

Project Information:

Project acronym	DESSIN¹
Title	Demonstrate Ecosystem Services Enabling Innovation in the Water Sector
Grant agreement no	619039
Starting Date	01/01/2014
Duration	48 Months

Project abstract:

The main objectives of DESSIN are:

- To demonstrate and promote innovative solutions to water-related challenges with a focus on: (i) water quality issues related to the implementation of the Water Framework Directive (WFD) and (ii) water scarcity.

- To demonstrate a methodology for the valuation of ecosystem services (ESS) as catalyser for innovation in water management. DESSIN launches demonstration projects of innovative solutions for the two challenges mentioned above, with special focus on urban areas. Solutions integrate technological, monitoring, modeling and management approaches for a more resource-efficient and competitive water sector in Europe. As a second key feature, an Evaluation Framework to account for changes in the value of ecosystem services (ESS) of water bodies that result from implementation of the solutions is being developed and applied. By adopting this twofold approach, we are able to demonstrate how innovative solutions integrated in the water cycle can increase the value of the services provided by freshwater ecosystems, thus generating additional incentives and arguments for their market uptake and practical implementation. This supports innovation and competitiveness in water management by enabling a more informed selection of the most promising solutions, as regards their impact on the water body and their economic implications. The whole project is centered around the following suite of carefully selected sites across Europe, representative of global major water challenges, where we bring together public and private water management organisations and end-users, technology providers (SMEs), supporting RTD experts and relevant public authorities to demonstrate this approach: Emscher (Germany), Hoffselva (Oslo area, Norway), Westland (The Netherlands), Athens (Greece) and Llobregat (Barcelona Area, Spain). DESSIN is coordinated by IWW Water Centre (Germany) and it is structured in five Work Areas: Work Area 1 (Evaluation Framework), Work Area 2 (Development and Enabling of Innovative Solutions), Work Area 3 (Demonstration), Work Area 4 (Bringing Innovation to Society and Market) and Work Area 5 (Project Management)

Activities of EYDAP in the project:

● Installation of small footprint, packaged, sewer mining treatment plant

A packaged plant unit consisting of an advanced Membrane Bioreactor coupled with nano-filtration and reverse osmosis membranes has been installed in EYDAP. The aim of the pilot unit is to demonstrate the use of mobile, distributed wastewater treatment units that can abstract raw wastewater from the sewer mains, treat on site and provide water for a variety of urban uses at the point of demand (including irrigation of urban green spaces). This level of reuse, termed “sewer mining” is situated between the large scale end of pipe reuse projects that require significant investment and are necessarily away from demand points and the very small scale (grey water reuse options at the household), that require personal expenses by households, providing a business driven, viable reuse option, particularly for urban green irrigation (and associated ecosystem services) in drought prone area.

● Monitoring, operation and optimization

The plant is designed to operate for a time period of 24 months in total. During this time EYDAP is monitoring the unit’s operating parameters (e.g. sludge retention time, hydraulic retention time, organic loading and additives

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employed, incl. alum, ferric chloride, polyaluminium chloride) in order to record their impact on the system's performance: (i) final effluent quality, (ii) membrane fouling (iii) system energy demand, (iv) quantity of sludge produced and (v) GHG emissions, are investigated and specific rules are developed, for use by the supervisory system

● **Distributed Reuse of treated effluent in urban environment**

EYDAP is currently implementing an ESS monitoring experiment for the urban green use of the treated water (incl. heat island effects). This activity is required in order to develop a framework for integrating multiple sources of information (satellite, local weather stations, on site monitoring, and modelling) to quantify the impact of the irrigation application at a small scale.

Benefits of EYDAP from the project:

EYDAP is constantly investing in research activities, technological development and innovation. With this particular project, a span of 2 years has been planned, so as to thoroughly test this technology from every possible aspect, pinpointing every social, financial and environmental impact. If the results of the research advocate to the financial and environmental sustainability of the pilot unit, then EYDAP will either use it in various locations for the further development and distribution of recycled water for certain activities, or cooperate with other water companies, for safeguarding water supply to areas with intermittent availability and peak demands. Additionally through this project EYDAP is gaining recognition on a research and development level and is building strong collaborations sharing expertise and know-how with prominent stakeholders in the water industry.

In the context of recognition, EYDAP participated in the National European Business Awards for the Environment – EBAE Competition, presenting the company's activities in the project DESSIN, and has been awarded in the «Product & Services» and «Business & Biodiversity» categories demonstrating the company's eco-innovation and respect for the environment at the very core of its business principles.

List of Participants:

No	Name	Short name	Country
1	IWW Rheinisch-Westfalisches Institut fuer Wasser Beratungs – und Entwicklungsgesellsch AFT MBH	IWW	Germany
2	AMPHOS 21 Consulting SL	A21	Spain
3	ADELPHI Research GGmbH	ADELPHI	Germany
4	Technisch Bureau W. M. Bruine de Bruin BV	BdB	Netherlands
5	Chemital Technology P. Dimopoulou – P. Tazes & Co OE	Chemitec	Greece
6	Ecologic Institut gemeinnutzige GmbH	ECOLOGIC	Germany
7	INRIGO Water AS	INRIGO	Norway
8	LEIF Kolner Ingeniofirma AS	LKI	Norway
9	SEGNO Industrie Automation GmbH	SEGNO	Germany
10	TELINT RTD Consultancy Services LTD	TELINT	United Kingdom
11	UFT- Umwelt-und fluid-technik Dr H Brombach Gesellscaft mbH	UFT	Germany
12	EmscherGenossenschaft	EG	Germany
13	Etairia Ydreuseos Kai Apochetefseos Proteyousis Anonimi Etairia	EYDAP	Greece
14	Oslo Kommune	VAV	Norway
15	CETAqua, Centro Tecnológico del Agua, Fundacion Privada	CETAqua	Spain
16	DHI	DHI	Denmark
17	KWR Water B.V.	KWR	Netherlands
18	National Technical University of Athens	NTUA	Greece
19	Siftelsen SINTEF	SINTEF	Norway
20	Universitaet Duisburg-Essen	UDE	Germany