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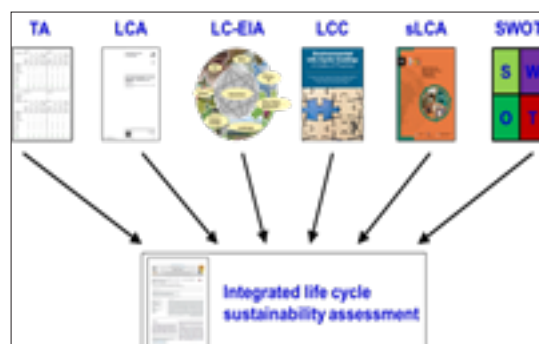
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Algae based biofuels: Boon or bane?

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Algae cultivation has raised high hopes for a sustainable production of various bio-based products from seemingly abundant sunlight and CO₂. A new generation of industrial scale algae facilities seeking to realise these potentials may come within reach soon due to enormous techno-logical advances. Currently, many approaches are concentrating on algae based biofuels. We have comprehensively analysed algae cultivation plants operational for decades and concrete plans for new algae biorefineries for their impacts on global and local environment, economy and society. They cover many different algae strains, all production technologies including several variants of raceways and photo bioreactors and whole value chains including harvesting, medium recycling, extraction, purification and utilities provision. To prove their sustainability, integrated life cycle sustainability assessments have been performed (ILCSA) based on technological assessment (TA), life cycle assessments (LCA), life cycle environmental assessment (LCEIA), life cycle costing (LCC), social life cycle assessment, and SWOT analysis on strengths, weaknesses, opportunities and threats.



Sustainability assessment:

Inputs for integrated sustainability assessment

From these examples, many lessons can be learned. Several measures to make algae production and use more sustainable will be highlighted. They include, next to many others:

- Site selection for algae cultivation is crucial
- Solar power can make a big difference. Basically, the more re-newable energy can be used, the better.
- CO₂ as an input with no or little impacts, e.g. from flue gas from a power plant, can improve the sustainability results significantly.
- Use of co-products can produce added value and enormously improve land use related environmental impacts

Facts, data and figures will be displayed to underline their importance. Detailed discussion and presentation of the findings are complemented by conclusions and recommendations for policy, industry, science and society.

Biography

Guido A Reinhardt is Member of the Scientific Board of IFEU and Scientific Director of the Department of Sustainability of Renewable Energies and Biobased Systems. Since he joined IFEU in 1991, he has been working in the fields of life cycle assessment (LCA) and integrated life cycle sustainability assessment (ILCSA), covering several sectors such as industrial products, transport and environment, environmental assessments of food, bioenergy, industrial crops and biobased materials, these includes all existing and innovative biofuels for transportation. He has a broad experience in the acquisition and coordination of large-scale projects and is a Consultant for national and international institutions such as the European Commission, FAO, UNFCCC, UNIDO, etc. He is a member of several advisory panels. He is author and co-author of many books and 400+ publications.

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