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Circular Resource Flows from Algae Production

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ABSTRACT

Algal biomass has been identified as a promising substrate for energy production. Several lab scale experiments have been performed on different species of both macroalgae and microalgae. The high content of carbohydrates makes both macroalgae and microalgae appealing feedstock for bioethanol and biogas production. Unfortunately, so far no industrial scale plant has been set up. This is a demonstration that there are still constraints to be overcome. This study will tackle the first obstacle for the development of this technology: the feedstock supply to a potential biorefinery. This study evaluates difficulties and constraints in the macroalgae and microalgae growth process though the utilization of the Life Cycle Assessment and an economic evaluation. In particular a case study of *Saccharina latissima* cultivation site in Limfjorden (Denmark) and a microalgae cultivation site in Finland will be compared and presented. Minimum feedstock requirement for a biorefinery, minimum selling price and influence of transport of the raw material, provide useful information for system design.