SUSTAINABILITY ASSESSMENT OF INTEGRATED INNOVATIVE WASTEWATER TECHNOLOGIES IN MEDITERRANEAN TOURIST FACILITIES (DEMEAUMED PROJECT)

Ariadna Claret[1], Carme Hidalgo[1], Marta Escamilla[1]

[1]Leitat Technological Centre. C/ de la Innovació, 2. 08255 - Terrassa, Barcelona (Spain). www.leitat.org

aclaret@leitat.org; chidalgo@leitat.org; mescamilla@leitat.org

demEAUmed OBJECTIVES

1. To obtain a complete sustainability analysis (environmental, economical and social) of demEAUmed solution, and for the different wastewater treatment technologies involved in.
2. To propose environmentally friendly recommendations for each of the wastewater treatment technologies analysed, in order to reduce their potential impacts.
3. To indentify and calculate the sustainability benefits from the reuse of grey water and wastewater in touristic facilities by complying with water quality requirements and regulations.
4. To reduce the economic cost of wastewater treatment assumed by touristic facilities.
5. To account the reduction of environmental impacts by implementing demEAUmed solution in touristic facilities instead of conventional wastewater treatments.
6. To run one demo site to provide evidence of benefits of water reuse and the possibility of implementing an optimal and safe closed-loop water cycle in Euro-Mediterranean tourist facilities.
7. To involve industry representatives, stakeholders, policy-makers and divers technical and scientific experts in demonstrating and promoting innovative technologies, for an optimal and closed-loop water cycle in Euro-Mediterranean tourist facilities, leading to their eventual market uptake.
8. Increase consumers and touristic managers awareness on water scarcity, fresh water consumption and water management.

THE PROJECT

THE CONTEXT OF THE PROJECT

Euro-Mediterranean areas suffer water scarcity episodes, due to the unequally distribution of water resources in space and time. In areas with high touristic activity in summers, in where exists a mismatch between fresh water availability and water demand, this problematic is increased.

demEAUmed SOLUTION affords eight innovative technologies, monitoring and control systems and a decision support tool to improve sustainable water management in touristic facilities in light with also global touristic market.

DEMO SITE– LLORET DE MAR –SAMBA HOTEL

8 TECHNOLOGIES FOR A CLOSED-LOOP WATER CYCLE

Electrochemical ozonation technology

Electrocoagulation-Flotation technology (ECEF)

Plimmer technology

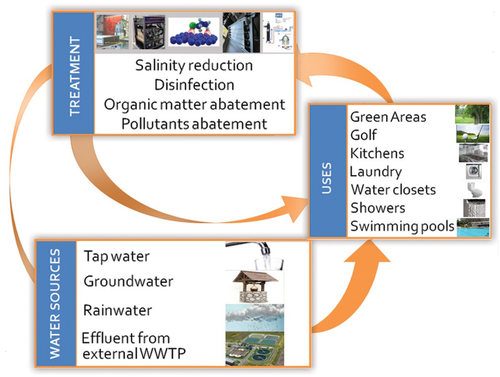
Smart Air MBR technology

Solar Photoelectro-Fenton process

Uvox technology

Vertical Ecosystem technology (VertEco)

172 NM UV treatment



METHODOLOGY APPLIED

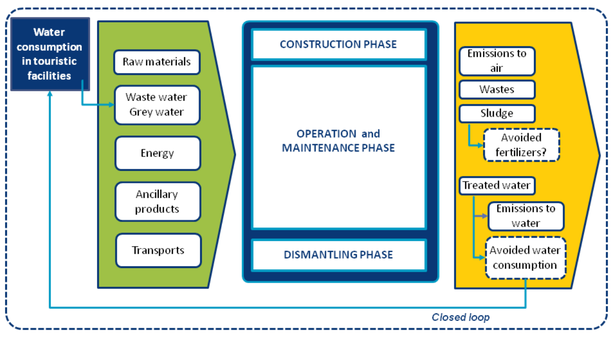
LCA
According to Life Cycle Assessment
ISO 14040 and 14044

LCC
According to Environmental Life Cycle Costing

S-LCA
According to the Methodological Sheets for Sub-categories in social LCA

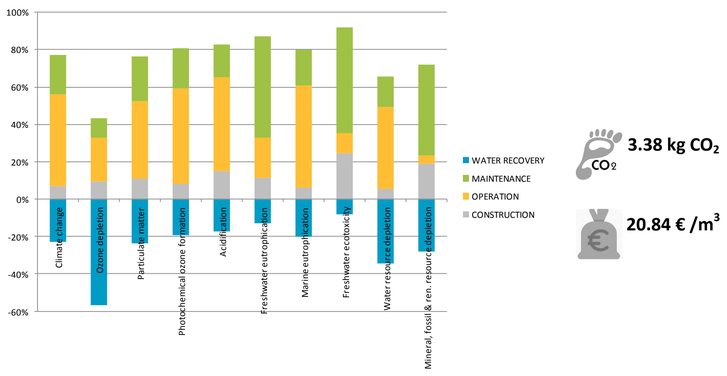
Functional Unit:

One m^3 of grey water/wastewater generated in a touristic facility treated in order to be reused for different non-potable or potable uses.



SYSTEM BOUNDARIES

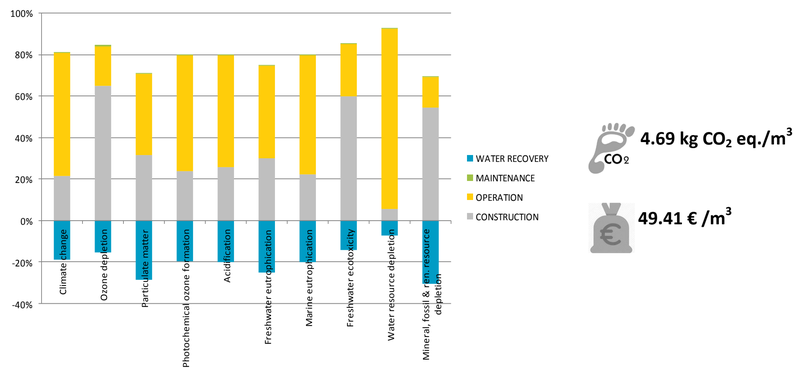
PRELIMINARY RESULTS



3.38 kg CO_2

20.84 € /m^3

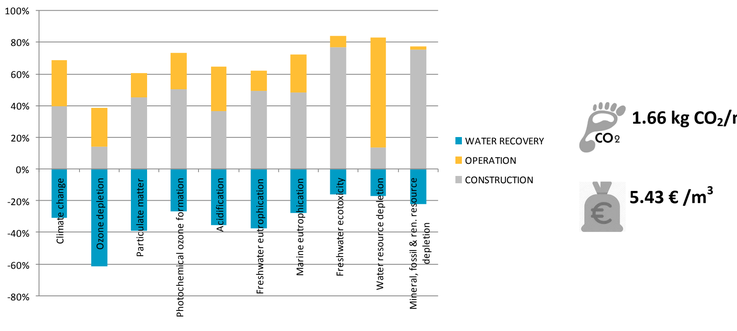
Figure 1. Environmental impact contribution of Electrocoagulation-Flotation



4.69 kg CO_2 eq./m^3

49.41 € /m^3

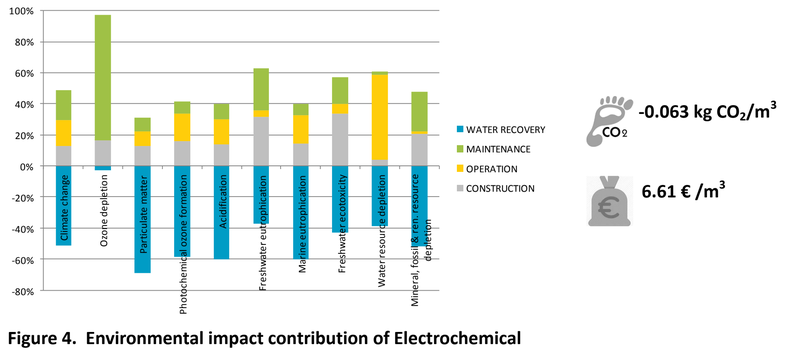
Figure 2. Environmental impact contribution of Photoelectro-Fenton



1.66 kg CO_2/m^3

5.43 € /m^3

Figure 3. Environmental impact contribution of VertEco



-0.063 kg CO_2/m^3

6.61 € /m^3

Figure 4. Environmental impact contribution of Electrochemical Ozonation

SOCIAL LIFE CYCLE ASSESSMENT

Some advances have achieved by determining some socio-economic indicators. Further works should do in the future to quantify the socio-economic impacts and benefits of demEAumed.

Stakeholder	Subcategories	Indicator
Employees	Working hours	Hours spent per day to monitor demEAUmed technologies
Local community	Local employment	Number of new jobs created locally, related to demEAUmed project
Local community	Community engagement	Number of group meetings celebrated with community stakeholders
Global Society	Contribution to economic development	R&D costs related to revenue of the technology providers
Consumers	Health & Safety	Percentage of improvement of water quality parameters
Value chain actors	Promoting social responsibility	Membership in an initiative that promotes social responsibility
Policy Makers	Legislation	New legislation related to water reuse and water savings
Scientific community	Promotion of innovative technologies	Involvement in technology transfer programs or projects

Figure 5. Examples of socio-economic indicators determined to quantify the social impacts and benefits of demEAUmed solution

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For more information you can visit the project website **www.demeaumed.eu**

This project has received funding from the European Union's Seventh Programme for research, technological development and demonstration under grant agreement No 619116.