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 The research leading to these results has received funding from the European Union Seventh Framework Programme (FP7/2007-2013) under Grant Agreement no. 619039. This publication reflects only the author's views and the European Union is not liable for any use that may be made of the information contained therein.

EDITORIAL

Dear readers,

The Project Steering Board (PSB) meeting is upcoming. On the 22nd and 23rd of June, the consortium will get together to report the project activities of the first 18 months to all partners and the Project Advisory Committee (PAC). The event will take place at the Emscherquellhof (close to Dortmund, Germany).

This meeting coincides with the launch of the pilot “lamella settler” in the demo site of Emscher. The container arrived a few months ago and has been set-up in recent weeks so the partners will have the opportunity to see the installation firsthand. The Emscher region is an example for environmental restoration, going from a contaminated industrial zone to a green space, where leisure and recreation join nature.

During the meeting the most promising research results of the first tasks will be presented, and the link with the demonstration sites and the applicability of the results will be highlighted as well. I am looking forward to a successful meeting and we'll be pleased to report the results in our next newsletter and on the website. Do not miss it!

Best regards,

Marta Hernández, Llobregat Demo Site Leader

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OUR DEMO SITES WHAT'S HAPPENING?

ATHENS (GREECE)

Athens has suffered rapid urbanization resulting in few urban green spaces. Coupled with peri-urban forest fires in the last decade, this resulted in severe degradation of its environment and quality of life of its inhabitants. What is seen as priority is the deployment of innovative management options and technologies for reuse, needed to irrigate (primarily) green urban areas. The demonstration site of Athens therefore looks into sewer mining for distributed reuse within the urban environment, exploiting state-of-art Information and Communication Technology (ICT) solutions for distributed monitoring and management of multiple sites.

At the Athens pilot site, we demonstrate a fully automated packaged treatment plant, featuring membrane based, small footprint, sewer mining technologies that allow direct mining of sewage from the network, close to the point-of-use with minimum infrastructure required and low transportation costs for the treated effluent.

Distributed low energy sensor networks are coupled with distributed ICT intelligence innovations in terms of data fusion, data communication, interoperability and mobile solutions for remote controlling and operating the distributed infrastructure. The demo site is also used for testing reused water characteristics on the soil through onsite experiments, irrigating onsite peri-urban green.

The packaged treatment plant layout consists of two units, the Membrane Bio-Reactor unit and the Reverse Osmosis unit, combined in a new design of one containerized system. Membrane technology removes most viruses and bacteria from treated water as the chosen membrane has a pore size $\leq 0,030\mu\text{m}$. Effluent quality makes it appropriate for irrigation, car washing, WC flushing and even laundry and household uses, if RO is also used as tertiary treatment. The packaged treatment plant is under development and will be connected to the main sewage system within 2015.

INTERVIEW// KATERINA ANTONIOU - ATHENS PROJECT LEADER



"I am now confident that DESSIN will make a difference in demonstrating what is possible for the sector"

Katerina Antoniou is a Civil Engineer, specialized in Environmental Systems Engineering. She wrote her thesis on optimization of hydro-economic systems and is interested in urban water reuse, water quality and decentralized system technologies. For the past year she has been working for three FP7 funded projects as a research associate at the National Technical University of Athens (NTUA), in the Water Resources and Environmental Engineering Department.

After this year and a half, do you think the DESSIN project will reach its objectives?

Most certainly. It has been a great experience working within the Greek demonstration cluster in Sewer Mining, but also within the DESSIN community and I am now confident that DESSIN will make a difference in demonstrating what is possible for the sector.

How long have you been at the NTUA?

About two years. I started working in NTUA around the same period that DESSIN started, which presented a unique opportunity for combining research developments with market development (which is something I am personally very keen on exploring).

How do you value the visit of the consortium in Athens last November?

This was a great opportunity for both, the Athens pilot (to better explain what we are doing and what we are hoping to accomplish) but also for the DESSIN partnership as a whole. Face to face meetings make a difference, particularly in the early stages of a project.

How is the cooperation between all the 21 partners going? Is it a burden to work that way or does it add more perspective and richness to the project?

Cooperation and collaboration is actually one of the best things about DESSIN. The project is very carefully arranged around case study clusters that can work closely in a day to day fashion, but also has a number of mechanisms to collaborate between case studies. This means that although there are 21 partners, there is not that much overhead in communication/organization getting in the way of doing day to day things, while on the other hand it enables sharing of ideas and knowledge across partners. I think this way of working is possible because all the partners are very experienced in this type of work but it has been a great and novel experience for me to see how everything works so seamlessly!

How do you value the first 1,5 years of the DESSIN project at the Athens demo site? Have the planned goals been accomplished?

It has been a very productive and creative first period for the Athens site, which moved forward a lot on both, the technology and our ideas on it and the demo site itself. We did have some delays with hardware provision – the sensors in particular - which has delayed the final demo assembly, but fortunately everything is now back on track. In the process we learned valuable lessons of what to do (and what not to) and forged a much closer collaboration within the Greek Cluster.

SUCCESS STORY WA1 MEETING IN BARCELONA

Barcelona welcomed 19 members of the DESSIN team at the Work Area 1 meeting at the 4th and 5th of March. Organized by Ecologic and hosted at the Cetaqua headquarters, the scientists and researchers from eight different partners discussed overall coordination issues concerning technical aspects, and also exchanged views about the progress of the project in general. The main point of this meeting was to agree on the step-by-step guidance in the practical application of the DPSIR scheme, which is a framework for describing the interactions between society and the environment, developed by the European Environmental Agency.

The meeting also gave the opportunity to visit the mature site of the Llobregat (infiltration ponds) and the Drinking Water Treatment Plant in Sant Joan Despí, where the demonstration phase of the project will take place. This was interesting to the foreign partners, who had the opportunity to get to know the plant that serves as mature site for DESSIN.



DESSIN's well at the Llobregat Demo Site.

ESS SECTION AARHUS MATURE SITE

Aarhus is the second-largest city in Denmark and has the largest port in the country. The city is transitioning to become a center for research and development, as well as a manufacturing center for clean energy technologies. As part of this, Aarhus has made considerable investments in environmental planning with the goal of becoming a so-called "green city". These efforts include river restoration and water quality and recreational improvements in the city's harbour. Aarhus's investments in environmental planning are motivated by the perception that these investments will increase quality of life, ensure sustainability, and save money. The city seeks to attract a dynamic and well-educated population and it is thought that many of the recreational elements and sustainability objectives enhanced through the city's environmental planning measures will be attractive to current and potential residents.

As part of its environmental planning, Aarhus is developing water-related recreational elements to enhance the quality of life in the city center and the old harbour area. These include two different but related objectives: to restore a segment of the Aarhus River flowing through the city center that had been diverted underground; and to improve the hygienic quality of water in the harbour so that it is suitable for bathing.

An innovative, integrated solution was developed to manage the water quality in the river and harbour and support the restoration of the river in the old city center. The solution

uses bathing water quality standards established by the EU Bathing Water Directive as design targets. In addition, the system is designed to handle rainfall intensities that have not been observed in the historical record yet but are anticipated under climate change conditions.

The two central innovations of the Aarhus case study solution are the system of real-time monitoring and control and the warning system for bathing water quality. The real-time control system coordinates storage of CSO discharges in seven storage tanks to optimize system-wide capacity and minimize spills. The warning system for bathing water quality was established because the EU Bathing Water Directive permits one non-compliant event per year if a warning system is in place; otherwise, a non-compliant event is permitted only once every four years. The installation of the warning system was estimated to save 25 million Euros that would have been required for additional infrastructure to reduce the frequency of non-compliant events.

The implemented solution does not represent a radical departure from existing infrastructure, as it uses existing infrastructure components and augments these with new components that could be considered standard grey infrastructure solutions (CSO storage tanks, wastewater disinfection, etc.). But it represents an innovative effort to increase the effectiveness of existing infrastructure components through integrated operation.



Aarhus River before restoration



Aarhus River after restoration

DESSIN MARKETPLACE SEGNO

As part of the DESSIN project the R&D-performing SME SEGNO introduces an innovative real time control system (RTC) in a branch of the drainage area of the Emschergenossenschaft in Germany. For this task, the real time control system ADESBA is used and will be expanded. A real time control, in context of urban drainage engineering, dynamically optimizes the flows in the sewer networks and is designed to reduce overflowing of CSOs by controlling the hydraulic load in different parts of the system. It is obvious that such active control allows better utilization of the existing sewer infrastructure and the reduction of pollution discharges. Due to the dynamic operation of the real time control, it allows the sewer system to be better prepared for future changes, including the effects of climate change.

In general, real time control is complicated, time-consuming and costly. This results in a certain reluctance of water companies and consultant engineers to use the technology. Target for ADESBA is to simplify the real time control for sewer systems and to reduce the costs of implementation.

The core of ADESBA is a general control algorithm. This algorithm has been developed to be applied in a straightforward way to any dendritic sewer system. Each controllable device in the system is connected with an intelligent control box (PC unit in DESSIN) containing the algorithm. This box is being fed with system information such as water levels and flow information from the storages. Communication between the box and the storages ensures that good global control is achieved of the system by ensuring storage capacities in the system being used in an equally balanced way, thus avoiding overflows in one part of the system while other parts of the system still have unused storage capacity.

In order to improve the practical usability and security mechanisms, some extensions of ADESBA need to be developed under DESSIN. The main expansions of ADESBA contain any functions to control communication and emergency cases under the latest aspects of IT security. Furthermore, the "ADESBA Planer", a module which supports the design of the project, has to be changed to a WEB based application.

DESSIN ACHIEVEMENTS

KOEN ZUURBIER HELD DESSIN PRESENTATION

DESSIN works and aims to be known all across Europe, and on the 24th of March, it was the turn of the Netherlands to be introduced to the EU project. In the context of the conference “Knowledge for Climate to a national climate adaptation strategy” in The Hague, Koen Zuurbier, member of the KWR project team, presented DESSIN results to the conference audience.

Final results of the Dutch Knowledge for Climate research program (2007-2014) were presented, and researchers looked ahead to the implementation of new solutions that contribute to the national adaptation strategy. The use of the brackish-saline subsurface for storage and recovery of freshwater surpluses, used in the Westland Case, were the main points of Koen’s presentation. This type of ecosystem service is currently optimized and applied in practice in order to provide a sustainable and affordable freshwater supply, for instance for irrigation of greenhouses.

This event was visited by the most important actors regarding climate adaptation in the Netherlands (almost 100 of the highest governors / secretaries/consultants/water boards). By presenting the ecosystem service proposed at the Westland Demo Site, this adaptation strategy was put on the national agenda for climate adaptation. For the audience, this was a first peek at DESSIN.



The attendants to the conference. Picture by Keenis Vor Klimaat

UPCOMING EVENTS

<p>23-28 AUG</p>	<p>10th IWA International Conference on Water Reclamation and Reuse World Water Week Organizer: SIWI (Stockholm International Water Institute) Country: Stockholm (Sweden) http://www.worldwaterweek.org/</p>	<p>5-9 JUL</p>	<p>10th IWA International Conference on Water Reclamation and Reuse Organizer: Royal Dutch Water Association and IWA Country: China http://www.environmental-expert.com/events/10th-iwa-international-conference-on-water-reclamation-and-reuse-16911</p>
<p>2-6 NOV</p>	<p>Amsterdam International Water Week Organizer: Amsterdam RAI, IWA, NWP, IWC Country: Amsterdam (Netherlands) http://internationalwaterweek.com/</p>	<p>30 AUG - 4 SEP</p>	<p>Aquatic Biodiversity and Ecosystems Meeting Organizer: University of Liverpool Country: Liverpool (England) http://www.aquaticbiodiversityandecosystems.org/</p>
<p>9-13 NOV</p>	<p>The Ecosystem Services Partnership Conference 2015 Organizer: Ecosystems Services Partnership Country: Stellenbosch (South Africa) http://espcconference.org/espcconference2015#.VVxMv_6sV0x</p>		

PARTNERS

