



The Potential of Using Algae as Feedstock for Biofuel, A Nordic Perspective

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ABSTRACT

At first glance, areas in the high latitudes, like the Nordic Region, seem suboptimal for large-scale outdoors phytoplankton cultivation. It is obvious that dark winter season is not suitable for growing any photosynthetic organism. However, beyond winter months, the supply of solar energy is sufficient for phytoplankton growth. In this presentation, theoretical and realised phytoplankton productivities at various latitudes are compared. Temperature is considered another limiting factor for phytoplankton growth at high latitudes. Some phytoplankton species are, however, adapted to temperatures close to the freezing point. We show that they may have high growth rates and accumulate large amount of lipids, thus being potential candidates for biofuel production.

Fertilizers and CO₂ is a major cost when growing phytoplankton at large scale. Using waste streams as nutrient source for cultivation may thus reduce both the production cost, and also provide additional societal services by reducing nutrient fluxes to the sea. We present estimates for how much phytoplankton biomass may be produced using municipal waste waters. As a conclusion of this analysis, nutrient recycling becomes crucial for large-scale, cost-efficient production of phytoplankton biomass.