EcoWater Case Studies

The 8 EcoWater Case Studies are formulated around a unifying theme (water service systems); however, each focuses on a sector of significant socio-economic importance and environmental impact.

Case Studies on Agricultural Water Systems & Use

Two Case Studies for the agricultural water service systems of Sinistra Ofanto, Italy and Monte Novo, Portugal, will focus on shifts from rainfed to irrigated agriculture and innovations that can reduce the relevant water and energy footprints and production inputs. They will also address costs, economic impacts and value added in relation to irrigation water use and choice of cropping patterns.

Case Studies on Urban Water Systems

Two Case Studies for the cities of Zurich, Switzerland, and Sofia, Bulgaria, will address issues and technologies associated with more sustainable and economically efficient urban water management, water conservation practices and cleaner production technologies in households and SMEs. They will also consider the different economic values associated with water use for the actors involved.

Case Studies on Water use in Industrial Sectors

Four Case Studies will address water use in the textile, dairy and automotive industries, and for the cogeneration of thermal energy and electricity. Emphasis is placed on the assessment of technologies towards closed-loop systems, recovery of resources and advanced treatment, and on the economic impacts among the actors involved, in order to reveal the means through which eco-innovations can be promoted in the corresponding sectors.

EcoWater Consortium

CIHEAM IAM BARI

Deltares
Enabling Delta Life

University of Applied Sciences and Arts Northwestern Switzerland
School of Life Sciences

FEUP FACULDADE DE ENGENHARIA
UNIVERSIDADE DO PORTO

UNIVERSITY OF ARCHITECTURE CIVIL ENGINEERING AND GEODESY

The Open University

DHI

IVL Swedish Environmental Research Institute

MiTA

Contact details & further information

Scientific Coordinator
Prof. Dionysis Assimacopoulos, NTUA | assim@chemeng.ntua.gr

Dissemination Responsible
Mr. Michiel Blind, DELTARES | michiel.blind@deltares.nl

Project web site
http://environ.chemeng.ntua.gr/ecowater

EcoWater

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

2011 - 2014

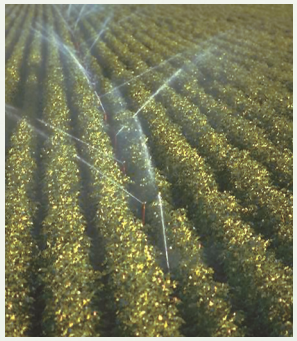
SEVENTH FRAMEWORK PROGRAMME

A Collaborative Research Project
of the 7th Framework Programme

Theme: Development of eco-efficiency
meso-level indicators
for technology assessment

EcoWater Background

New techno-economic systems, able to decouple economic growth from resource depletion, are a prerequisite for a resource-efficient Europe. Significant research effort is dedicated to measuring progress towards this goal, focusing inter-alia on **eco-efficiency** - the development of more economically valuable goods and services, while using fewer resources and generating less waste and pollution. Although eco-efficiency metrics are widely applied at the micro- and macro-levels, the corresponding indicators cannot be used to analyze systemic changes. On the other hand, **meso-level assessments**, which focus on the dynamic behavior of product and service systems, can be used to analyze interdependencies and heterogeneity among actors, and can thus support policies towards sustainable production and consumption.



EcoWater seeks to address the existing gap in eco-efficiency metrics by adopting a systems' approach for developing meso-level indicators and for assessing the performance of innovative technologies. The Project approach is tested through Case Studies on water service systems, motivated by: (i) the importance of water as production input, (ii) the significant environmental impact and costs entailed in making water suitable for different water-related innovative purposes, (iii) the need for holistic approaches in assessing the performance of different water-related innovative technologies, and (iv) the fact that the uptake of water-related innovations remains primarily regulatory-driven.

By studying the corresponding value chains, as well as the (economic) actors involved and their interactions, EcoWater will further seek to understand how technological changes in water service systems interrelate, and influence the economic and environmental profile of water use in different sectors.

EcoWater Objectives & Expected Results

The **research objectives** that delineate the EcoWater approach include the:

1. Selection of eco-efficiency indicators, suitable for assessing the system-wide eco-efficiency improvements (or deteriorations) from innovative technologies;
2. Integration of existing tools and assessment methods in a coherent modeling environment, allowing for the system-wide environmental and economic benchmark of innovations;
3. Elaboration of exemplary Case Studies in different systems and sectors to assess innovative technologies and practices;
4. Analysis and characterization of existing structures and policy instruments for technology uptake, through the conceptualization and simulation of different scenarios on relevant policy and management factors.

The main EcoWater **results** will include:

- A validated and tested methodological framework for assessing technology impacts on the eco-efficiency of water service systems;
- A toolbox, providing a platform which could be used by actors for the analysis of the eco-efficiency of their system;
- An improved understanding of the socio-technical dynamics that influence technology uptake and implementation, and insight on policies to foster eco-efficiency improvements, focusing on different sectors of water use.

Results will be widely disseminated through communication activities, events and targeted material, addressed to **local societies and private actors**, the **water industry and economic sectors** related to Case Studies, and the **policy sphere**, providing recommendations particularly focused on the Sustainable Consumption and Production Action Plan, the Water Framework Directive, and the Environmental Technologies Action Plan.

EcoWater Project Structure

The first EcoWater component concerns the elaboration of an **analytical framework** for quantitative meso-level eco-efficiency assessment, building upon the review, customization and selection of existing indicators and methods for environmental and economic assessment. The framework will encompass an inventory with information on technology performance, costs and footprints, and tools for the analysis of systemic improvements from eco-innovations.

Methodologies and tools will be tested and refined through the development of **8 Case Studies**. Their implementation will aim at the assessment of innovative methods to improve the eco-efficiency of water service systems, and of the economic impacts associated with technology uptake.

The **integration and synthesis** of results will include the elaboration of step-wise methodological guidelines, the development of an expandable and adaptable web-based toolbox to support future assessments, and the elaboration of policy recommendations. The latter will particularly focus on policy, structural, socio-economic and management factors for technology uptake in water service systems.

EcoWater will foster operational **science-industry-policy links** with relevant EU initiatives, policy actors and industry representatives interested in the EcoWater results.