



LIFE CERSUDS - Ceramic Sustainable Urban
Drainage System

LIFE15 CCA/ES/000091



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Project description:

Background

Combined sewers are those that, in addition to industrial and domestic wastewater, also collect surface runoff. Widely used throughout Europe, they pose the risk of combined sewer overflow spills, incidents that challenge the capacity of Member States to meet the water quality goals of EU legislation, including the Urban Waste Water Treatment Directive and the Water Framework Directive.

Surface water drainage in dry areas of Spain has traditionally been overlooked and considered a secondary component of combined sewers, rarely relevant except during periods of torrential rainfall. This attitude, along with rain patterns which differ greatly from those in countries where the principles of sustainable drainage have been widely implemented, might partially explain the relative lack of sustainable urban drainage systems (SUDS) in Spain.

SUDS involve a range of structural components (ponds, basins, swales, infiltration systems) and non-structural responses (cleaning programmes, amended regulations) designed to ameliorate the otherwise degrading effects of older, conventional drainage systems.

One of the EU's priorities is to adapt urban areas to climate change by using green infrastructure, such as SUDS (EEA Technical report No 15/2011 - Green infrastructure and territorial cohesion). Furthermore, it is clear that such solutions provide additional benefits such as ecosystem services.

Objectives

The main objective of LIFE CERSUDS is to improve the resilience of cities to climate change and promote the use of green infrastructure in their urban planning as a means of managing surface water flooding. It aims to achieve this through the development and implementation of a demonstration low-carbon SUDS. The system will consist of an innovative permeable surface with a very low environmental impact, based on the use of tiles with low commercial value.

Specific objectives are as follows:

- To reduce flooding caused by torrential rain by increasing the number of permeable surfaces in cities;
- To reuse water stored during the rainy season for use during periods of drought;
- To reduce runoff volumes and peak flows which to treatment plants and receiving water bodies;
- To integrate treatment of rainwater into the urban landscape;
- To protect water quality by reducing the effects of diffuse pollution and so avoid problems in sewage treatment plants;
- To reduce CO₂ emissions linked with the manufacture of pavements for SUDS, given that the project will use ceramic materials with low commercial value, giving ceramic tiles manufacturers a new revenue stream;
- To provide a SUDS with an aesthetic-quality finish and to prevent ponding, increasing the comfort and safety of streets in rainy weather;
- To develop a ceramic SUDS with greater environmental efficiency;
- To demonstrate that this ceramic SUDS is suitable for rehabilitating urban areas with light traffic and to enable better management of rainwater in areas with particular geo-economic conditions;
- To guarantee transferability beyond the end of the project through training activities and a business plan aimed at engineers, architects and companies, and by increasing local authorities' awareness; and
- To generate precise technical documentation to facilitate replication in other cities based on the principles of the LIFE CERSUDS demonstrator.

Expected results: The project expects to achieve the following results: • A reduction in runoff through the use of permeable pavements with volumetric yield close to 90%. This will increase resilience to flooding; • A replicable demonstrator with storage capacity for rainwater which can be reused as irrigation water to maintain public spaces in periods of drought. When rainfall is high and the tank filled, the excess water will be redirected to the storm water network; • A major reduction in diffuse pollution and improved water quality compared to traditional systems. The contaminant removal efficiency can be expected to reach more than 70% for hydrocarbons, over 50% for phosphorus, more than 65% for nitrogen and above 60% for heavy metals; • Significant CO₂ emissions reductions through the use of stored ceramic material (408 tonnes) with low commercial value to pave the entire surface of the demonstrator (3 000 m²), compared to existing solutions with draining concrete pavement (5 cm layer); Technical documentation on the functioning of the demonstrator and the results achieved to help local and regional governments across Europe include this type of green infrastructure as an option in their urban planning; • Educational materials on ceramic drainage to be disseminated via the six

Ceramic Chairs of European Architecture (in Spain, Germany and UK); • More green surfaces in the demonstration area will be irrigated by stored rainwater; • Improved pedestrian safety by reducing the slipperiness of the pavement to a Pendulum UNE-ENV 12633 value of 45 to 65; • A reduction in the urban heat island effect through evaporation of water collected; and • A significant increase in turnover and employment in the ceramic industry in Spain and in other countries targeted for replication of the project, and the creation of new qualifications in this industry.

Results

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Environmental issues addressed:

Themes

Climate change Adaptation - Resilient communities

Keywords

Mayors Adapt, public-private partnership

Target EU Legislation

- Climate Change & Energy efficiency
- COM(2011)112 - "A Roadmap for moving to a competitive low carbon economy in 2050" (08.03.2011)
- COM(2013)216 - EU Strategy on adaptation to climate change (16.04.2013)
- Nature protection and Biodiversity
- COM(2013) 249 final "Communication from the Commission on Green Infrastructure (GI) - Enhancing E ...

Natura 2000 sites

Not applicable

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Beneficiaries:

Coordinator	ASOCIACIÓN DE INVESTIGACIÓN DE LAS INDUSTRIAS CERÁMICAS
Type of organisation	Research institution
Description	The Instituto de Tecnología Cerámica (ITC) was established in 1969 by the Ceramic Industry Research Association (AICE) and Universitat Jaume I (UJI) of Castellón. Its goal is to contribute to the technological development of the Spanish ceramic tile manufacturing industry. ITC has significant experience of working in partnership with SMEs, helping them to develop new, socially useful products at competitive prices.
Partners	Consorzio Universitario per la gestione del Centro di Ricerca e Sperimentazione per l'industria ceramica - Centro Ceramico, Italy CHM OBRAS E INFRAESTRUCTURAS S.A., Spain TRENCADIS DE SEMPRE, S.L., Spain Centro Tecnológico da Cerâmica e do Vidro, Portugal UNIVERSITAT POLITÈCNICA DE VALÈNCIA, Spain AYUNTAMIENTO DE BENICASSIM, Spain

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Administrative data:

Project reference	LIFE15 CCA/ES/000091
Duration	01-OCT-2016 to 30-SEP -2019
Total budget	1,817,972.00 €
EU contribution	986,947.00 €
Project location	Comunidad Valenciana(España),Emilia-Romagna(Italia),Centro(Portugal)

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