Key Characteristics: Multidisciplinary approach: Automotive, Chemistry and Biotechnology • Combining CO2absorber and fuel refinery in a single variable-size plants • Independent Energetic Economy in Europe • Oil&Lithium-freetransportation •

Biorefarmeries: Milking ethanol from algae for the mobility of tomorrow

The idea of this project is to fully exploit microalgae to the best of its potential, possibly proposing a sort of fourth generation fuel based on a continuous milking of macro- and microorganisms (as cows in a milk farm), which produce fuel by photosynthetic reactions.

To reach this goal, the ethanol production needs a new approach, mainly taking advantage of renewable resources and new sustainable production plants, to completely fulfil the growing demand for green fuels, overcoming soil over-exploitation issues.

As far as third generation fuels are concerned, biomass harvesting and fermentation could be not as closed a CO2-circle as it is claimed to be. The alternative fourth generation fuel solution comes from a new combined bioreactor, in which CO2 is used as part of the feed and ethanol is a product of selected micro-algae's metabolism that can be collected without killing the biomass, reducing harvesting and fermentation impacts.

This new system, in which microalgae are farmed in bioreactors for getting ethanol without killing but rather milking them, has been called biorefarmery (bio+farm+refinery), a neologism indicating a biorefinery in which an organism (e.g. microalgae) is "farmed" in order to let it grow and produce ethanol via photosynthesis ("Photanol process").

ALGHERO proposes a new transportation concept supported by a new socio-economic approach, in which biofuel production is based on biorefarmeries delivering fourth generation fuels which also have decarbonization capabilities, potential negative CO2 emissions plus positive impacts on mobility, the automotive Industry, health and environment and the economy •