



## Case study factsheet

# Kalundborg, Denmark

Last update on 2023-07-14

**ULTIMATE** Project ULTIMATE

Kalundborg , Denmark



## Description

The Kalundborg Industrial Symbiosis Association exists since 1972 and interlinks thirteen private and public companies. The local industrial sector includes petrochemical, light building construction material, food, pharma, biotech, energy and bioenergy as well as waste processing.

Different circular economy approaches for water, energy and materials are already implemented, e.g. the reuse of cooling water for steam production, the reuse of gypsum from exhaust gas cleaning to produce plasterboards, integrated heat management and the transfer between the industries and the district heating network as well as heat recovery from process water for district heating. Even though, the Kalundborg Industrial Symbiosis already recovers and reuses certain materials, water and energy, there are still options to intensify and extend the circular economy related strategies. One aspect is the treatment of wastewaters which is done by two companies Novozymes and Kalundborg Utility.

Ultimate focuses on the optimisation of two WWTPs aiming at developing and implementing a joint control system for both plants, the recovery of the WWTP effluent as fit-for-purpose water and to explore the potential for the recovery of valuable compounds from the industrial wastewater as well as on identifying options to reuse thermal energy recovered from wastewater. Therefore, the symbiotic relationship between Novozymes and Kalundborg Forsyning is extended in the frame of Ultimate to create a win-win situation for both.

## Applied technologies

- [Joint control system for two wastewater treatment plants](#)
- [Ultrafiltration & nanofiltration membranes as pre-treatment for reverse osmosis](#)

## Applied products

### ULTIMATE QMRA tool



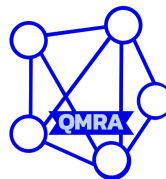
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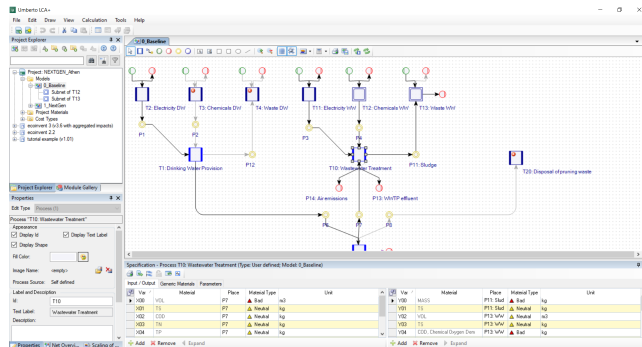
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### NEXTGEN + ULTIMATE Life Cycle Assessment



<https://mp.watereurope.eu/d/Product/24>

## 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., Vredenburg, L., Thisgaard, P., D1.9 Start-up and intermediate results of plant operation from all case studies, Project report, *ULTIMATE*, 2023

## Scales

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

- Local scale
- City scale

## Challenge

Challenge that is addressed through the application of tools and/or technologies to the case study

- Other

## Related tags

wastewater

heat

industrial symbiosis

## Contact data

### Contact person

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### Involved organisations

1. Kalundborg Forsyning
2. Kompetenzzentrum Wasser Berlin GmbH
3. Novozymes
4. Pentair