



Overview of CO₂ capture in the cement industry using microalgae and their subsequent uses

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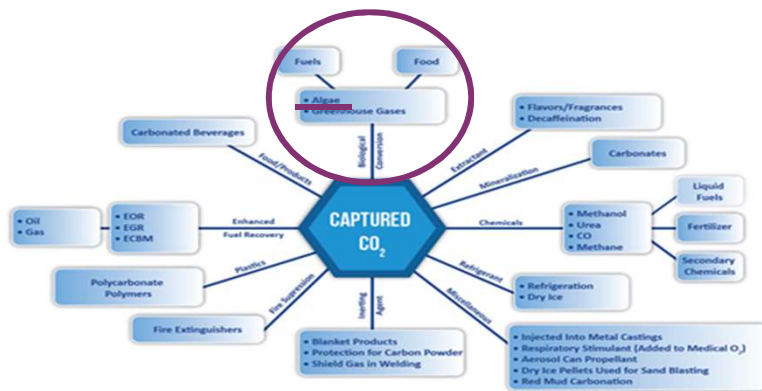
ESPP webinar on regulatory questions for nutrient recycling from waste-derived algae
22 March 2021



Global CO₂ emissions and Trends

Global energy-related CO₂ emissions

- 33,2 Gt of CO₂ emissions in 2019, 6-9% coming from the cement industry

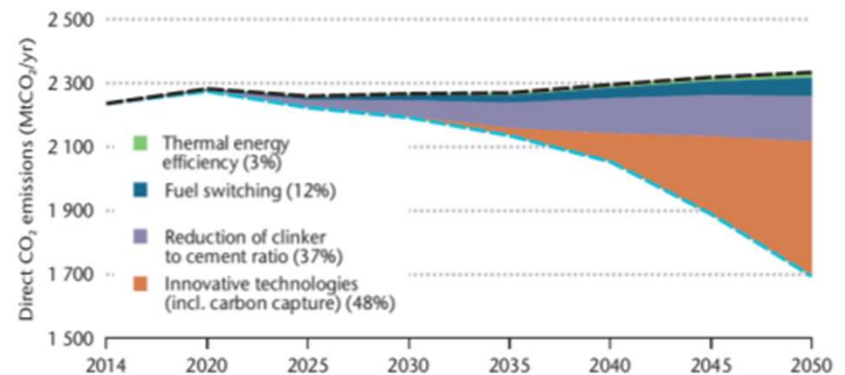


- Biological conversion of CO₂ (micro-algae) is now part of the portfolio for the cement industry (GCCA*, ECRA**)

*gccassociation.org/sustainability-innovation/health-safety-cement-innovation/carbon-capture-and-utilisation/ **H. Hoppe, european cement research academy 2020

65% of CO₂ emissions for the cement industry are geogenic ones

- All CCUS will count 18-24% of the CO₂ reduction by 2060 in the cement industry sector



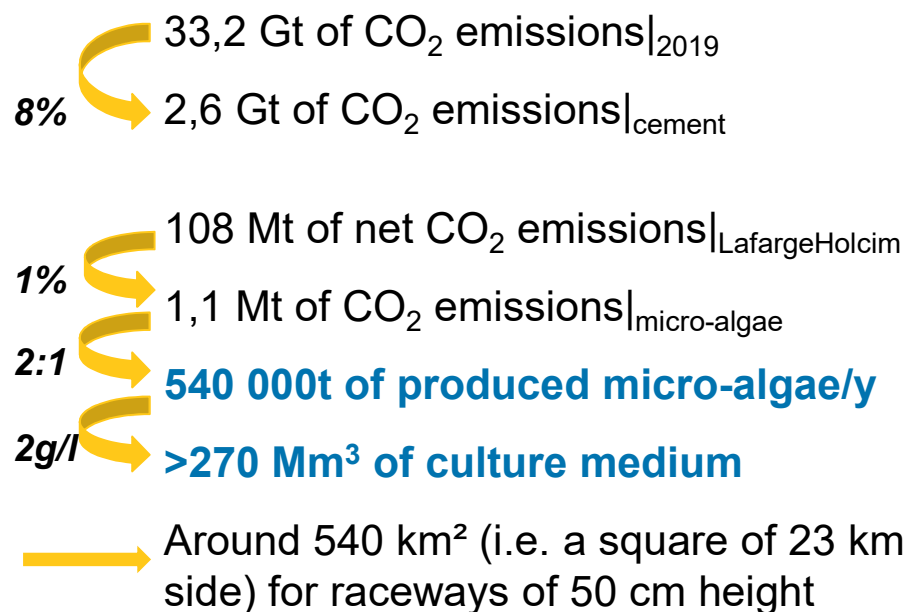
IEA (2019), *Transforming Industry through CCUS*, IEA, Paris
<https://www.iea.org/reports/transforming-industry-through-ccus>

Macro-figures dealing with micro-algae in cement industry

LH Net zero pledge



From CO₂ emissions to biomass



→ **Large volumes of CO₂ means large volumes of products like Bioenergy (fuels, gas, chars), Bioplastics, Biostimulants, Animal Feed, etc.**

Experience of LafargeHolcim with microalgae

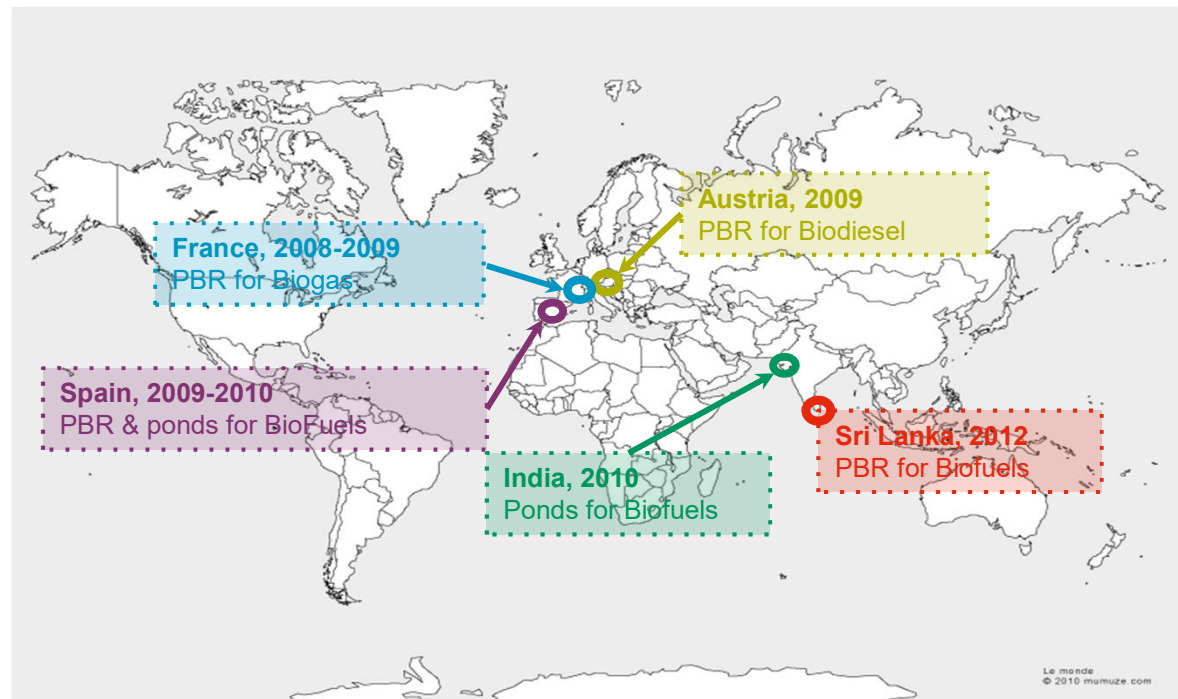
Investigations from 2006

Several culture technologies

- Ponds
- Tubular PBR
- Columns

Several seawater & marine micro-algae species

- *Chlorella vulgaris*
- *Chlorella emersonii*
- *Dunaliella tertiolecta*
- *Emiliana huxleyi*
- *Thalassiosira Weissflogii*
- *Isochrysis galbana*
- *Nannochloropsis oculata*
- *Scenedesmus sp.*





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