ATHENS, GREECE Reclaimed water for irrigating the city's nursery

The tree nursery of Athens supplies vegetation for all urban parks and green spaces of the city. The nursery, located in the Goudi Park at the city centre, has been using potable water from Athens's Water Supply and Sewerage Company (EYDAP) for the irrigation of 4 ha. Due to increased urbanisation and severe climatic conditions, Athens is motivated to reduce pressure on water resources by reducing water demand. To this end, a pilot unit will be fed with wastewater from the urban sewer network that passes under the nursery; the wastewater will then be treated and reused at the point of demand for the nursery's irrigation and other non-potable uses. The target is to have a recycling rate of about $25m^3/day$.

LIMASSOL, CYPRUS Reclaimed water for groundwater recharge and irrigation

The wastewater reuse system of Limassol, the second largest urban area of Cyprus, with 165.000 population equivalent, is in operation since 1995. The high quality effluent with an annual flow of about 9 million m³ is mainly recycled and used for purposes such as groundwater recharge and restricted irrigation of public amenity areas, football fields and roadsides. Only during the winter period when the demand for irrigation is limited, a minor quantity of the tertiary effluent is discharged to the sea.

Become a water-smart city, too!

- Reclaim your wastewater
- Extract precious resources
- Check health and safety standards
- Develop a holistic water reuse plan
- Use fit-for-purpose water in urban irrigation and cleaning



Project coordination: **AIMEN Technology Centre** Duration: June 2016 to July 2019





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INCOVER

Innovative Eco-Technologies for Resource Recovery from Wastewater



Wastewater is too precious to waste!

Wastewater is too precious to waste!

Reclaimed water for municipal services

As urbanisation rates accelerate, and the impacts of climate change materialize, the demand on freshwater resources increases and it becomes more urgent to explore alternative water resources and new ways to save water. The use of reclaimed water for nonpotable purposes provides one such alternative that helps reduce demand and alleviate the strain on freshwater abstraction.

Benefits for cities

Reclaimed water¹ can be an integral part of a city's overall water conservation effort providing multiple benefits:

- It provides an alternative to freshwater supplies, contributing to water-saving
- It decreases the diversion of water from sensitive ecosystems and reduces effluent discharges into water bodies
- It helps recharge aquifers, minimizing negative effects to underground resources
- It is a drought resistant source of irrigation

The multiple benefits of water reuse should be communicated widely to foster the understanding that wastewater is not an environmental nuisance, but rather a welcome resource.

1 Reclaimed water is urban wastewater that has been treated in compliance with the EU's requirements set out in Directive 91/271/EEC and which results from further treatment in a reclamation plant.)

How can cities use reclaimed water?

Municipalities can use reclaimed water in various ways, as for:

- irrigating vegetated areas (gardens, parks, road verges, schoolyards, cemeteries, green roofs, green walls, etc.)
- Cleaning purposes (municipal fleet washing and street cleaning)
- Landscape design and urban recreational grounds
- Toilet flushing in municipal buildings
- Firefighting
- Urban environmental enhancement such as maintaining urban stream flows and wetlands
- Municipal cooling and heating systems

Experiences from European cities

Many cities in Europe already practice water reuse water successfully; among them Palma de Mallorca (Spain), Lisbon (Portugal), Limassol (Cyprus) and Athens (Greece).²

2 The sources of information for this leaflet are the European Project Watertime, the Urban Water Agenda 2030, the European Green Capital Award, the European NextGen Project and Water Development Department of the Ministry of Agriculture, Rural Development and Environment of the Republic of Cyprus

PALMA DE MALLORCA, SPAIN A comprehensive Urban Wastewater Reuse Plan

Since the fifties, Mallorca's water resources have been affected by large-scale tourism and resulting seasonal peaks in water consumption. The island is mainly supplied by groundwater. The water deficit can only be balanced through non-conventional practices, like seawater desalination or the use of reclaimed water. Especially in the city of Palma, the latter has become a relevant alternative resource already in the 1970s, when treated wastewater started to be applied for agricultural irrigation.

During the 1990s, the municipal water company EMAYA launched the implementation of an Urban Wastewater Reuse Plan in Palma, which contributed to major water resource savings. By 2001, via the use of reclaimed water for cleaning streets and irrigating gardens, Palma had already reduced drinkable water consumption by 20%.





LISBON, PORTUGAL Reclaimed water for urban irrigation and cleaning

The intensive collaboration between the Lisbon Municipality and its public utility EPAL (Empresa Pública das Águas Livres) has led the city to reuse over 1.5 million m³/year of recycled wastewater from Lisbon's wastewater treatment plants (WWTPs) for non potable uses. Lisbon is committed to increase its reuse so as to achieve a target of 50% by 2020.

Considering that municipal garden irrigation and street cleaning together represent 75% of the municipal water consumption, Lisbon aims at using reclaimed water for green area irrigation through the installation of a complete recycled water infrastructure network that connects the WWTP with the Parque das Nações and the Alcântara Valley, two important urban green areas. The "Parque das Nações" Project aims to replace underground water for irrigation by recycled treated water from the Beirolas WWTP. The "Alcântara Valley-Green Corridor" is a restoration project of 13ha along 3km that will resurface a river, create a wetland park, plant over 700 trees, build cycle-pedestrian corridors, and create new green areas to be irrigated with reclaimed water.

With regard to street cleaning, regulatory municipal procedures and agreements were established with the WWTPs for them to provide treated wastewater to the municipal cleaning fleet.