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Nutrient recycling in large-scale microalgal production: mass and energy analysis of two recovery strategies by process simulation

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Highlights

- Nutrients recycling based on Flash Hydrolysis and Anaerobic Digestion was simulated
- FH is more efficient in nutrient recovery and allows faster mixotrophic algal growth
- Low biodegradability and P precipitation are the main inefficiencies of AD
- AD appears more favorable in terms of energy profitability (EROEI)
- FH needs to be technologically optimized to reduce the heat energy requirement

Abstract

Nutrient recycling is of paramount importance for microalgal cultivation aimed at biofuels production. Though different techniques have been assessed at lab-scale level, less information is available on the actual nutrient recovery yields and on the energy balance of a large-scale closed-loop process. In this work two technologies,

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