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D41.4 ESTABLISHED SHOWCASES AT FIVE DEMO SITES

Emscher (Germany), Hoffselva (Norway), Westland (The Netherlands), Athens (Greece), Llobregat (Spain)

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SUMMARY

This deliverable describes the development and establishment of showcases in each of the DESSIN demonstration sites. Each of the showcases was set up in a distinct way, reflecting the local conditions, target audiences and wishes. The overall objective of the showcases is to promote the uptake of the innovative solutions enhancing ecosystem service, developed in DESSIN, and show relevant stakeholders, authorities, decision makers, researchers and the general public their potential. The showcases also provide a playground for new technologies to be demonstrated in a real life environment. The showcases have a clear role during the DESSIN project, but we also foresee active showcases beyond the DESSIN lifetime to endorse the uptake of the innovative solutions. The showcases will be finalised and updated in the last year of DESSIN.

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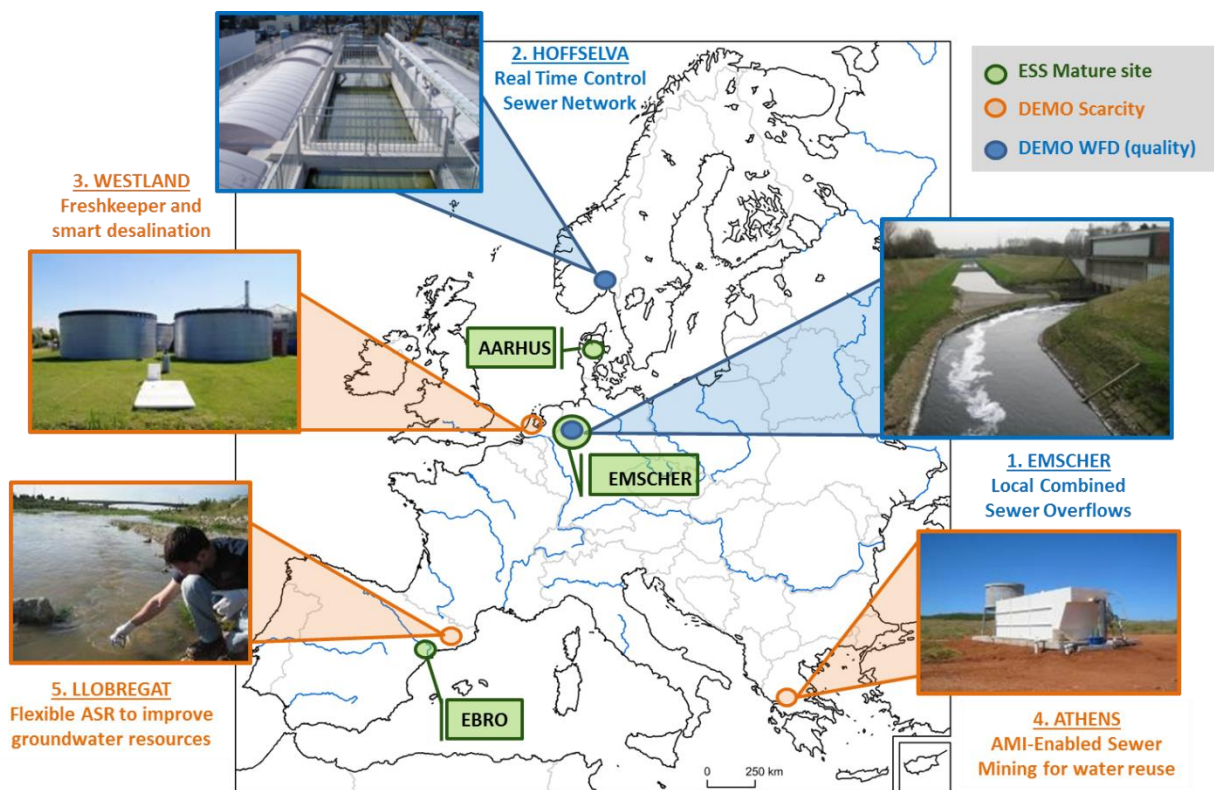
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1. Introduction

To promote the market uptake of the innovative solutions from DESSIN, the five demo sites, Emscher (Germany), Hoffselva (Oslo area, Norway), Westland (The Netherlands), Athens (Greece) and Llobregat (Barcelona Area, Spain), are established as showcases. These showcases enable potentially interested technology providers (SMEs), public authorities, public and private stakeholders and the general public (including students) to experience the ecosystem service enhancing concepts in practice and thus act as reference sites in Europe. The showcases thus contribute to promote DESSIN solutions in the selected demonstration regions, as well as nationally and internationally. Within DESSIN in each of the demo sites a number of activities for targeted groups, as well as meetings (such as an official opening) are organised in close cooperation with site owners and responsible consortium partners. Although the showcases build on the experiences from DESSIN, they are expected to exist beyond the lifetime of the project, thus securing the potential market uptake of DESSIN outcomes.



Location of the five DESSIN showcases in Europe

2. Emscher showcase (Germany)

The Emscher showcase aims to address people interested in the DESSIN project as well as water boards, cities (sewer system operators/owners), and technology applicators as target audience. To this end, the most promising communication platforms identified were the websites of DESSIN, UFT, SEGNO, and of regional governments and the European Commission in parallel to presentations at fairs (especially for the SME). This was preferred over on-site showcases because the lamella-settler is not a constant but only temporary installation and the RTC is hardly visible.

For these reasons and in order to effectively communicate the approach, three short movies are produced. Key message is “How innovative technological solutions help improve ecosystem service provision in dense urban areas.” The three movies describe subsequently:

- 1) The Emscher area and its reconversion and restoration process as well as the improvement of ecosystem services in the area going along with it but also the challenge of combined sewer overflow concerning water quality goals.
- 2) The demonstration of a decentral treatment of combined sewer overflow via a lamella settler solution, including an animation of the functionality of the technology and pictures of the pilot installation. It is explained how the solution can improve water quality, and thus, enhance ecosystem services in the area even more.
- 3) The demonstration of a Real Time Control system via the ADESBA solution, including an animation of the technology. Also here it is explained how the solution can improve water quality, and thus, enhance ecosystem services in the area even more.

The DESSIN Emscher showcase is part of the bigger Emscher reconversion project and is therefore disseminated also through existing channels, e.g. the EG website, at EG internal and external meetings and conferences. Information about the current status on the two technologies has been made available on the DESSIN website throughout the demonstration phase:

Baptism of DESSIN cross-flow lamella settler container „Claire II“

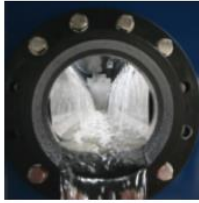
Published April 22, 2015 | By Admin

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Within DESSIN, the technique of cross-flow lamella settling will be demonstrated at the Emscher demo site in Germany and, in 2016, at Hoffselva in Norway. The German project partner UFT has recently completed a mobile test container, which has been baptized „Claire II“ on the 1st of April on the UFT premises at Bad Mergentheim. It will be installed at the Emscher demo site in Castrop-Rauxel within the next couple of weeks.

The demonstration container has a volume of around 25 m³. It will be placed close to a combined sewage overflow tank. During rain events, combined sewage will be pumped into the vessel. It features two cross-flow lamella modules with a projected lamella surface of 33 m². The settling solids in the combined sewage will settle on the large surfaces and the overflowing water will thus be mechanically pre-treated. A thorough measurement, sampling and evaluation programme will be conducted by the project partners University of Duisburg-Essen and EmscherGenossenschaft as facility operator.



Ceremonial baptism of Claire II by godmother Dr. Angela Weiss. The champagne is not drizzling too well, but we don't think that this is a bad omen...

“News” entry on the DESSIN website published on April 22nd 2015.

Emscher demo case: Real-time-control (RTC) of sewer network ready for implementation

Published July 1, 2016 | By Admin

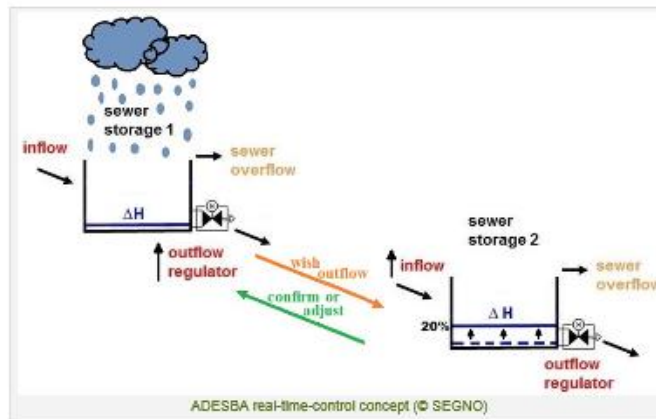


The two demonstration technologies in the Emscher case focus on water quality issues. Aim is to decrease the amount and improve the quality of combined sewer overflow (CSO) into recipient rivers.

Five CSO facilities in the upper Emscher river section are now ready for implementation of the RTC system ADESBA. The function of the ADESBA communication software is the optimal utilization of the entire available underground storage volume. The final aim is to reduce pollutant input into streams by reducing the overflow frequency and volume from CSOs into streams.

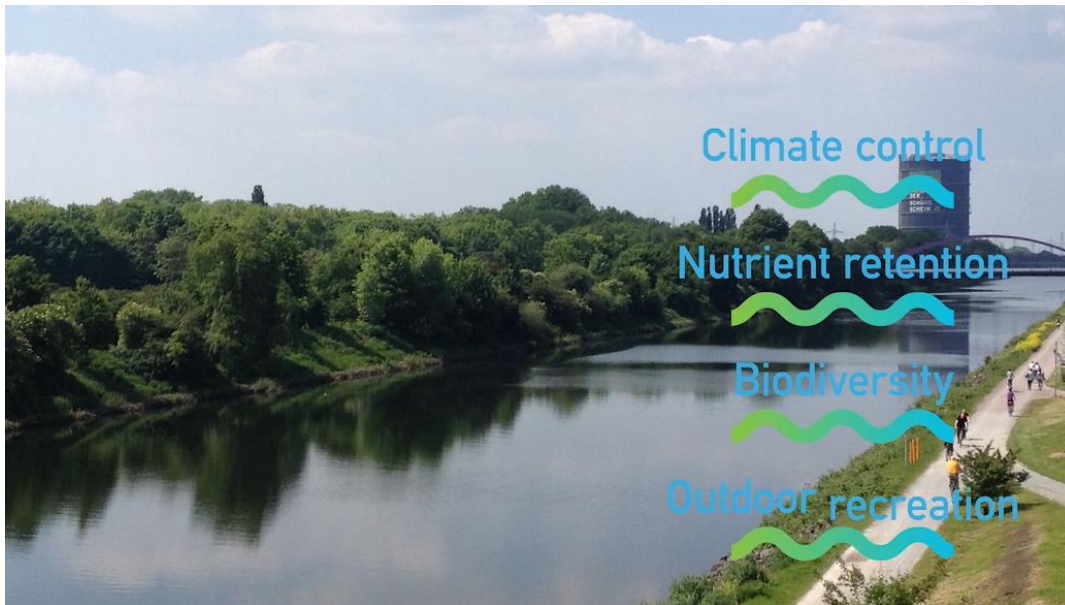
To fulfil the preconditions, all facilities had to be equipped with online communication systems and their internal programming had to be adapted. One of the facilities required an additional outflow regulator. Simulations based on historical data and modelled data were run. Furthermore, safety functions were incorporated.

After a testing phase, the actual control operation will be initiated. During the entire pilot phase, the system's performance will be monitored. Based on these findings, predictions on the effects on the ecosystem and its services will be made. Milestone 23 of the DESSIN project has been reached with these actions.



Outflow regulator in a combined sewer overflow facility (© EGLV)

“News” entry on the DESSIN website published on July 1st 2016.



Screenshot of the first movie on the Emscher area, its reconversion, on ecosystem services, and the challenge of CSO.



Screenshot of the animation of the challenges linked to CSOs in the first movie



Screenshot of the animations of the Lamella Settler as used in the second video



Screenshot of the scene on the Lamella Settler demonstration unit in the second video

3. Hoffselva showcase (Norway)

The Hoffselva showcase consists of the demonstration site and activities and means for spreading information about the technologies, the ESS evaluation and the DESSIN project, and dissemination of results from the demonstrations.

The showcase is tailored to the needs arising from the local conditions where the stakeholders in the area are organized in an association 'Hoffselvas venner', and the interests and needs of VAV and the participating SMEs.

After the opening of the demo site, there have been information meetings with local stakeholders, the end user and interested suppliers in addition to the SMEs participating in DESSIN.

The technologies and ESS evaluation approach have been presented to the Norwegian water sector at a 'VAnnforsk' (Norwegian association for stakeholders in water research) event. Future events include 'Kursdagene' in January 2017 (major yearly event at the technical university, NTNU, targeting consultants, suppliers and end users), meeting with Hoffselvas venner in January/February 2017 and 'Vannbransjens innovasjonkonferanse' in March 2017 (the Norwegian water sectors innovation conference).

The end deliverable from the demonstration will be a seminar at VAV, which will also be one of the activities in the Hoffselva showcase.



Establishment of the demo site with the first demo plant from Inrigo.



Meetings with stakeholders, SMEs and end users



Extension of the demo site with the UFT plant in 2016 and detail of information poster

Citizen science: Friends of Hoffselva

The Hoffselva showcase plays a central role in the discussion on ecosystem service improvement in the Hoffselva and broader Oslo region (use and non-use value for residents and visitors). Main question is in what way an improvement of the water quality will have a positive effect on the livability of the area and what would be acceptable costs for this. Key in the Hoffselva showcase is the involvement of citizens in the ongoing research activities (citizen science), as observers of the water quality (that is combined with actual measurements). Observations are collected for 7 observation points along the Hoffselva river during 'normal' conditions and during CSO events, using a log form and a number of photos. At each observation point the water depth is measured and information is collected on time of observation, weather conditions, amount and flow of water, appearance of water (colour, turbidity, natural & human-made material), condition of river banks, smell, number of people in the area, own activity (leisure, way to work, shopping, etc.), total impression and general experience of being by the river (positive-negative).



One of several 'river forums' in Oslo, about 120 members, resourceful enthusiasts

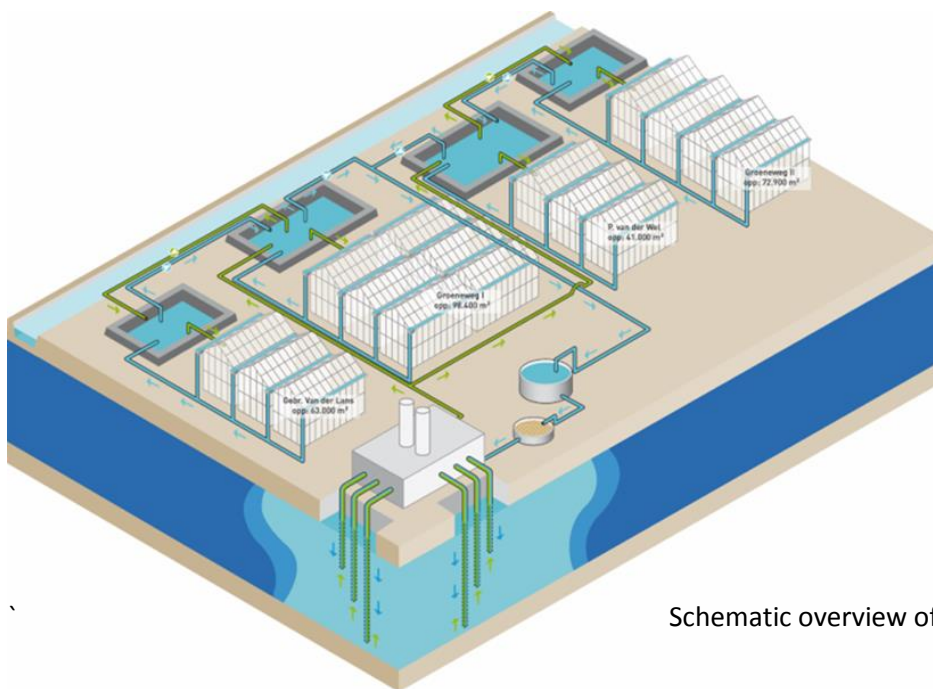
4. Westland showcase (The Netherlands)

Within DESSIN, the Westland demonstration site has been developed into a fully functioning showcase. The showcase includes a guided tour along the different objects of the facilities at the demo site, a mobile banner exposition of the different technologies applied at the site, and also promotes and enables testing of novel, additional technologies, equipment and methodologies.

The Westland showcase is located within the facilities of the Prominent Innovation Centre in 's Gravezande in the Westland, the large greenhouse area between the cities of The Hague and Rotterdam in the near coastal Western part of the Netherlands (Greenport Westland). The Innovation Centre promotes the development and demonstration of new technologies for the horticulture sector in the Netherlands and worldwide, and as such is an ideal 'partner' for DESSIN, providing showcase support, such as a meeting room (with presentation facilities) for visitors.



Prominent Innovation Centre



Schematic overview of the pilot setup

Official opening

The Westland showcase was officially opened on 28 August 2015 with the attendance of high level representatives of relevant stakeholders and decision makers. Since the start of the research activities at this site, many (international) groups of interested scientists, potential users, water managers, investors, and politicians have visited the showcase.

Almost 400 people visited the Westland demosite in 2015

Published January 25, 2016 | By Admin

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Since the transformation of Westland demosite to a complete Showcase (including information panels, instruction movies, guide tours and scale model) in the second half of 2015, almost 400 visitors were welcomed. These visitors included stakeholders, scientists, water managers, students, and neighbours. The size of visiting groups also showed an interesting variation: from 4 (geohydrologists from Rotterdam) to 24 (student excursion) to 120 persons (IAHR Congress, held in Rotterdam).

The largest Dutch industrial parties visited the showcase in December 2015. Despite their significant water consumption, this was the first time they were informed on the potential of the subsurface to provide temporal storage reservoir.

In May 2016, the visitors of the [Adaptation Futures Conference](#) will visit the site during a field trip and in March 2016 the DESSIN consortium will visit the demo-site during a project meeting.



During the official opening of the Showcase in August 2015

Demonstration, documentation, and evaluation at the Westland site

Published November 15, 2016 | By Admin

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Like in 2015, the Westland demosite for aquifer storage and recovery in combination with reverse osmosis (ASRO) still is a unique site to demonstrate, document, and evaluate this water innovation.

Demonstration

Plenty of scientists, policy makers and water users find their way to the site. For instance, a meeting was organised together with the Rabobank (financing most Dutch horticulturists) at September 16th. During this meeting interested agriculturists from the area visited the site for presentations on the technique, but also on interesting ways to finance this type of sustainable innovations. A delegation from Vietnam was welcomed on October 13th, while on October 24th delegates from the Gulf Cooperation Council visited the site to explore its potential for the Gulf States. Both regions suffer from saline groundwater and a lack of storage opportunities aboveground. These latter visits were arranged together with the Netherlands Enterprise Agency (RvO).

Promotional material

To promote the technologies demonstrated at the Westland demo site a suite of promotional material has been developed within DESSIN in cooperation with the Valorisation Program Deltatechnology in The Netherlands, and includes videos, banners, posters, publications, as well as attractive illustrations. The showcase is also promoted as Waterbuffer Showcase by the Waterbuffer Foundation (Stichting Waterbuffer).



Banners

Supporting **videos** are available through the DESSIN website, as well as other websites (Waterbuffer Foundation, KWR Watercycle Research Institute).



Screenshot of the Westland **video** explaining the technologies demonstrated



Attractive illustrations explaining the technological approach demonstrated

Walking route with information boards

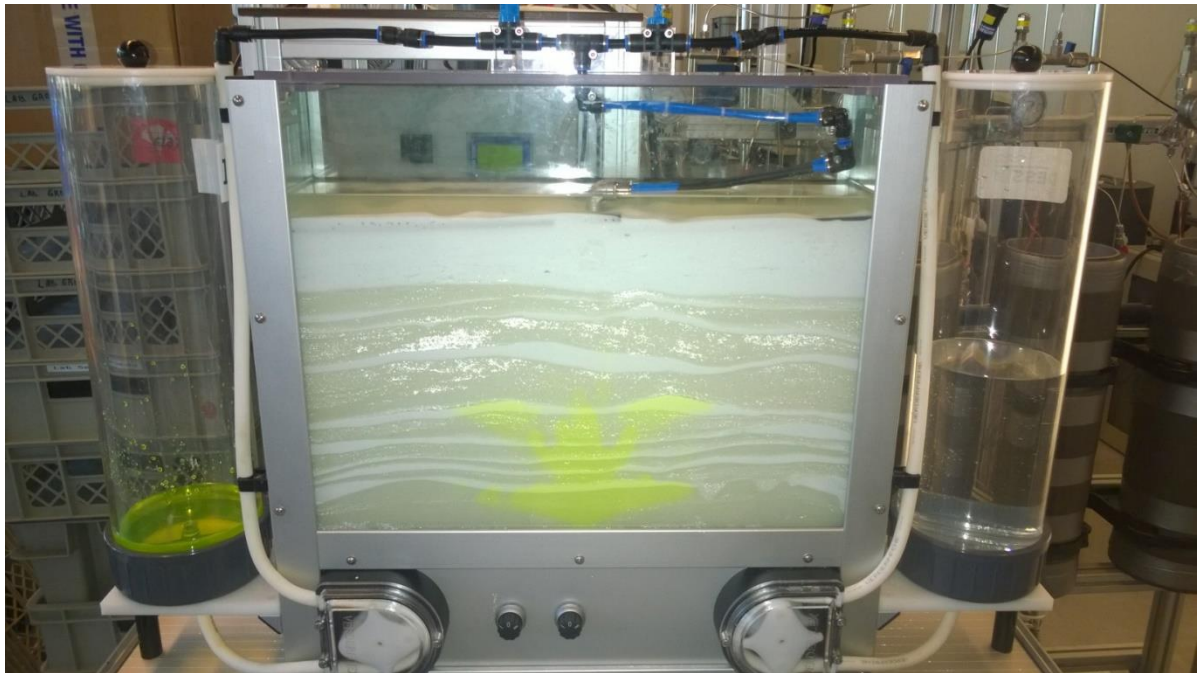
The demo site is largely self-explanatory, because a walking route with information boards has been developed and installed on site. Each step in the process (infiltration, extraction, treatment, etc.) is explained in English and Dutch and supported by graphics). There is also the opportunity to arrange a guided tour.



Information Boards

Sandbox scale model

The subsurface is often considered a black box. To visualise the actual processes (water flows, mixing of water types etc.) in the subsurface upon storage and recovery of freshwater volumes within DESSIN a (mobile) sandbox scale model has been developed that is used during presentations and in meetings etc. to show the principles of the ASR based technology applied in the Westland showcase, as well as in the Llobregat showcase. The scale model includes two water reservoirs representing freshwater and saline water that can be supplied to a model aquifer, mimicking mixing of fresh and saline water upon ASR application in coastal areas.



Sandbox scale model

Promoting national and international cooperation

The DESSIN showcase promotes the further use of the subsurface for temporary storage of freshwater to deal with seasonal changes in freshwater supply and demand. As the demonstration has developed into a full scale system supplying a number of horticulture (glass house) owners with freshwater, it is now considered and recognised as a successful example for application of ASR in near coastal areas worldwide. As such the showcase is visited by many national and international groups of interested groups of people, and thus it also links to other initiatives. Currently, the showcase is linked to the Dutch Delta Programme Freshwater that aims to secure the future freshwater demand of the Netherlands.

[19]

5. Athens Showcase (Greece)

The Athens showcase acts as demo facility for water innovations. The Athens showcase supports on-site visits, by developing an information board, leaflets, targeted presentations and a dedicated website, as well as dissemination material including an animated movie showing the concept to potential target groups (authorities, tourist industry and general public). The main goals of the showcase are to

- become acquainted with the idea of sewer mining
- get to know what the unit looks like, how the unit works, what is innovative about it and how it performs
- present various applications of sewer mining (and the benefits)

On-site visits

Visits that have already taken place :

- TAIPED, in order to give permission for a similar unit (for the SUBSOL program)
- Academics and students
- Agencies

Future visits are foreseen for:

- Municipalities and municipal water companies (DEYAs).
- Schools, Universities
- Industrial/commercial partners

The Athens showcase supports visits by:

- Presentation in R&D's conference room
- Touch and feel observation of the unit and description of the main processes taking place (in plain words)
- Presentation of the control room and explanation of the innovative use of ICT solutions for control and monitoring
- Tour on the "heat island" pilot area



Impression of the sewer mining demo location in Athens

A green business award for DESSIN & EYDAP

The Athens Water Supply and Sewerage Company (EYDAP) won a prestigious award for DESSIN increasing the value of the pilot as a high profile showcase. EYDAP participated in the European Business Awards for the Environment (EBAE) and excelled at the National level. The Panhellenic Association of Environmental Protection Enterprises (PASEPPE) together with the EU Representation in Greece awarded EYDAP two prizes for the Athens sewer mining pilot, in two categories:

- Products & Services Award
- Business & Biodiversity Award

EYDAP and its partner institutions in DESSIN (NTUA, CHEMITECH and TELINT), promoted the idea of an innovative small footprint sewer mining packaged treatment unit for urban reuse enabled by Advanced Monitoring Infrastructure (AMI) and Decision Support System (DSS). The pilot unit stood out for its demonstration of 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.

The ceremony took place at the Eugenides Foundation on the 19th of October 2016 in the presence of the Minister of Interior & Administrative Reconstruction, Mr. Panagiotis Kouroubilis and the Minister of Environment, Mr. Yannis Tsironis. Overall, 9 companies were awarded, all of them continuously promoting innovation, sustainable development, circular economy and environmental protection in the last 2 years.



The President of EYDAP's Board of Directors receives the prize and stresses the innovation character and potential impact of DESSIN.

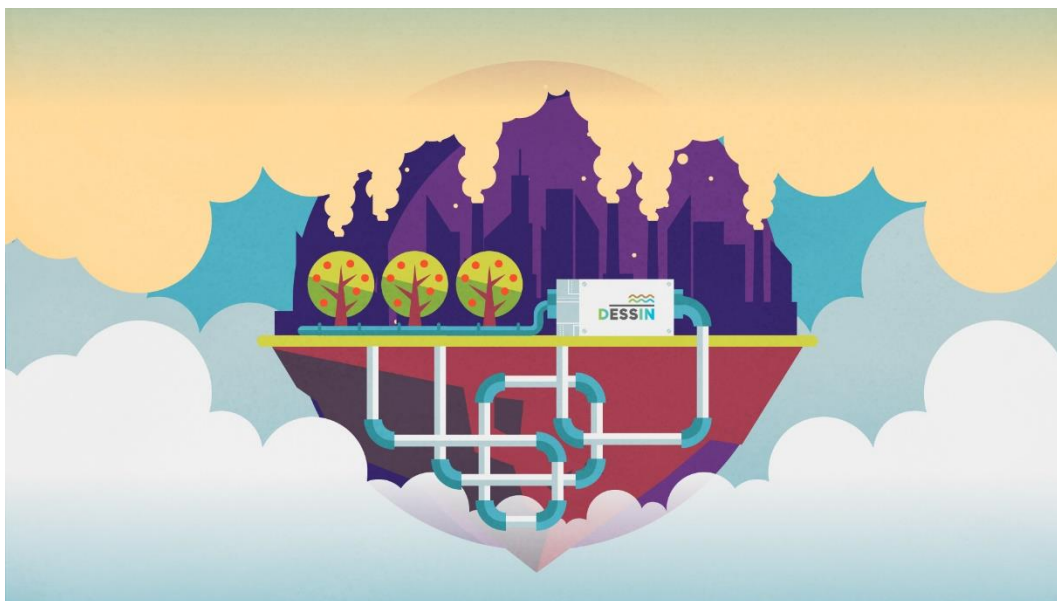


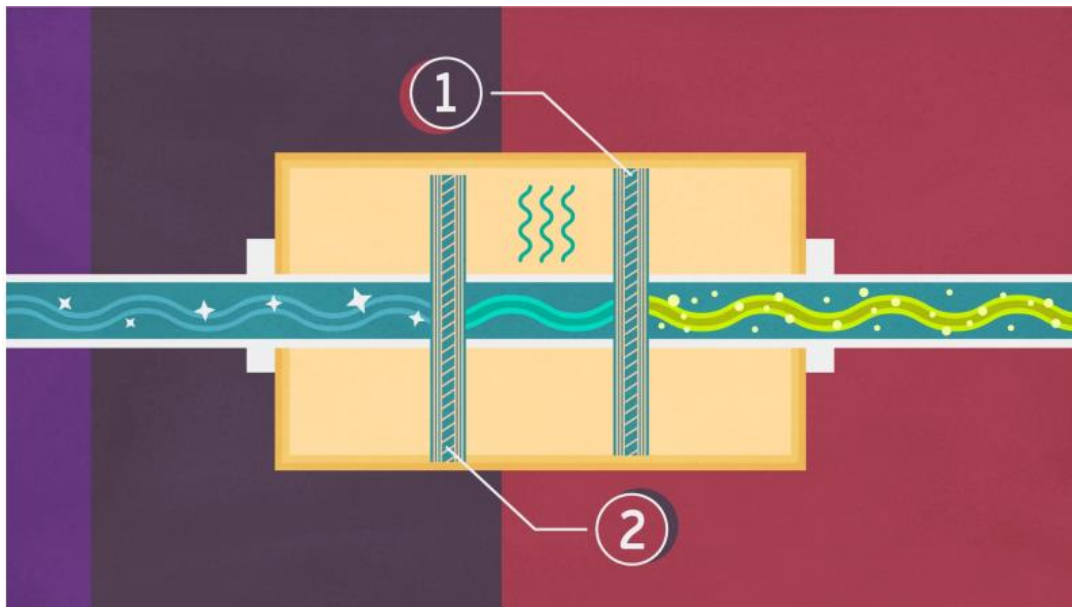
The EYDAP team displaying the two prizes in front of the Company's stand in the PASEPPE awards.

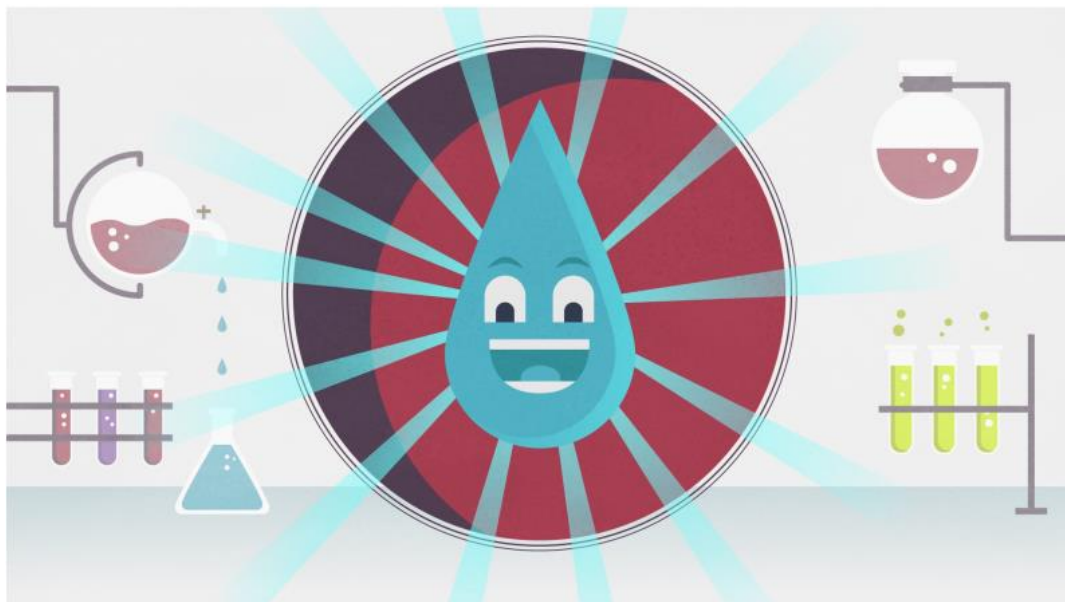
Animation

An animation is developed that will be broadcasted through popular websites, such as YouTube, in order to increase public awareness. The main objectives of the animation are to:

- Link sewer mining with the need of solutions on **water scarcity**
- Roughly **explain the operation** of a sewer mining unit
- Inform about how a widespread implementation of sewer mining in highly urbanized cities can **improve citizens' quality of life**









Sample style frames of the Athens animation.

6. Llobregat showcase (Spain)

The demo site at Llobregat is located at the drinking water treatment plant (DWTP) facilities Sant Joan Despí and is easily accessible for all visitors of the water company, which supports the development of a DESSIN showcase. The showcase includes a.o. a notice board, a digital totem and on-site visits and builds on and supports activities of the water company Aigües de Barcelona.

Notice Board

A Notice Board explaining the principle of Aquifer Storage and Recovery and the application at the demo site is located next to the DESSIN well at Sant Joan Despí DWTP.



Notice Board

Digital Totem

A digital totem has been installed in the hall of the Sant Joan Despí DWTP. On the digital totem several projects and pilots, including DESSIN, are shown daily.



En busca de solucions a la sequera amb l'ús addicional de l'aigua subterrània

Sabies que...?

- El 10% de l'aigua que es tracta en aquesta planta prové de l'aqüífer i que de vegades prové exclusivament dels pous?
- El projecte **DESSIN** busca millorar les tècniques de *recàrrega de l'aqüífer*, per poder aprofitar de forma més eficient l'aigua subterrània.

Com s'aconseguirà?

- Injecció d'aigua als pous amb aigua filtrada per sorra.
- El repte consisteix en avaluar l'**impacte físico-químic** en l'aigua subterrània i demostrar-ho en un dels pous de la ETAP.
- S'avaluaran els **beneficis ambientals i econòmics** de l'ús de l'aigua subterrània.

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PP7-ENV-2013-WATER-INDO-DEM-0 619035

Impression of the digital totem and content

Visits at DWTP of Sant Joan Despí



Impression of visits at DWTP of Sant Joan Despí

Sant Joan Despí DWTP also hosts visits of students from schools, high schools and institutions. The amount of visits annually is impressive, e.g. over 200 groups of school children (with over 5000 students).



School visits to Sant Joan Despí DWTP

Photo session

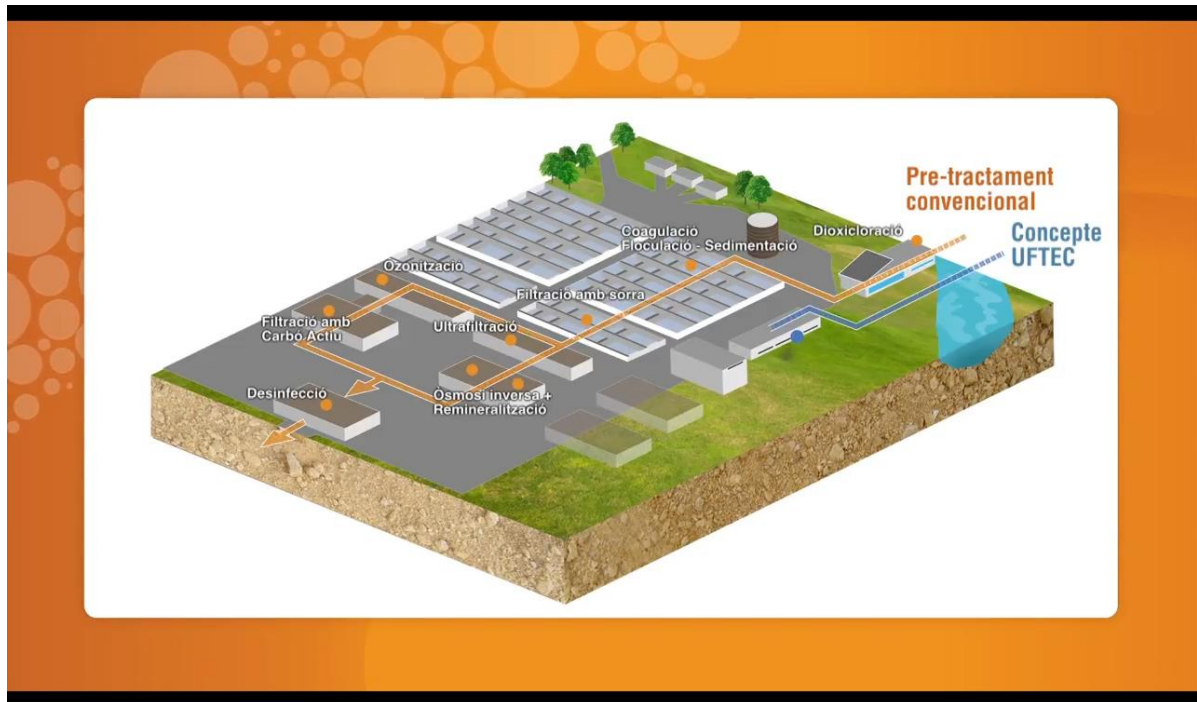
A photo session of the DESSIN Demo Site at Sant Joan Despí was held at the beginning of March 2016. These photo's give a good impression of the research activities at the demo site and can support different showcase activities. Some examples are shown below.



Impressions of the DESSIN activities at Sant Joan Despí DWTP

Video

Besides the full project video, the Llobregat Demo Case will have its own video, detailing the works done, goals accomplished and future objectives of DESSIN project in Barcelona.





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