DESIGN OF MICROALGAE PHOTOBIOREACTORS IN MODULAR ALVEOLAR COEXTRUDED POLYCARBONATE PANELS AS VENTILATED FACADES IN THE ARCHITECTURAL SYSTEM

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Microalgae in Urban Agriculture

Photosynthesis

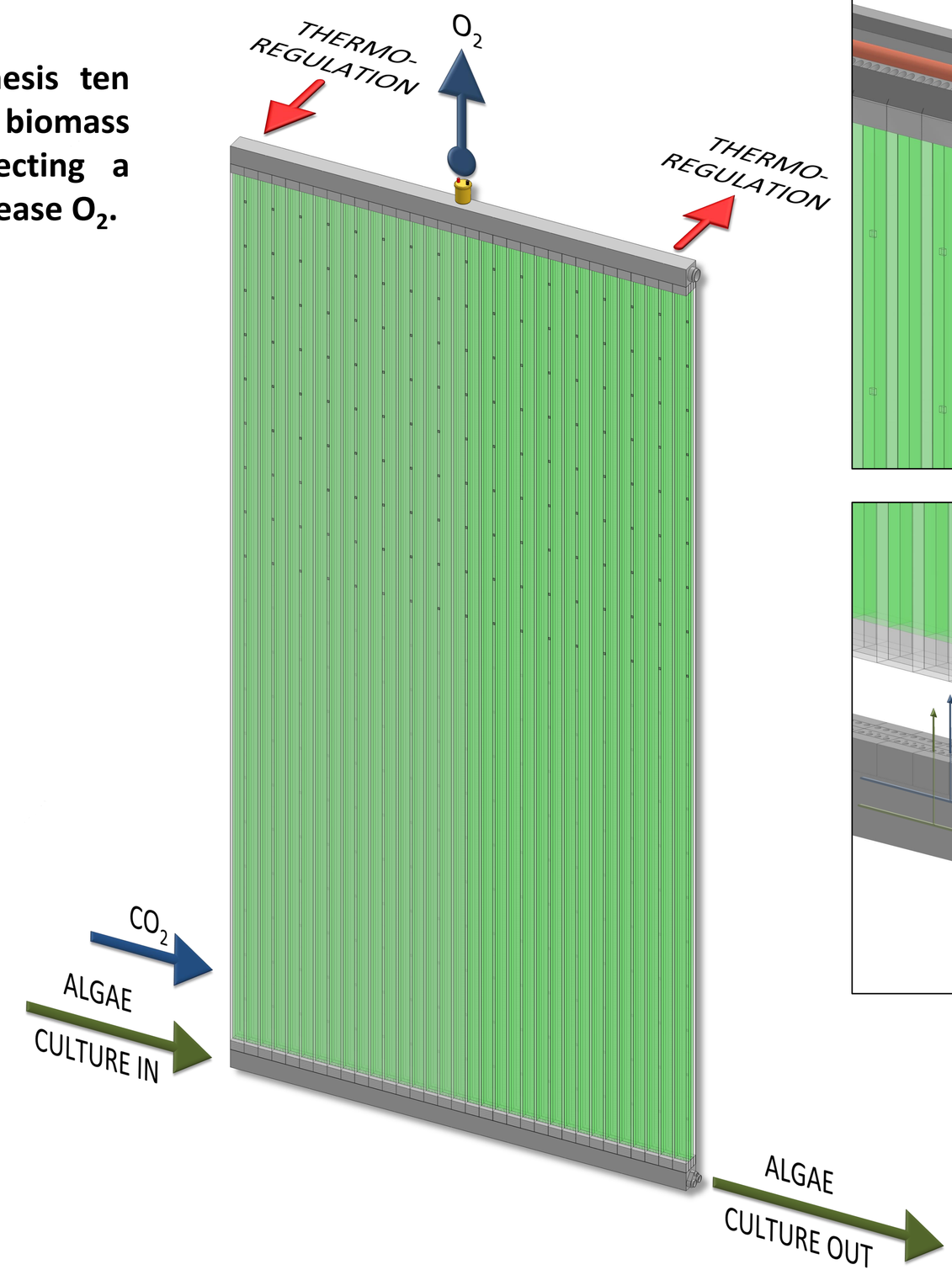
Microalgae can perform photosynthesis ten times more efficiently than other biomass feedstock as trees or grasses effecting a greater capacity to absorb CO_2 and release O_2.

Main constituents

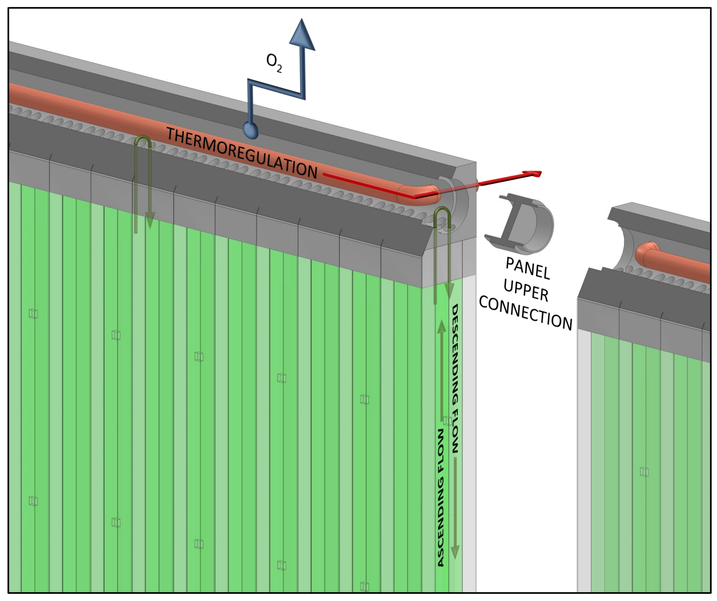
- carbohydrates
- lipids
- proteins

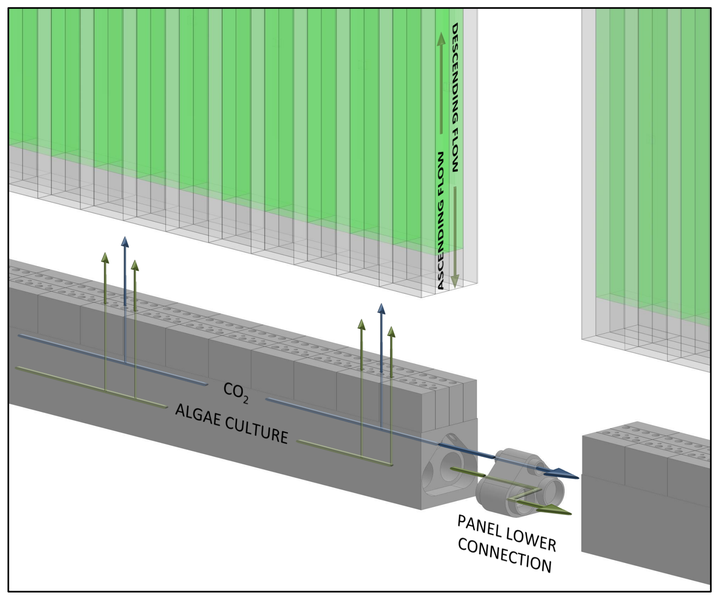
Utilisation

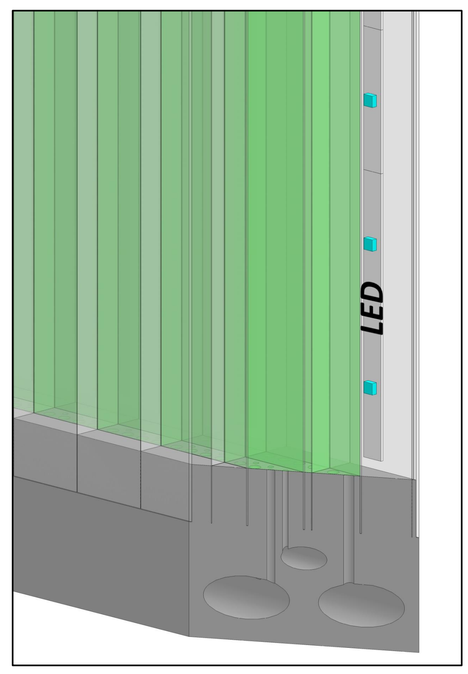
- health foods
- high value product:
  - functional food (nutraceuticals)
  - feed additive
  - aquaculture
  - DHA and β-Carotene
- biofuel:
  - carbohydrates (mainly C6)
  - lipids (mainly C16-C22)
- cosmetic
- pharmaceutical:
  - PUFA (polyunsatured fatty acids)
  - DHA (decosahexaenoic acid)



Photobioreactor Panel Design

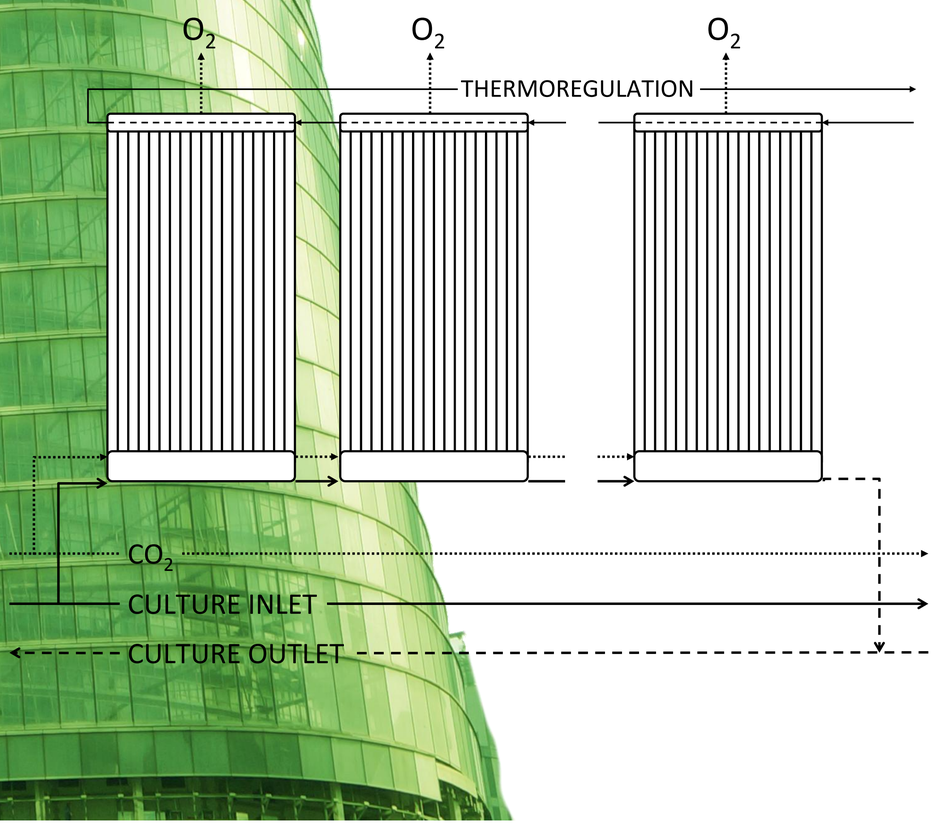




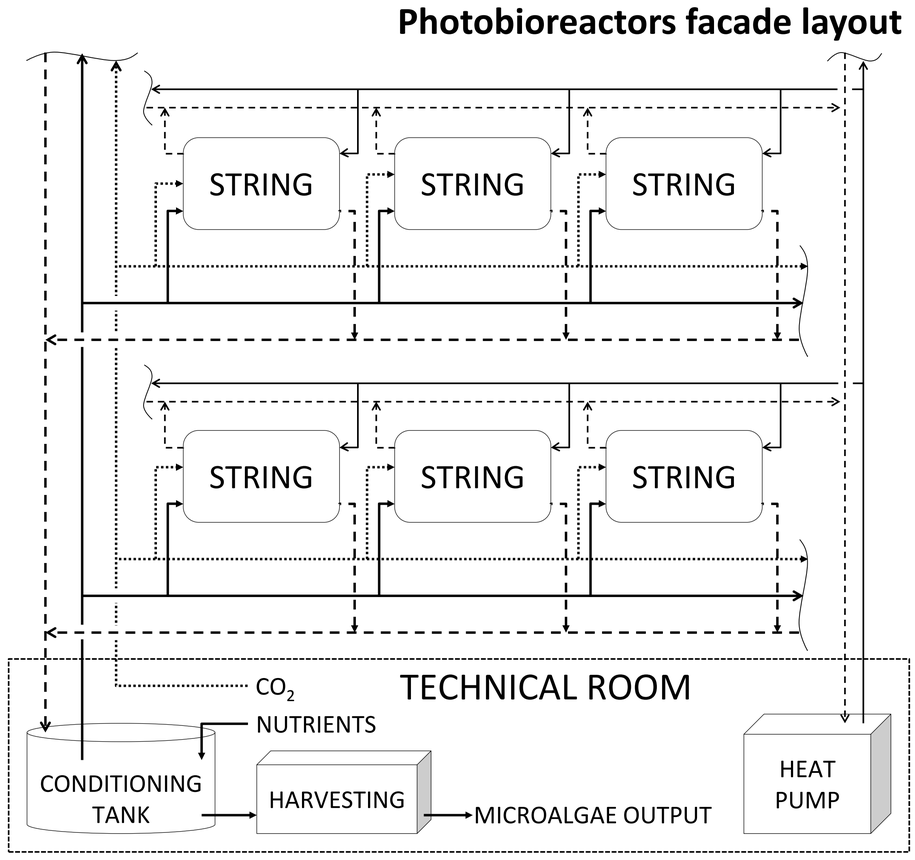


The design has been based on polycarbonate panels (modules) to give maximum flexibility for the architectural fitting in new or existing buildings. Modular alveolar panels in coextruded polycarbonate meet the attitude of modern building that implies the use of avant-garde materials; they enable designers to realize works from the most traditional to the most architecturally complex without any size limit. The use of polycarbonate makes the facades light and not expensive giving the opportunity of an innovative and suitable energy and food production system within our cities.

STRING series connection layout



Photobioreactors facade layout



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