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MICROALGAE FOR WASTEWATER TREATMENT

#wastewater treatment processes #industrial waste treatment #innovative bioprocesses

GLS is an engineering company specialised in water treatment and, as such, frequently designs wastewater treatment plants. In that context, it must comply with the legal limits of nitrogen and phosphorous content in the treated wastewater discharged from the plant. As part of an innovation initiative, they turned to the researchers at the GEPEA laboratory, who are specialised in microalgae cultivation, as well as the renowned bioprocess engineers at Capacités. Their mission: verify the potential of microalgae for purifying wastewater and producing biomass, while ensuring a robust and economical cultivation process.

COUPLING WATER PURIFICATION WITH **BIOMASS PRODUCTION**

Microalgae are able to assimilate the nitrogen and phosphorous pollution in wastewater. It is with this in mind that GLS, an engineering company specialising in water treatment, wished to commit to an innovation strategy making use of microalgae. To achieve this goal, they chose to rely on the expertise of the microalgal cultivation and valorisation specialists at the GEPEA laboratory, as well as on the top-notch bioprocess engineers at Capacités.After having completed a preliminary characterisation of the reclaimed wastewater, Capacités's experts confirmed the technical requirements for cultivating algae in a laboratory environment. They were then able to transfer this cultivation process to raceway ponds (with water circulation) at the AlgoSolis R&D platform. The raceways, which are installed outdoor and received real wastewater from a local plant, ran continuously for 6 months in order to be able to account for the effects of seasonal changes at pilot scale.The experiment was thus able to demonstrate an effective reduction of nitrogen and phosphorous via this open cultivation system. It also revealed the relevant parameters and their impacts on the process. Upon completion of their research, Capacités's specialists were able to deliver a viable techno-economic model, taking the respective constraints of wastewater treatment plants, algal cultures and biomass valorisation into consideration.

To successfully complete this project, the Capacités'experts benefited from support and technical equipment from the GEPEA, joint research unit of the Université de Nantes, Oniris, IMT Atlantique and CNRS (The French National Centre for Scientific Research). ■

Expertises:

- Microalgae
- Bioprocess engineering

CAPACITÉS

Created in 2005, Capacités is the private engineering and research valorisation subsidiary of the University of Nantes. It employs 90 employees, mainly engineers and PhDs, who work directly with scientists in the research laboratories.

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