26 February 2026

SUSTEPS Partners make progress on scientific publications

A core innovation of SUSTEPS is the use of wastewater as a valuable input stream for algae cultivation. University of Southern Denmark's (SDU) recent research directly supports this approach by enabling recovery of the important nutrients, such as phosphate and ammonium, and using membrane separation of hydrothermal liquefaction aqueous phases (HTL-AP) for water recovery thus valorizing bio-oil byproducts. The SUSTEPS project highlights SDU as a key scientific contributor to sustainable process engineering and promoter of sustainable technologies.

Together, these efforts aim to demonstrate how wastewater and downstream process streams can be treated, refined, and reused within the SUSTEPS circular production cycle rather than discarded. This systems-level integration concept strengthens sustainability, improves resource efficiency, and reduces environmental impact across the entire bio-based value chain.

Research contribution

Recently, in 2025–2026, SDU SUSTEPS partners published significant peer-reviewed articles advancing sustainable technologies in nutrient recovery, membrane filtration, and bio-oil production. We invite readers to explore these studies, connect with the authors, and share any feedback related to this research:

- ***Phosphate recovery by struvite production from synthetic wastewater using a highly scalable 3D printed filter-press electrochemical flow cell.*** This study presents a scalable electrochemical system designed to recover phosphate from wastewater in the form of struvite, contributing to circular nutrient management and reducing reliance on finite phosphorus resources. ***Journal of Environmental Chemical Engineering***

- ***Nanofiltration of synthetic HTL-AP: rejection, fouling analysis, and membrane autopsy.*** The publication explores advanced nanofiltration techniques applied to hydrothermal liquefaction aqueous phase (HTL-AP), providing critical insight into membrane performance and fouling behaviour.
  Journal of membrane science

- ***Towards sustainable bio-oil production: Recycling and separation techniques applied to the aqueous phase byproduct of algae biomass hydrothermal liquefaction.*** This review critically discusses recycling and separation strategies that enhance HTL bio-oil production efficiency while minimizing waste streams from algae biomass processing.
  Separation and Purification Technology

Funded by the European Union

SUSTEPS is funded by the European Union under the Horizon Europe Programme, Grant Agreement No. 101122363. Views and opinions expressed are however those of the author(s) only and do not necessarily reflect those of the European Union or the European Climate, Infrastructure and Environment Executive Agency (CINEA). Neither the European Union nor the granting authority can be held responsible for them.