



Demonstrating integrated innovative technologies for an optimal and safe closed water cycle in Mediterranean tourist facilities



demEAUmed (FP7/ WATER INNO&DEMO) GRANT AGREEMENT NO. 619116

Newsletter

Editorial



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Dear Reader,

As the project coordinator of demEAUmed project, it is an honour for me to present the second newsletter of the project where you can read the most outstanding results and developments achieved up to month 38 of the project. These three years have been nothing but a successful collaboration among all the participants of demEAUmed. The consortium has achieved the proposed milestones and deliverables planned in the document of work (DOW) well in time.

If you have the opportunity to come to the region of Costa Brava in Catalonia and visit the city Lloret de Mar you will see the integration of a set of innovative technologies to treat the wastewater of the hotel Samba (project's demo-site). This main achievement has been possible thanks to the excellent work performed by all the partners and their commitment towards the development of the future decentralized wastewater treatment in Mediterranean tourist facilities.

On behalf of the whole demEAUmed's team I hope you enjoy this second newsletter and I warmly welcome you to visit our website to have more information about us and demEAUmed and to attend the demEAUmed Final Conference that will be held at Barcelona the next 18th of May 2017.

Save the date! demEAUmed Final Conference, May 18th 2017 in Barcelona

Registration is now OPEN!

Join us at demEAUmed Final Conference where results, benefits and opportunities of demEAUmed technologies in managing, treating and recycling water will be presented and discussed. One of the aims of the conference is to involve different stakeholders to demonstrate and promote innovative technologies to reduce the impact of tourism sector on the environment. Hotel owners will be able to use the developed Decision Support System (DSS) to assess how much water savings they could achieve as well as the associated environmental impacts. Furthermore, the private sector will have the chance to discuss with the technology providers the possible exploitation opportunities.

Find the agenda and the key note speakers of the event [here](#) !

We look forward to meeting you there!



News from demEAUmed project

Results of the Environmental and Socio-Economic Assessment of demEAUmed Technologies

The eight innovative demEAUmed technologies, after tests at pre-demonstration level, have been scaled-up, placed at the demonstration site and are being run in real conditions with two main lines for greywater and wastewater treatment. The majority of demEAUmed technologies can be implemented singularly and some of them are being also compared, in terms of efficiency and other environmental and economic parameters, to define the best conditions. All the experiments results are being compared with the requirements of the Spanish Royal Decree 1620/2007 (SRD 1620/2007) and other national and European legislation for many possible reuse applications (like toilet flushing, irrigation of private gardens, golf irrigation, groundwater recharge and laundry). All installed technologies were connected and are monitored by a common server for supervision, control and data acquisition.

The experiments of the greywater treatment line and the

The installation of the wastewater treatment line is completed and the experiments with the electrocoagulation-electro flotation technology as a primary treatment followed by the MBR are on-going with an improved wastewater catchment from the hotel manhole. The electrochemical ozonation and the 172 nm UV treatment, with an improved software and optimized lamp frame and electrical driver, are ready to be tested. [Read more here](#)

Results of the Environmental and Socio-Economic Assessment of demEAUmed Technologies

An integrated assessment of the environmental and socio-economic impacts of the innovative and integrated technological solution, proposed in demEAUmed project, has been undertaken by demEAUmed consortium under the leadership of the Sustainability Division of LEITAT.

The methodology applied in the assessment is based on the **Life Cycle Assessment (LCA)**, the **Life Cycle Costing (LCC)** and the **Social Life Cycle Assessment (S-LCA)**. The primary results of the LCA and LCC have been obtained and analysed involving four technologies: the **Electrocoagulation-Flotation** technology, the **Photoelectro-Fenton** technology, the **VertECO** technology, and the **Electrochemical Ozonation** technology.

Regarding the **environmental life cycle assessment (LCA)**, the results show that these four technologies have achieved important environmental impacts savings thanks to the greywater recovery and water reuse. The primary results also addresses the main environmental impact contributions of the four demEAUmed technologies in the construction stage, maintenance stage and operation stage including energy consumption, transportation and structural materials.

To reduce the environmental impacts contributions of the above mentioned technologies, and similar ones, some **recommendations** were given.

Regarding the **Life Cycle Costing (LCC)**, the overall cost of treating one cubic meter (1m³) of greywater or wastewater by the demEAUmed technologies along their life cycle are being studied. Table 1 summarizes the total cost of treating 1m³ of greywater by VertECO and Electrochemical Ozonation technologies.

Finally, the **Social Life Cycle Assessment (S-LCA)** has presented some indicators and the quantification of the socioeconomic impacts and the benefits provided by demEAUmed project are being currently analysed. More efforts will be done during the coming months regarding socio-economic analysis. For detailed results, check demEAUmed website.

alternative swimming pool water disinfection (five technologies: Smart Air MBR, VertECO, Plimmer, UVOX, SPEF) are being finalized and provided long term characterization with high efficiency for organic compounds, solids, for nitrification and many micro-pollutants.



Figure 1 demEAUmed demonstration site (Samba Hotel)

Technology	Cost (€/m ³ water treated)
VertECO	5.43
Electrochemical Ozonation	6.61

Table 1. Cost of treating 1 m³ of greywater per each demEAUmed technology analysed

Water Reuse and Tourism: Market Potentials

A new mini-report entitled 'Water Reuse and Tourism' was published by LGI consulting which presents the status of water reuse and treatment market globally focusing on the tourism sector as well as the market challenges facing grey- and wastewater technologies. The mini-report also dedicates a section on the 'market potential' for demEAUmed solution which is undoubtedly relevant for all water treatment technologies.

According to the report, the main challenges facing the uptake of water reuse solutions are: public acceptance, market and information failures, regulatory constraints, poor coordination of water professionals and technical and health/environmental challenges.

Despite the aforementioned challenges, the market for wastewater treatment and reuse is growing due to the water scarcity and necessity, regulations and environmental constraints. Between 2009 -2012, the global market for wastewater recycling and reuse increased from \$6.7 billion to \$9.5 billion (CAGR) and it is expected to increase up to \$23.4 billion by this year (BBC research, 2013).

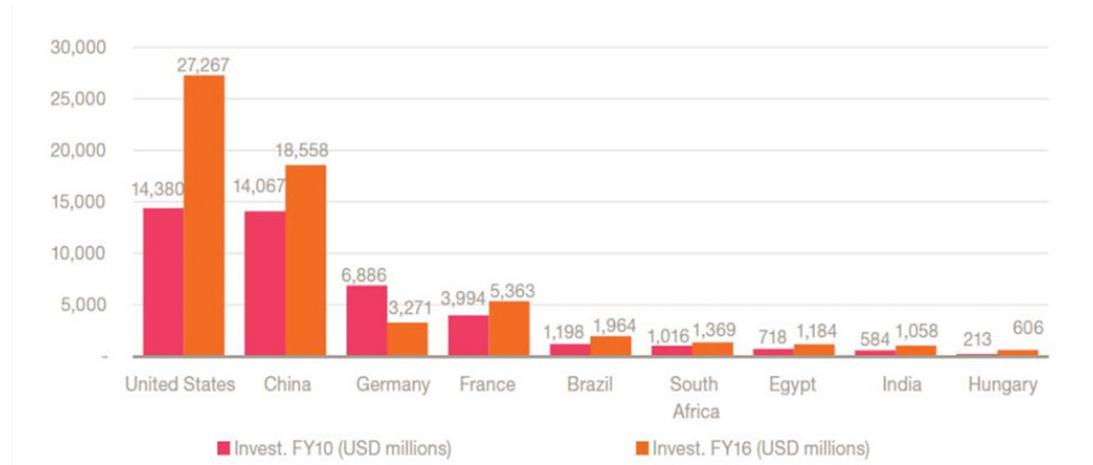


Figure 2 Investment in wastewater sanitation, 2010 vs. 2016. PwC, 2012

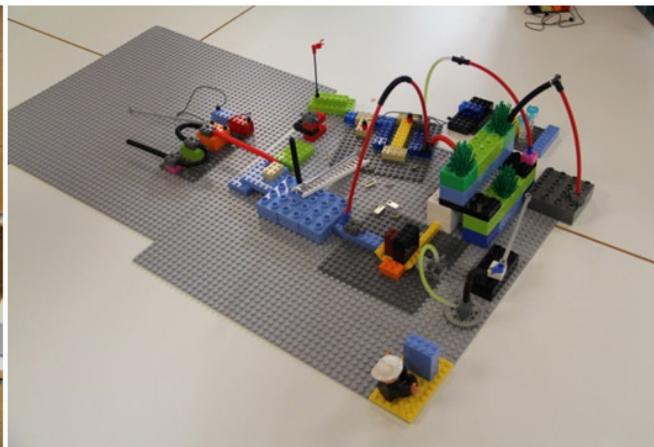
For demEAUmed, the most interesting uptake of its solution falls in the following categories: the leisure, creation and holiday's touristic establishments, green hotels, branded hotels and luxury, upper-upscale and upscale hotels.

Regarding the most interesting countries to target are: the islands with high stress or little/no access to water (e.g. some islands in Greece, Sardinia and Pacific islands), the remote areas especially in developing countries (e.g. North Africa, India, China and South America) and highly urbanised cities and countries that seeks for acquiring a green image such as the UK and the UAE.

Finally, demEAUmed solution can also be an answer for other sectors such as for urban use in small and remote communities dealing with water shortages and for commercial buildings market in specific stressed areas. To read the full mini-report, please click on ([link](#)).

Lego Serious Play: Sparking the creativity & dialogue within demEAUmed consortium

The LEGO® SERIOUS PLAY® (LSP) methodology is an innovative process designed to enhance innovation and business performance. Based on extensive research which shows that this kind of hands-on, "play" context produces a deeper, more meaningful understanding of the world and its possibilities, LSP stimulates imagination and supports an effective dialogue – for everyone in the organisation.



LGI consulting, demEAUmed partner responsible for exploitation activities, has conducted in the past a number of ideation workshops applying methodologies that facilitate group discussion, knowledge sharing and problem solving. Back-to-back with the 6th General Meeting of demEAUmed project, LGI consulting organised a LEGO® SERIOUS PLAY® workshop in order to boost further discussions on mature enough technologies for exploitation and potential strategical partnerships between partners after the end of the project. The workshop was delivered by LGI trained facilitators who have undergone an official LSP certification. Six different technologies were involved and presented through Lego [here](#).



Figure 3 demEAUmed partners

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