

Towards a next generation of water systems and services for the circular economy

Water cycle activities

Material cycle activities

Energy cycle activities

Abstract

Within the framework of the Horizon 2020, a European project called NextGen evaluates and champions transformational circular economy solutions and systems around resource use in the water sector. The Athens demo site is located in the Athens Urban Tree Nursery which is part of the Goudi Park, an area in the process of redevelopment and regeneration to become one of the key metropolitan parks of the capital. The innovations that are being implemented within the project are the installation of a sewer mining modular unit for urban green irrigation at the point of demand with a capacity of 25m³/d. Additionally, compost-based eco-engineered growing media products will be reused as an onsite fertilizer, as part of a portfolio of autonomous, decentralized water, energy and materials circular solutions for cities in water scarce area. The project mobilizes a strong partnership of water companies, industry, specialized SMEs, applied research institutes, technology platforms, city and regional authorities and builds on an impressive portfolio of past research and innovation projects, leveraging multiple European and global networks guaranteeing real impact.

The installation of the Sewer Mining modular unit for urban green irrigation at the point of demand, would be of direct benefit for the sustainability of the new Metropolitan Park. Additionally, biomass produced from sludge treatment, can be treated and reused as fertilizer onsite as part of a portfolio of autonomous, decentralized water, energy and materials circular solutions for cities in water scarce areas.



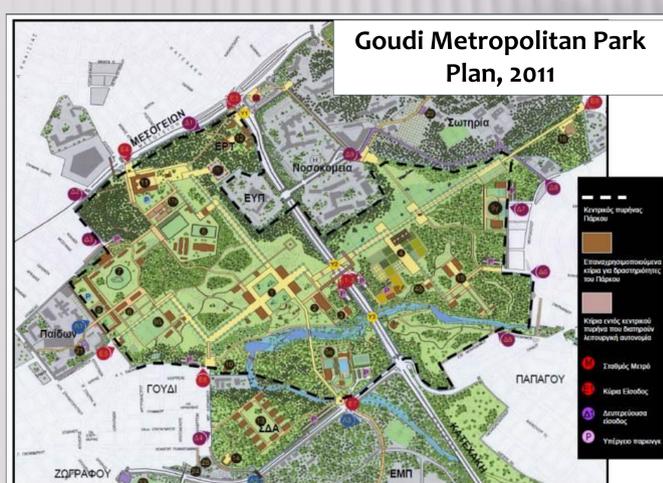
Athens Urban Tree Nursery

The Nursery, comprising of 4 ha of vegetation, is supplying all urban parks and green spaces of Athens with plant material and is using potable water from Athens's Water Supply and Sewerage Company (EYDAP) for its irrigation. The City of Athens is seeking alternative water sources leveraging circular economy solutions to achieve environmental, social and financial benefits for the city.

The Urban Tree Nursery of the City of Athens is part of the Goudi Park, an area in the process of redevelopment and regeneration to become one of the key Metropolitan Parks of the Capital. The area, which lies in the heart of Athens, is a mixed-use area, comprising of urban green and urban agriculture spaces as well as administration and residential uses. The regeneration is an effort to boost both the local economy and improve quality of life for the 4.000.000 citizens of the Attica Region.

RELEVANT DATA:

- Autonomous and modular water system: 25m³/d



Key Circular Economy Innovations

- Demonstration of a **sewer mining modular unit** for wastewater treatment with Membrane Bioreactor (MBR) and disinfection.
- Enabling **novel wastewater reuse options** at the point of demand for **urban green irrigation, urban agriculture** and **other non-potable uses** (fire protection, washing of municipality vehicles).
- Supported by **biomakery™ solutions** for **nutrient and energy recovery** for more complete autonomy.
- Evaluating innovative circular solutions for their ability to **address real world problems in water scarce cities**

Activities of EYDAP in the project

- EYDAP** will install and operate an innovative pilot wastewater recycling unit based on sewer mining, which will at the same time allow the recovery of energy and nutrients through engineered ecosystems in the Athens Urban Tree Nursery.
- EYDAP** will test the efficiency of the alternative water treatment technologies and assess their potential in creating a grid of decentralized units that offer the ability of distributed water reuse. Testing will be done through monitoring of the water quality and energy consumption. Another important factor that will be evaluated is the unit usability in terms of ease of use and maintenance/intervention frequency.
- EYDAP** will be actively involved in the scientific and administrative management of the project and will also be involved in the participation and organization of workshops and dissemination events.

Involved partners

NTUA,

BIOPOLUS,

CHEMITEC,

City of Athens,

EYDAP

