Abstract for the 22nd SETAC Europe LCA Case Study

Section: LCA of urban water systems from resources to users: water withdrawal, water treatment & distribution, water use, wastewater sanitation and reuse.

Sustainability assessment of integrated innovative wastewater technologies in Mediterranean tourist facilities (DemEAUmed project)

The aim of demEAUmed is to demonstrate and promote the integration of innovative water treatment technologies to achieve an optimal and safe closed water cycle in Mediterranean tourist facilities. Water resources are limited and unequally distributed geographically and among the year seasons, with higher pressure during summer, in Mediterranean regions. For instance, water consumption per guest has been estimated at 222 L/day in hotels in Spain[1]. So, it is of great importance to achieve a holistic water resource management. DemEAUmed affords the reuse of greywater and wastewater generated in touristic facilities with an integrated approach bringing environmental benefits such as water savings and management carbon footprint reduction.

Eight different innovative technologies together with an advanced monitoring, control and decision support system have been integrated and implemented on the demonstration site: Samba Hotel-Lloret de Mar, Catalunya, Spain). These technologies are being assessed through a comprehensive Life Cycle Assessment (LCA), including the life stages of construction and operation of technologies, assessing the impacts for each individual technology and for the demo-site integration. Besides the LCA, a Life Cycle Costing (LCC) is being performed in order to analyse the economic costs and to promote a global sustainable system. A social LCA is also conducted in order to assess the social impacts generated by the project. A comparative analysis is being prepared between the baseline scenario and the scenario with the implementation of demEAUmed. Final results will be extrapolated in a hypothetically situation of implementing demEAUmed solution in different touristic facilities of Mediterranean areas.

The expected results are to:

- Obtain a complete sustainability profile of DemEAUmed solution developed and the different WWT technologies (including environmental, social and economic impacts).
- Calculate sustainability benefits from the reuse of greywater and wastewater in tourist facilities by complying with water quality requirements and regulations.
- Account the reduction of costs of wastewater treatment assumed by touristic facilities.
- Account the reduction of environmental impacts of water management in touristic facilities.

[1] Gössling, S., Peeters, P., Hall, M.C., Ceron, J.-P., Dubois, G., Lehmann, V., Scott, D., Tourism and water use: Supply, demand, and security. An international review. *Tourism Management* 33, pp. 1-15, 2012