water use and the environmental impacts and resource use. In the discussions that followed, the EcoWater methodological approach and the developed tools were quoted as an important step in the direction of being able to model complex systems and interactions. WssTP members mentioned it as an approach which should be brought more into their own activities on systemic eco-innovation.

Eco-Innovera Final Conference

Members of the EcoWater consortium were invited to participate in the Final Conference of the Eco-Innovera project, which took place in Copenhagen on the 17th—18th September 2014.
The conference aimed to:

- Research for eco-innovation: How to build partnerships, develop technologies and deliver eco-innovation;
- Effective co-operation for eco-innovation: Highlighting key actions and successes;
- Building the case for future co-operation: Towards a shared vision for system innovation.

EcoWater was represented by Michiel Blind (Deltares) and Dionysis Assimacopoulos (NTUA), who moderated a roundtable on "Boosting Eco-Innovation through Cooperation in Research and Development" during the event. They presented the EcoWater project to the conference participants (project members of Eco-Innovera funded projects, ministries of research and/or ministries dealing with eco-innovation) and facilitated a discussion on selected issues/ questions stemming from the EcoWater project related to eco innovation.

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PROJECT RESULTS & OUTPUTS

Sinistra Ofanto Irrigation Scheme Case study, Italy

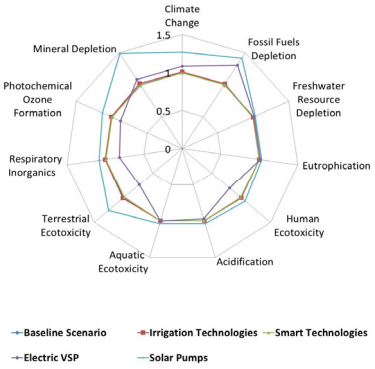
The environmental weaknesses/hotspots identified during the eco-efficiency performance assessment of the Sinistra Ofanto system are:

- Freshwater Resource Depletion due to irrigation and excessive depletion of aquifers;
- Climate Change impact due to emissions from fuel consumption and fertilizer; and
- Eutrophication of groundwater and surface water due to NO_3^- and PO_4^{3-} leaching.

Technology scenarios were formulated towards resource efficiency and pollution prevention to improve the eco-efficiency of the agricultural water use system.

Technology scenarios to improve eco-efficiency in Sinistra Ofanto

Technology Scenario	Technologies
...towards Resource Efficiency	Drip & sub-surface drip irrigation technology
	Smart technologies
...towards Pollution Prevention	Electric variable speed pumps (on field)
	Solar pumps (on field)



Spider chart for eco-efficiency assessment in the Sinistra Ofanto Case Study

In terms of environmental performance, the Electric Variable Speed Pumps increased the energy used by 47%, while the smart technologies were the only ones that reduced all the environmental indicators.

The analysis of net economic output reveals that only the irrigation technologies had a negative impact on the actors net economic output, and more specific on the Farmers Association 2.

An improvement in the eco-efficiency of the system was achieved through the implementation of the majority of technologies to the examined system.

Monte Novo Irrigation Scheme Case study, Portugal

Hotspots and environmental weaknesses identified in the analysis were:

- Freshwater Resource Depletion, due to high amount of water abstracted for irrigation;
- Eutrophication, due to the use of fertilizers (Nitrogen and Phosphorus); and
- Fossil Fuels Depletion, due to the energy production.

The table that follows outlines the technologies in the scenarios assessment for the agricultural water use system of Monte Novo.

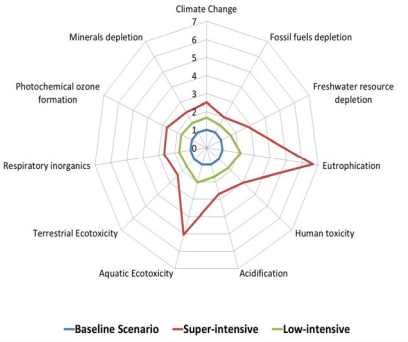
In terms of environmental performance, both super and low-intensive scenarios reduced all the three indicators, namely the water abstracted, the CO_2 emissions and the energy used.

The super-intensive scenario, as well as the low one, had a very positive effect on the net economic output of the involved actors (EDIA, AB Monte Novo and the farmers).

An improvement of eco-efficiency was achieved through the implementation of both technology scenarios to the examined system.

Technology scenarios to improve eco-efficiency in Monte Novo

Technology Scenario	Technologies
...towards Resource Efficiency	Regulated deficit irrigation
	Sub-surface drip irrigation (SDI)
...towards Pollution	Use of sludge
	Use of organic fertilizers
... other	New energy price



Spider chart for eco-efficiency assessment in the Monte Novo Case Study

Sofia Urban Water Supply System Case study, Bulgaria

Hotspots and environmental weaknesses identified in the analysis were:

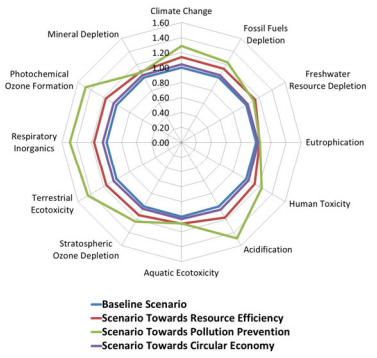
- Freshwater Resource Depletion, due to water losses in the water distribution network and extensive amount of water used in households;
- Climate Change and Fossil Fuel Depletion, due to sludge transportation; and
- Significant impact on most of the environmental categories, due to conventional energy production.

The table outlines the technologies in the scenarios assessment for the urban water use system of Sofia. All three scenarios reduce the environmental performance indicators. It should be also noted that the pollution prevention scenario improves significant all the examined indicators.

With respect to the net economic output, all the scenarios positively influence the domestic water users. However, the water operator appears to have a negative impact on its net economic output for all the implemented technology scenarios. The results of the eco-efficiency indicators (for baseline and technology scenarios) are presented in the spider chart.

Technology scenarios to improve eco-efficiency in Sofia

Technology Scenario	Technologies
...towards Resource	Water saving appliances
	Pressure reduction turbines
...towards Pollution Prevention	Water and energy saving appliances
	Drain water heat recovery
	Solar water heating
	Pressure reduction turbines
	Hydro power plant
...towards Circular Economy	Solar sludge drying
	Pressure reduction turbines
	Hydro power plant



Spider chart for eco-efficiency assessment in the Sofia water supply system

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Waedenswil Urban Water Supply System Case study, Switzerland

The environmental weaknesses/hotspots identified during the eco-efficiency performance assessment were the following:

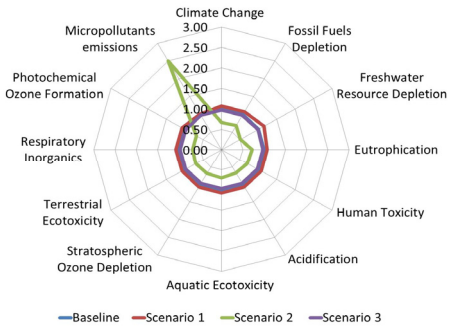
- Climate change and Fossil Fuel Depletion due to water heating with fossil resources such as gas and oil;
- No measures to reduce micropollutant emissions; and
- Freshwater Resource Depletion, due to water use in households.

The technology scenarios assessed for the Zurich Case Study are shown in the table.

Technology scenarios to improve eco-efficiency in Zurich

Technology Scenario	Technologies
...towards Resource Efficiency	Water saving appliances (warm water)
	Water saving appliances (cold water)
	Water reuse and recycling
...towards Pollution Prevention	Water saving appliances (warm water)
	Solar water heating
	Micropollutant removal
	Smart pumps
...towards Circular Economy	Water reuse and recycling
	Advanced phosphorus recovery

In terms of environmental performance, the scenario which had a great positive effect by reducing the micropollutants emissions (-80%), was the one towards Pollution Prevention. It should also be noted that this scenario reduced the total value added for the municipality by half. The results of the eco-efficiency indicators (for baseline and technology scenarios) are presented in the spider chart .



Spider chart for eco-efficiency assessment in the Zurich Case Study

Biella Textile Industry Case study, Italy

The hotspots-environmental weaknesses identified include:

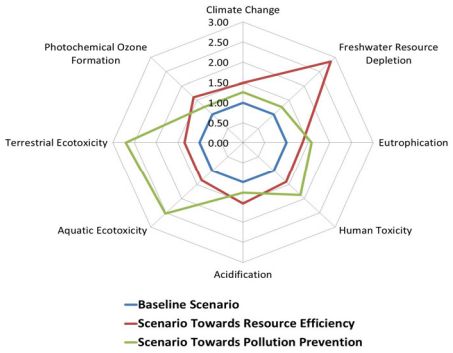
- Freshwater Resource Depletion, due to the extensive amount of water used during dyeing processes; and
- Aquatic and Terrestrial Ecotoxicity, due to the chemicals used in the dyeing process and the related pollutants in the effluents.

The technology scenarios assessed for the textile Case Study are shown in the table.

Both scenarios had a positive impact on the environmental performance indicators. More

Technology scenarios to improve eco-efficiency in the textile industry

Technology Scenario	Technologies
...towards Resource Efficiency	Smart Pumping Systems
	Automatic Dye and Chemical Dispensing
	Low-Liquor-Ratio Jet Dyeing Machines
...towards Pollution Prevention	Use of Natural Dyes
	Advanced Oxidation Process
	Membrane Bioreactor



Spider chart for eco-efficiency assessment in the Biella textile industry

specifically, the scenario towards resource efficiency reduced water abstraction by half and the one towards pollution prevention did the same for the toxic pollutants. The net economic output of the industrial unit A was increased by 149% in the Resource Efficiency scenario, while in the Pollution Prevention scenario it was reduced by 6.8%.
The results of the eco-efficiency indicators (for baseline and technology scenarios) are presented in the spider chart .

Cogeneration of Heat and Electrical Power Case study, the Netherlands

The case study was significantly upgraded to enable time dynamics. In contrast to other case studies, each scenario was a cluster of monthly consisted of monthly sub-scenarios. This allowed turning off parts of the installations in months with low thermal energy demands and low electricity wholsesale prices. It additionally allowed apply more detailed electricity and thermal energy production efficiencies.

Technology scenarios to improve eco-efficiency in the energy industry

Technology Scenario	Technologies
...towards Resource Efficiency & Pollution Prevention	Removing heat only boilers (HOB)
	Removing thermal energy storage (BUF)
	Micro-CHP (a)
...towards Circular Economy	Additional thermal energy users (b)
	Potable water preheating (a)

The hotspots-environmental weaknesses identified were:

- High thermal pollution due to large amounts of waste heat rejected to the surface water

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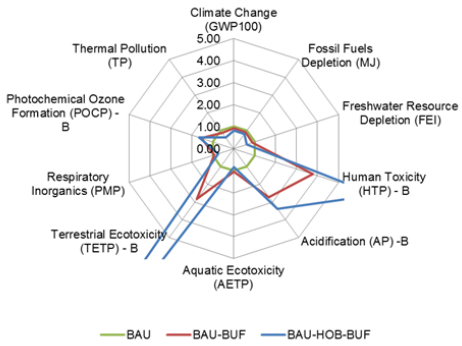
through cooling water;

- Consumption of natural gas and high amount of the relevant emissions to air (both greenhouse gases and toxic substances) due to electricity production;
- Steeply increasing environmental pressures of indicators dominated by background processes due to increasing electricity needs in most scenarios, and
- Decreasing eco-efficiency due to reduction of total added value.

The technology scenarios assessed for the energy industry Case Study are shown in the table.

Concerning the Resource Efficiency & Pollution Prevention, it was observed that removing the thermal buffer and the heat only boilers improves the systemic eco-efficiency for those indicators dominated by background processes. These indicators are denoted " -B" in the spider chart. For other environmental pressures the business as usual scenario (BAU) shows increasing eco-efficiency. The "towards Circular Economy" scenario showed overall reductions of environmental pressures, which were however largely counterbalanced by the reduction of the total added value, resulting in little changes in the eco-efficiencies.



Eco-efficiencies of the removal of thermal energy storage (BAU-BUF) and removing also heat only boilers (BAU-HOB-BUF) in the energy industry Case Study

Dairy Industry Case study, Denmark

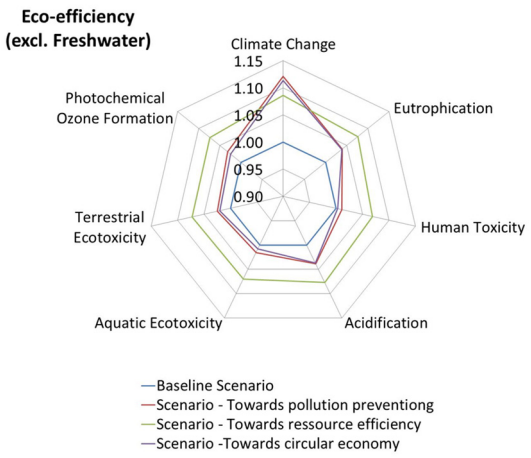
The hotspots-environmental weaknesses identified were:

- The wastewater treatment plant reduces environmental impacts to a low level;
- Pressures on water resources are moderate; and
- Climate Change, background impact due to energy use for process heating and circulation pumps.

The technology scenarios assessed for the dairy industry Case Study are shown in the table. The reduction seen in all three scenarios for the environmental performance indicators was remarkable, particularly for the water abstracted (reduction by 133% and 316%). The net economic outputs of all actors were decreased by the implementation of the scenarios, except for

Technology scenarios to improve eco-efficiency in the dairy industry

Technology Scenario	Technologies
...towards Resource Efficiency	Product and water recovery from CIP
	Cleaning and reuse of condensate
...towards Pollution Prevention	Anaerobic digester
	Product and water recovery from CIP
	Advanced oxidation and UV
...towards Circular Economy	Advanced oxidation and UV
	Cleaning and reuse of condensate



Spider chart for eco-efficiency assessment in the dairy Industry

the dairy scenario, where it was increased by 10% in all the three cases.

The results of the eco-efficiency indicators (for baseline and technology scenarios) are depicted in the corresponding spider chart. All the scenarios examined seem to significantly improve the freshwater depletion eco-efficient indicator. The analysis reveals that applying the full array of technological options improves the use of water in the entire value chain of the dairy.

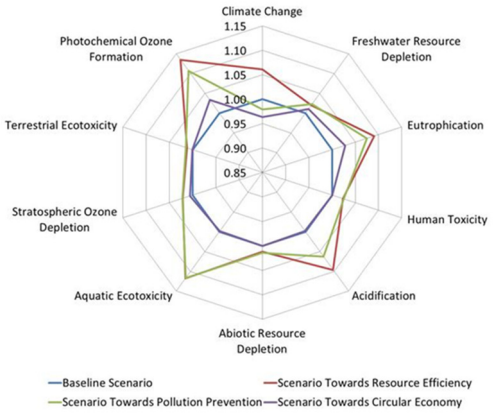
Automotive Industry Case study, Sweden

The hotspots-environmental weaknesses identified were:

- Eutrophication due to the phosphorus in wastewater after the corrosion protection process;
- Aquatic Ecotoxicity, due to the heavy metals in wastewater after the corrosion protection process; and
- Climate Change, background impact due to energy use for process heating and circulation pumps.

Technology scenarios to improve eco-efficiency in the automotive industry

Technology Scenario	Technologies
...towards Resource Efficiency	Silane-based corrosion protection
	Recycling of process water and chemicals
...towards Pollution Prevention	Membrane distillation
	Silane-based corrosion protection
	Recycling of process water and chemicals
...towards Circular Economy	Membrane distillation
	Recycling of process water and chemicals



Spider chart for the eco-efficiency assessment in the automotive Industry

The technology scenarios assessed for the automotive industry Case Study are shown in the table. The Pollution Prevention and Circular Economy scenarios both had negative effects on the greenhouse gas emissions and the energy used, while the Resource Efficiency scenario was the only one which reduced all three indicators assessed.

The results of the eco-efficiency indicators analysis (for the baseline and technology scenarios) are presented in the spider chart.

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ZURICH URBAN WATER SYSTEM WORKSHOP

The Waedenswil Urban Case Study Workshop took place on the 19th of March 2014 in the Countryside Hotel on the peninsula Au. Nine EcoWater partners and twelve local stakeholders participated in the Workshop, which aimed at the discussion of the baseline eco-efficiency assessment results for the case study and the evaluation of technological options for the improvement of the system's eco-efficiency.

Christoph Hugi (FHNW) presented the EcoWater project to the participants including general information, the meso-level perspective of the case study and the connection to the river basin management framework proposed to be used in Switzerland. Olga Steiger (FHNW) presented the baseline assessment of the Waedenswil Case Study, including the definition of eco-efficiency, the methodology of the project, the case study system boundaries, the environmental, economic and eco-efficiency indicators and concluded with the results of the eco-efficiency assessment.

Closing the urban water cycle

Dionysis Assimacopoulos (NTUA) briefly explained the challenges of enhancing meso-level eco-efficiency, by "closing the urban water cycle". He presented an overall cross-comparison of the two EcoWater urban case studies and the proposed technologies for the Waedenswil Case Study and their foreseen impact on the eco-efficiency in terms of resource efficiency, pollution prevention and promoting circular economy. He concluded by presenting the existing knowledge gaps and the identified transitional technical and political factors.

Discussing the feasibility of alternative technological solutions

Finally, a preliminary list of the potential technologies to improve the eco-efficiency was presented by Claudia Niewersch (FHNW), including energy efficiency in drinking water distribution network, water saving appliances for households, heat recovery from wastewater and removal of micropollutants.

Some conclusions highlighted during the Workshop were:

- The option energy recovery through be turbine in the WWTP effluent should be assessed;
- Some actors lack motivation to implement innovations beyond the necessary measures;
- Financial compensation options for SMEs in form of financial incentives to use water more efficiently additionally to reduced fees should be evaluated; and
- One possible long-term water cycle scenario for Waedenswil could be the re-dimensioning of the water system as a consequence of efforts towards a closed loop economy with advanced water reuse and recycling in industry.

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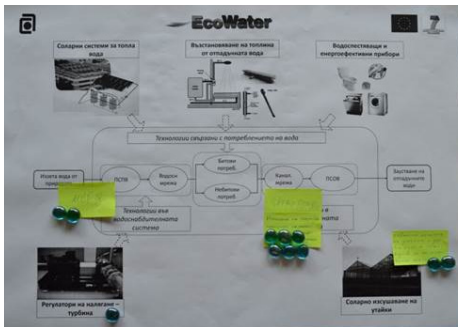
SOFIA URBAN WATER SYSTEM WORKSHOP

The 4th EcoWater Case Study Workshop was held in Sofia (Bulgaria) on the 25th February in 2014. It was attended by 5 EcoWater participants and 13 local stakeholders. The aim of the Workshop was to bring together actors involved in urban water and wastewater systems in Sofia and discuss on the innovative technologies for urban water management.

Peyo Stanchev (UACEG) described the Sofia Case Study and the motivation for studying the specific urban water system. He presented the eco-efficiency assessment methodology in the case of an urban water system, the results of the baseline assessment as well as five proposed technologies in order to upgrade the studied system. Participants were encouraged to comment on these technologies and to suggest other possible innovative technologies that might be relevant for the case study. During the discussion, three more alternative innovative technologies were proposed and accepted for further examination by the group. Participants were then asked to "invest" or vote for a certain technology using small stones. Heat recovery from the sewerage system and energy generation through hydropower plant on the feeding pipe of the WTP were the two technologies with the most votes, selected to be further examined in the next Workshop session.



Voting for the most favorable technologies

Break out groups for identifying the PESTLE factors that influence technology uptake

During the second session, all participants were divided into two groups and discussed on the possible drivers and barriers which may affect the uptake of the two selected technologies. It was decided that this financial opportunity for real eco-efficiency investments could be of common interest for all actors.

The main outcome of the Workshop was the list of PESTLE factors that influence the implementation of two innovative technologies. The main conclusions drawn were:

- Both technologies ultimately selected by the participants were not proposed by the project team;
- The discussion on technologies led to an extended list of proposed technologies, and to the identification of additional drivers and barriers relevant to the supplementary technologies; and
- The meeting between main stakeholders in the Urban Water and Wastewater System in Sofia provided a good opportunity to communicate information, discuss on common problems and share ideas.

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RECENT ECOWATER RELEASES

Deliverables

The following EcoWater Deliverables were developed since January 2014, and are publicly available in the Project Website (http://environ.chemeng.ntua.gr/ecowater/):

Deliverable 2.2: Baseline eco-efficiency assessment for the analysed agricultural water systems

The Deliverable presents the results of baseline meso-level eco-efficiency assessment of the Sinistra Ofanto Irrigation Scheme and the Monte Novo Irrigation Scheme. The methodological approach followed is the same in both case studies. Inventory analysis was used for data collection to estimate all the inputs and outputs in relation to the functional unit. The environmental impacts analysis on a cluster (crop) level was performed on the basis of the irrigation (water) supply to crops and corresponding agronomic practices.

Deliverable 2.3: Innovative technologies for eco-efficiency improvement in agricultural water use

The Deliverable focuses on the identification of technologies and practices for eco-efficiency improvement. Several technologies and management practices for eco-efficiency improvement are taken into consideration for both case study areas, taking local specificities into account. These technologies and practices include: i) advanced technologies for water supply management (remote and automated control of irrigation, shifting to efficient irrigation methods – drip and subsurface drip, deficit irrigation strategies), ii) energy saving technologies (variable speed pumps, network sectoring, dynamic pressure regulators), iii) eco-friendly agronomic practices (cropping pattern changes, super high density plantations for olive farming, conservation agriculture and organic farming techniques).

Deliverable 2.4: Technology assessment and scenario analysis

This document analyses the methodological framework and the technological interventions in the water use stage in the Sinistra Ofanto and Monte Novo Case Studies (agricultural sector).

Deliverable 3.2: Baseline eco-efficiency assessment in urban water systems

The Deliverable summarizes the results of the baseline eco-efficiency assessments in the two EcoWater urban water supply case studies. These results build up on the preceding EcoWater Deliverable "D2.1: Value Chain Description of the Analysed Urban Water Systems". The interpretation of the derived results was used to guide the selection of potential technologies to enhance the eco-efficiency of the system assessed in the next phase.

Deliverable 3.3: Innovative technologies for eco-efficiency improvement

This Deliverable contains information about innovative technologies with the potential to increase the eco-efficiency in urban water value chains. Technologies were identified according to the specific characteristics in two case study sites: Sofia, Bulgaria and Waedenswil, Zurich, Switzerland. The technical descriptions of the technologies include information on the working mechanisms, the environmental performance, cost data and technological maturity.

Deliverable 3.4: Technology assessment and scenario analysis

The Deliverable presents the results of the case studies in Sofia, Bulgaria and Canton of Zurich, Switzerland of the EcoWater project, derived based on the last EcoWater deliverables 3.2 "Baseline eco-efficiency assessment in urban water systems" and 3.3 "Innovative technologies for eco-efficiency improvement. In this report, the selected technologies were assessed re-

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garding their effects on the previously calculated baseline eco-efficiency of the current state individually, and as characteristic combinations of measures in scenario analysis.

Deliverable 4.2: Baseline eco-efficiency assessment of water use in industrial sectors
The Deliverable presents results of the work undertaken during the second phase of the Case Study Development progress and the second year of the EcoWater Project, for the four industrial Case Studies. The Baseline Eco efficiency Assessment was based on the Value Chain Mapping presented in Deliverable 4.1. The analysis revealed the environmentally and economically weak stages and actors, providing the basis for the next and final phase of the Case Study Development, the identification and the assessment of innovative technologies.

Deliverable 4.3: Innovative technologies for enhancing the eco-efficiency of water use in industries
The Deliverable provides information on innovative technologies with the potential to increase eco-efficiency in the four examined industrial sector Case Studies. Technologies were identified according to the environmentally weak stages in each Case Study; the technical description provided includes information on the working mechanisms, the environmental performance, cost data, and technological maturity of each technology presented.

Deliverable 4.4: Technology assessment and scenario analysis
The Deliverable includes a holistic assessment of potential eco-efficiency improvements from the application of the identified technologies in the four Case Studies. The analysis of different scenarios is used to evaluate uncertainties and enhance the interpretation of results.

Deliverable 5.1: Step-wise consolidated guidelines for the development of meso-scale eco-efficiency indicators
This document presents a methodological approach for the eco-efficiency assessment of meso-level water use systems. The main objective is the establishment of a homogeneous approach for assessing the system-wide eco-efficiency improvements (or deteriorations) from innovative technologies, applicable to different water use systems, using eco-efficiency indicators.

Deliverable 5.2: Cross comparison of Case Study outcomes
The Deliverable presents consolidated findings from the Case Studies in a coherent format which allows for a cross-sectoral assessment of eco-efficiency indicators. It further clarifies which of the analysed aspects are specific to water usage and which are of wider relevance to meso-scale eco-efficiency assessments across different systems.

Deliverable 5.10: Finalised Guidelines for the use of the EcoWater Toolbox
The Deliverable provides detailed guidelines for the use of the EcoWater Toolbox. All functionalities are described and thoroughly presented through screenshots and explanations.

Deliverable 5.11: Policy recommendations for technology uptake
The Deliverable summarises the current barriers and policy efforts that should be considered for the adoption of technology for eco-efficiency improvement in each Case Study individually in the EcoWater Project.

Deliverable 6.2: Synthesis report from the 2nd Round of Case Study events
The Deliverable presents the main outcomes from the second round of EcoWater Case Study Workshops, which aimed at presenting the key outputs and results of the project and discussing their applicability.

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D6.4: Report from 2nd targeted event –Industry Links

The Deliverable reports on the key outcomes and presentations from the 2nd EcoWater targeted event, also exploring project outputs of relevance to the industrial community.

D6.5: Report from 3rd targeted event –Policy Links

The Deliverable provides the proceedings, including event presentations, of the Roundtable Discussion on Policy Scenarios held within the framework of the 3rd EcoWater targeted event, aimed at disseminating the Project to the policy sphere.

D6.6: Conference proceedings

This Deliverable presents the results of the final scientific event of the EcoWater Project, which took place on the 16th October 2014 in conjunction with "The Europe we want", 17th European Roundtable on Sustainable Consumption and Production, in Portoroz, Slovenia. The EcoWater project participants successfully submitted and delivered 12 presentations at the Conference; the abstracts and presentations are included in the proceedings

EcoWater contribution to the international scientific community

In addition to the project deliverables, the project team's contribution in terms of scientific publications included:

1. Ribarova, I., A first iteration of an eco-efficiency assessment of Sofia's urban water system, Procedia engineering, Elsevier
2. Levidow, L., Zaccaria, D., Maia, R., Vivas, E., Todorovic, M., Scardigno, A. (2014) Improving water-efficient irrigation: prospects and difficulties of innovative practices, Agricultural Water Management 146(1): 84–94, Elsevier, doi:10.1016/j.agwat.2014.07.012, http://www.sciencedirect.com/science/article/pii/S037837741400211X
3. Levidow, L., Lindgaard-Jørgensen, P., Nilsson, Å., Skenhall, S.A., Assimacopoulos, D. (2014) Eco-efficiency improvements in industrial water-service systems: Assessing options with stakeholders, Water Science and Technology 69(10): 2113-21, doi: 10.2166/wst.2014.131, IWA Publishing , http://www.iwaponline.com/wst/06910/wst069102113.htm
4. Levidow, L., Lindgaard-Jørgensen, P., Nilsson, Å., Skenhall, S.A., Assimacopoulos, D. (2015) Process eco-innovation: Assessing meso-level eco-efficiency in industrial water-service systems, Journal of Cleaner Production 89, forthcoming, Elsevier, doi: 10.1016/j.jclepro.2014.12.086
5. Rodrigo Maia, (2015), Eco-efficiency assessment in the agricultural sector: the Monte Novo irrigation perimeter, Portugal, Journal of Cleaner Production, Elsevier

Closing note from the coordinator

This final issue of the EcoWater Newsletter also marks the end of our Project. On behalf of our Consortium, I would like to thank you for following the development of EcoWater and our newsletters - we hope that, over the past three years, we have provided you with information of interest, and some food for thought.

Prof. D. Assimacopoulos, EcoWater Coordinator