Case study factsheet

Lisbon, Portugal

Last update on 2024-05-09

Project B-WaterSmart

Lisboa, Portugal , **Portugal**

Description

The Lisbon Living Lab key smart-water challenges are: a growing resident population and economy, dependent on distant freshwater resources (up to 100 km), climate challenges (e.g., droughts and floods) and the need to increase urban green areas. Lisbon has a smart management strategy for all key areas of urban development. Lisbon's European Green Capital 2020 Award has catalysed political willingness and investments to improve the city's water-smartness. The city aims at providing a high quality of life for an increasing population and a growing economy, whilst tackling climate change challenges based on a green-blue problem-solving infrastructure. Actions include increasing green areas while decreasing the city's water-energy-phosphorus (W-E-P) footprint by improving the water supply & demand management, testing alternative sources (e.g., reclaimed water) and smart metering housing.

Lisbon LL ambitions are to deliver algorithms and software for a smart allocation of the water quality (fit-for-purpose) and quantity (water efficiency) in the city. Specifically, the ambition is to (i) improve the water supply / demand management and ultimately the city's water-energy-phosphorus (WEP) footprint while increasing the green areas, (ii) promote the safe use of alternative sources (e.g., reclaimed water), and (iii) promote climate-ready (water-energy efficient, climate-change proof) housing.

Making Lisbon a water-smarter city implies the involvement of different stakeholders in the provision and use of water. The following approaches were considered for the desired transformation into a water-smarter society

- To increase the citizens' awareness about the local context regarding the water use in the city via the provision of appellative information and to inform individual entities about their water consumption, in case of smart water metering (Tool #20)
- To support the decision-making process of water demand planners and managers in urban, municipal and water utility contexts, by delivering an overview of the current water supply and water demand in the city to enable prioritizing strategic and tactical planning options (Tools #17, #24, #25, and #27).
- To guide or assess the promotion of climate adaptation in housing via a certification process used by housing owners and planners (Tool #33).

Key lessons

A selection of key lessons

Pros:

- Since the goal is to optimise the use of water in the city for non-potable uses, the decision-making process should be demand driven, i.e., with a fit-for-purpose quality to satisfy an efficient water use.
- Decision-making tools must provide structured, user-friendly methodologies for human health and environmental risk assessment, making expert-knowledge available for risk managers and stakeholders responsible for non-potable water uses in the city.
- There is interest in the housing market in providing information on environmental aspects of buildings.

Challenges:

- Compiling information about water demand for non-potable uses in the city and available water sources can be difficult. Applying tools that function as data repository catalyses a proper data management.
- The results naturally depend on the quantity and quality of the information available for the calibration and use of the hydraulic and water quality models. The effort required to obtain this information is largely compensated by the benefits that the control of the disinfection process of reclaimed water has on the risk management associated to water reuse, as well as on the investment and operational cost of the reuse system.
- Exploiting the full potential of a smart-water allocation in Lisbon requires the existence of a public reclaimed water distribution network (nowadays available only in some areas), with sound asset management.

Legislation and policy recommendations

- National (Portuguese) legislation: Decree-Law 119/2019 on water reuse.
- European regulations: Reg. (EU) 741/2020 on minimum requirements for water reuse in agricultural irrigation and Urban Wastewater Treatment Directive (recast) (new proposal under approval).

Applied technologies

- **Activated carbon treatment coupled to an AOP**
- **Reverse Osmosis**
- **UV/Ozone**

Applied products

Water-energy-phosphorous balance planning module

https://mp.watereurope.eu/d/Product/55

Urban Water Cycle Observatory

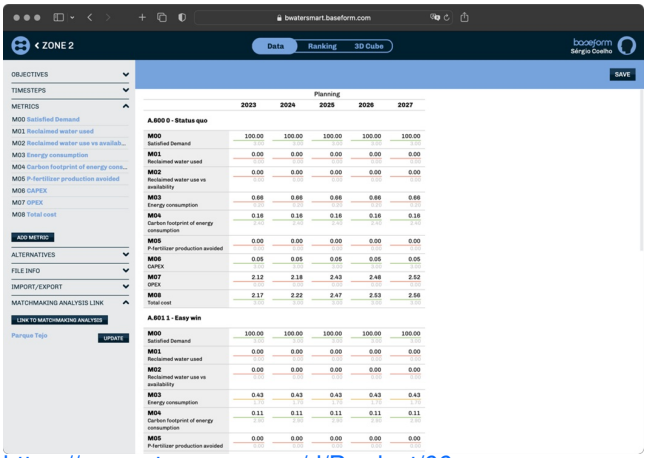
observatórios LISBOA

https://mp.watereurope.eu/d/Product/34

Climate Ready Certificates

https://mp.watereurope.eu/d/Product/31

Environment for decision support and alternative course selection



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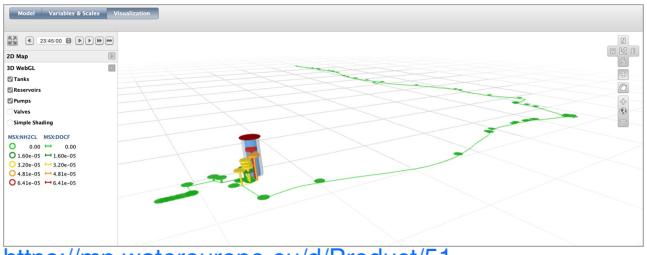
Reclaimed water distribution network water quality model



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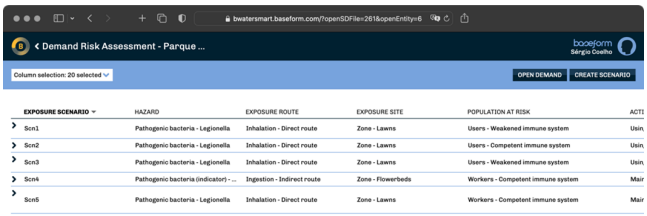
Risk Assessment for urban water reuse module



https://mp.watereurope.eu/d/Product/67

Publications and references

- Costa, J., Mesquita, E., Ferreira, F., Rosa, M. J., and Viegas, R. M. (2021). Identification and modelling of chlorine decay mechanisms in reclaimed water containing ammonia. Sustainability, 13(24), 13548.
- Ribeiro, R., Rosa, M.J. (2022). Avaliação do risco para a saúde humana associado à reutilização de água: construção de cenários de exposição. 20.º ENASB, Cascais, 24-26 November 2022, 5 p. (communication in a conference)

Scales

Operational scales of this case study related to the application of tools and technologyies

- Local scale
- City scale
- Regional scale
- Other

Challenges

Challenges that are addressed through the application of tools and/or technologies to the case study

- Water Scarcity
- High drinking water demand due to dense or growing resident population and economy
- Untapped efficiency potential of water resources
- Dependent on distant freshwater resources
- Need for reuse and recovery schemes for wastewater & sludge

Related tags

water Reuse Demand multicriteria

Contact data

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Involved organisations

1. 

Agência Nacional de Energia (ADENE)

2. 

Águas do Tejo Atlântico, S.A. (AdTA)

3. 

Câmara Municipal de Lisboa (CML)

4. 

Instituto de Ciências Sociais da Universidade de Lisboa (ICS)

5. 

Laboratório Nacional de Engenharia Civil E.P. (LNEC)

6. 

Lisboa E-Nova

URL

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