Case study factsheet

Nafplio, Greece

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Project ULTIMATE

Peloponnese , **Greece**

Nafplio, Greece

Published in the Water Europe Marketplace

Description

The eastern Peloponnese is one of the most important citrus fruit producing areas in Greece, while other fruits are commonly cultivated, such as stone fruits, berries, grapes and so on. This has given rise to the flourishing industry of juice manufacturing in the area, with a significant number industrial units of various sizes in the wider area. Intensive farming and increasing industrial activity exert great pressure in the aquifer with farmers and industrial units alike, are competing for ground water. Hence Water recycling has become imperative tackle the competition for water and the diminishing quality of the aquifer. Greener than Green Technologies has developed a methodology for the remediation of wastewater rendering it suitable for reuse, but also provides the ability to extract compounds of interest, or value-added compounds (VAC), form wastewater for further purification and commercial commercialisation. A prototype has been developed and installed in the facilities of Alberta, a juice manufacturer, near Nafplion, in the eastern Peloponnese. The prototype incorporates number of established and novel technologies. At first VACs are extracted by adsorption on suitable material, scubas polymeric resins. Suspended solids are then precipitated before further treatment by Advanced Oxidation process (AOP), where organic matter is decomposed by photocatalytic oxidation. This can lead to either complete mineralisation i.e. decomposition to CO2 or simply to either smaller molecular entities that are easier be decomposed by the next step. The resulting is then subjected to biological treatment using a Small Bioreactor Platform (SBP) where bacteria encapsulated in a capsule made of a porous membrane decompose the remaining organic matter rendering the wastewater suitable for reuse; irrigation of nearby orchards, reuse within the facility for secondary uses such as cleaning or simply dispose of it in the local or municipal biological wastewater treatment plant as less organic burden as possible. In parallel to ULTIMATE, Greener than Green Technologies is developing an AI and machine learning enchanted Decision Support Software (DSS). This will not only control the unit, but will also process signals from built-in and external sensors, as well as gather historic and other external data such as weather forecast, in order to determine the most suitable way to reused the reclaimed water. The DSS prompting the user with simplified information, and decision choice, reduced the need of highly skilled personnel for supervising or running the unit. The business model upon which this technology will be made available to the market also offers and innovative aspects, aligned with the principles of circular economy. The unit has been designed to be mobile and quickly deployable. Units will be offered as a “Product-as-a-Service” (PaaS), rather than sold, only for the desired time slot, to cover the seasonal needs of customers.

Applied technologies

- **Adsorption systems**
- **Advanced oxidation processes (AOP)**
- **Nutrients/Material recovery technologies**

Publications and references

- Naves Arnaldos, A., van den Broeke, J., Guleria, T., Bruni, C., Fantone, F., Touloupi, M., Iossifidis, D., Giménez Lorang, A., Sabbah, I., Farah, K., Baransi-Karkaby, K., Pidou, M., Reguer, A., Kleyböcker, A., Jährig, J., Vredenbregt, L., Thisgaard, P., D1.9 Start-up and intermediate results of plant operation from all case studies, Project report, *ULTIMATE,* 2023

- Yeara Bar Oza,b , Hadas Mamaneb , Ofir Menashec , Vered Cohen-Yanivb , Rupak Kumard , Lilach Iasur Kruhe , Eyal Kurzbaum, Treatment of olive mill wastewater using ozonation followed by an encapsulated acclimated biomass, Scientific paper / Journal, 2018

Scale

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

- Local scale

Challenges

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

- Water Scarcity
- Other

Related tags

adsorption | Advanced Oxidation Processes | Nutrient recovery | water remediation

Contact data

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Involved organisation

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URL

https://ultimatewater.eu/demo-site/mobile-wastewater-treatment-unit/