aquaenvec

Assessment and improvement of the urban water cycle eco-efficiency using LCA and LCC

Presentation

The **AQUAENVEC** project is funded by the **LIFE+** Program of the European Commission. It is a three-year project (January 2012 to December 2014) done in collaboration between different research centres: **CETaqua** (coordinator), **UAB** (Universitat Autònoma de Barcelona), **USC** (Universidad de Santiago de Compostela) and **UV** (Universitat de València).

In order to work towards better **eco-efficiency** in the urban water cycle, an environmental and economic assessment will be performed on several case studies in Catalonia and Galicia, Spain. The results will then be generalised into a decision support tool applicable to European small and medium cities.

Objectives

✓Provide **decision-making tools** to optimise eco-efficiency, through environmental and economic analysis thus ensuring sustainable management of the urban water cycle.

✓Assessment of the **environmental impacts** and its reduction potential

✓Assessment of the **economic impacts** and evaluation of cost savings

✓Definition of environmental, economic and **eco-efficiency indicators** to promote a sustainable use of natural resources and reuse of end-products (sludge, water, …)

Methodology and expected results

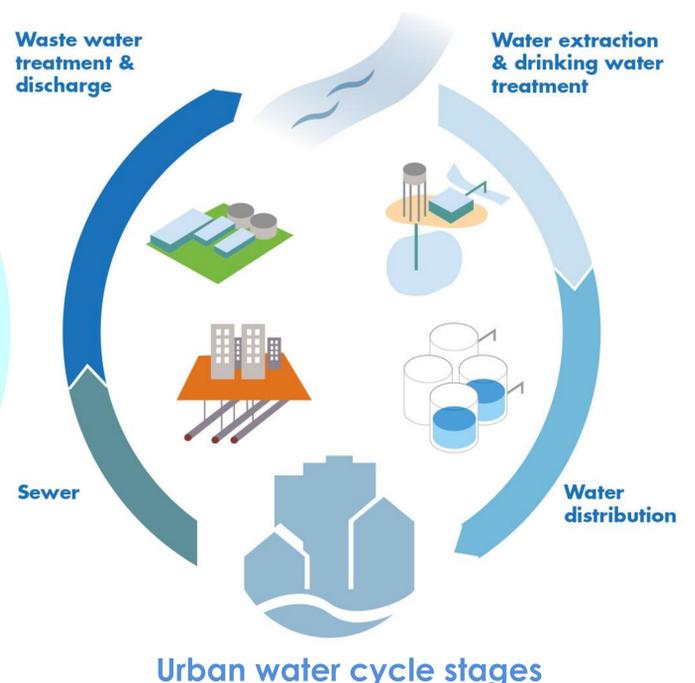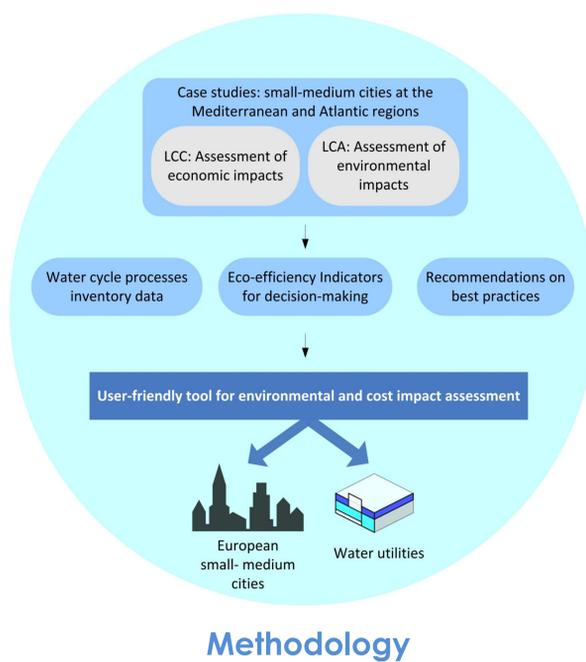✓**Common methodology** to assess eco-efficiency by means of an integration of LCA and LCC approaches

✓Definition of environmental, economic and **eco-efficiency indicators** for the urban water cycle

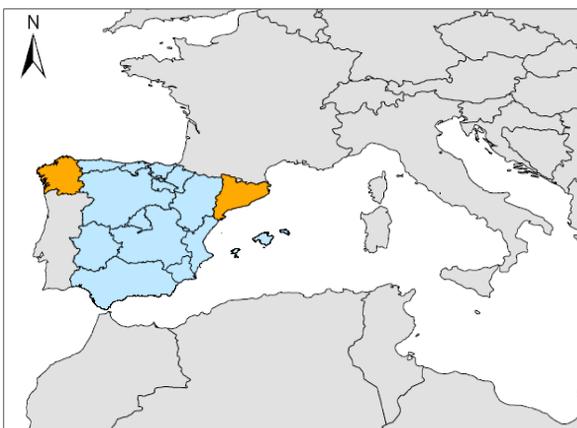✓**Recommendations of best practices** to improve eco-efficiency

✓Life Cycle Inventory **database** in terms of urban water cycle processes and activities according to the ELCD core database from the European Platform on LCA

✓User-friendly **tool** for non-experts on LCA-LCC to assess and improve eco-efficiency of small-medium size cities

✓Quantification of **eco-efficiency improvements** under alternative future scenarios considering the best practices applicable to the case studies

Case studies: small-medium cities at the Mediterranean and Atlantic regions

LCC: Assessment of economic impacts

LCA: Assessment of environmental impacts

Water cycle processes inventory data

Eco-efficiency Indicators for decision-making

Recommendations on best practices

User-friendly tool for environmental and cost impact assessment

European small- medium cities

Water utilities

Methodology

Waste water treatment & discharge

Water extraction & drinking water treatment

Sewer

Water distribution

Urban water cycle stages

Case studies

Galicia

- *Oceanic climate*, few dry periods
- *Average rainfall*: **1900 mm/year**
- *Population density*: **94 inhab/km²**
- Mostly **rain-fed agriculture**
- *Household water consumption*: 146 L/cap/day

Catalonia

- *Mediterranean climate*, water stress
- *Average rainfall*: **730 mm/year**
- *Population density*: **234 inhab/km²**
- Mostly **irrigated agriculture**
- *Household water consumption*: 139 L/cap/day

Several case studies in Catalonia and Galicia will be analysed in detail. These two regions have different characteristics in terms of climate, population density, water use patterns, etc. These differences affect the urban water cycle management and the implications in terms of environmental and economic impacts will be analysed and included in the tool developed.

The results will then be generalised to European small and medium cities. The tool will help water managers minimise the environmental impact of the water cycle in their urban area and decrease associated costs in parallel.

Find more information on the project here: **www.life-aquaenvec.eu**

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