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UNIVERSITY OF LISBON
INTERDISCIPLINARY STUDIES
ON SUSTAINABLE ENVIRONMENT AND SEAS

# MICROALGAE BIOMASS AS A SUSTAINABLE FOOD SOURCE

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## SESSION IV - Industrial production of Microalgae biomass for different uses

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### SUMMARY

Microalgae production: From laboratory to industrial scale

Example of a sustainable intervention (Norway)

The relevant role of Portugal as microalgae producer

Different types of productions and facilities

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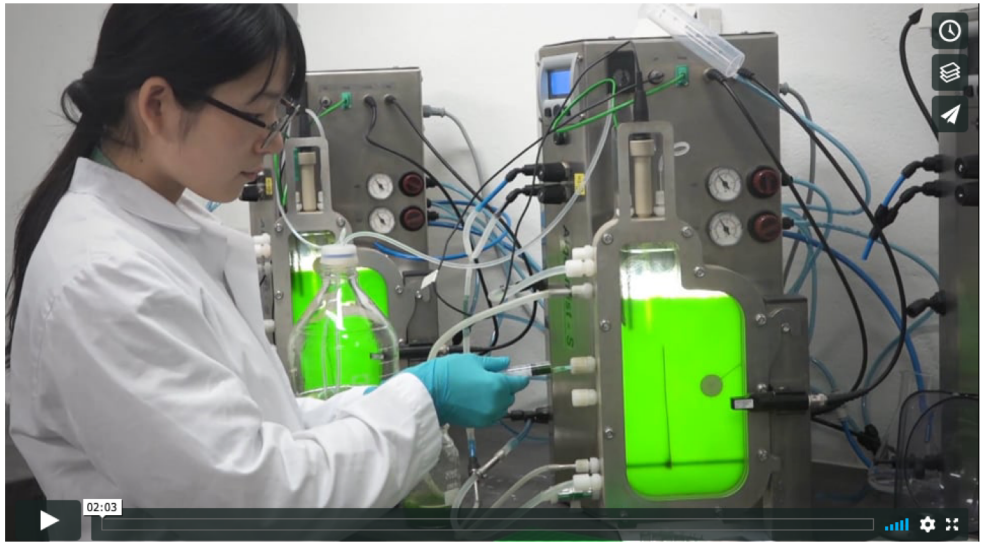
# MICROALGAE BIOMASS AS A SUSTAINABLE FOOD SOURCE

From laboratory to industrial scale ...

ALGAE TO FUTURE

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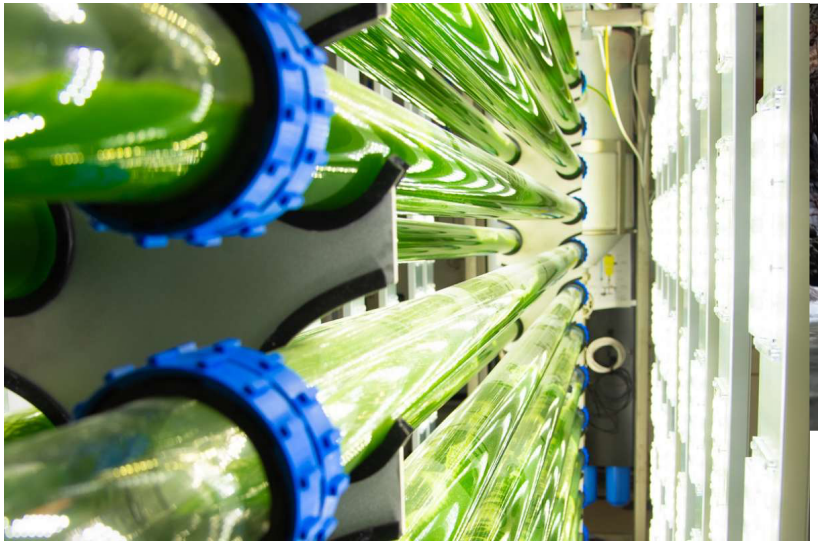
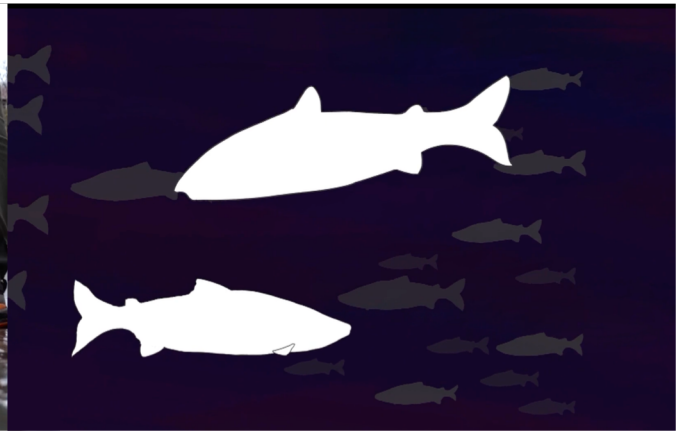
From laboratory to industrial scale ...

**Example of a sustainable intervention**

ALGAE TO FUTURE





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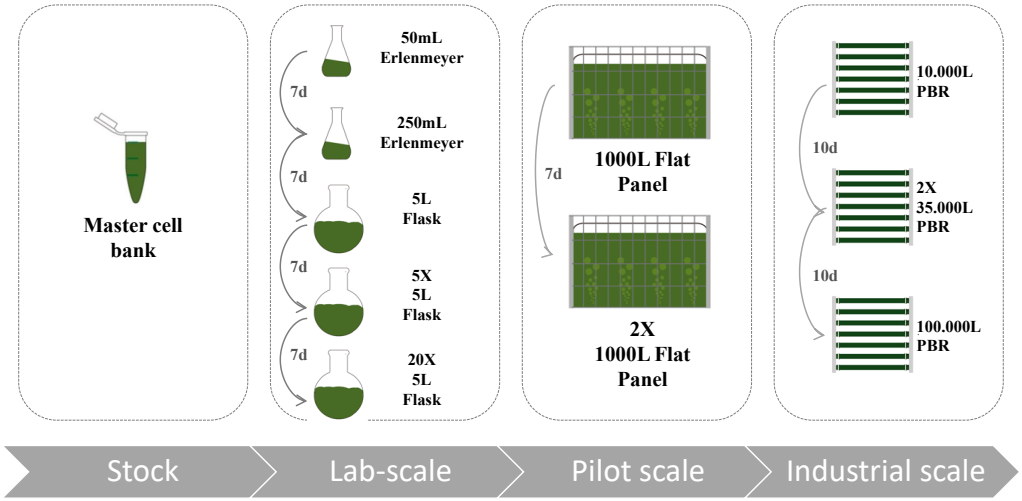
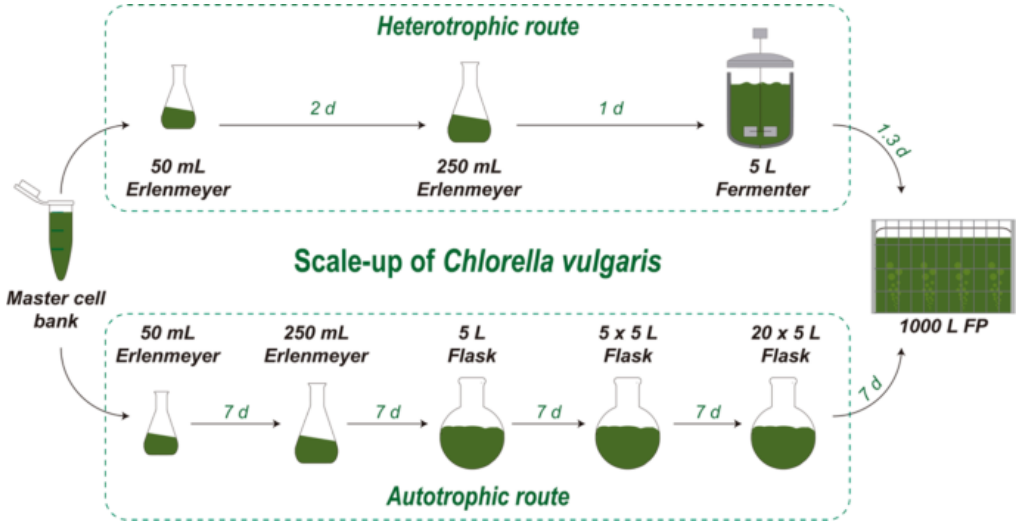
### Portugal is an important producer of microalgae worldwide!

Allmicroalgae
natural products

An innovative company that is born from the opportunity to take advantage of the $CO_2$ produced by a cement plant (SECIL) for the production of microalgae ...

## Microalgae cultivation




https://www.allmicroalgae.com/en/our-process/

Process-level innovation - fermentation to increase production yield.

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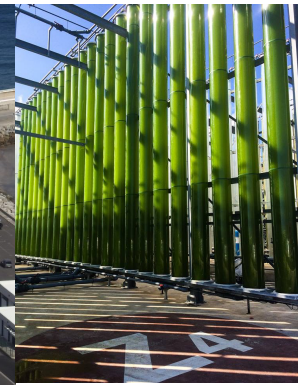
## Portugal is an important producer of microalgae worldwide!



http://www.buggypower.eu/pt/



BUGGY POWER

Production of microalgae on the island of Madeira, taking advantage of being close to the sea.

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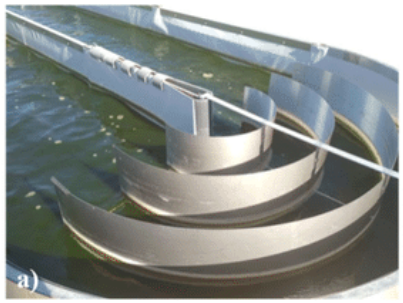
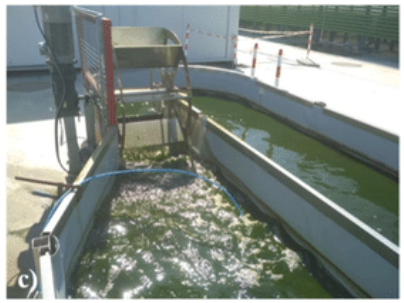
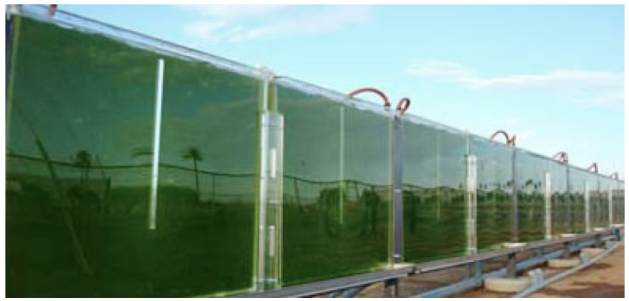
## Large scale production








Pilot raceways installed in Allmicroalgae facilities



Arizona Center for Algae Technology and Innovation

https://explorebiotech.com/everything-need-know-algal-biotechnology/

https://news.algaeworld.org/2017/11/can-we-maximize-the-economic-benefits-of-microalgae-biofuel-production/

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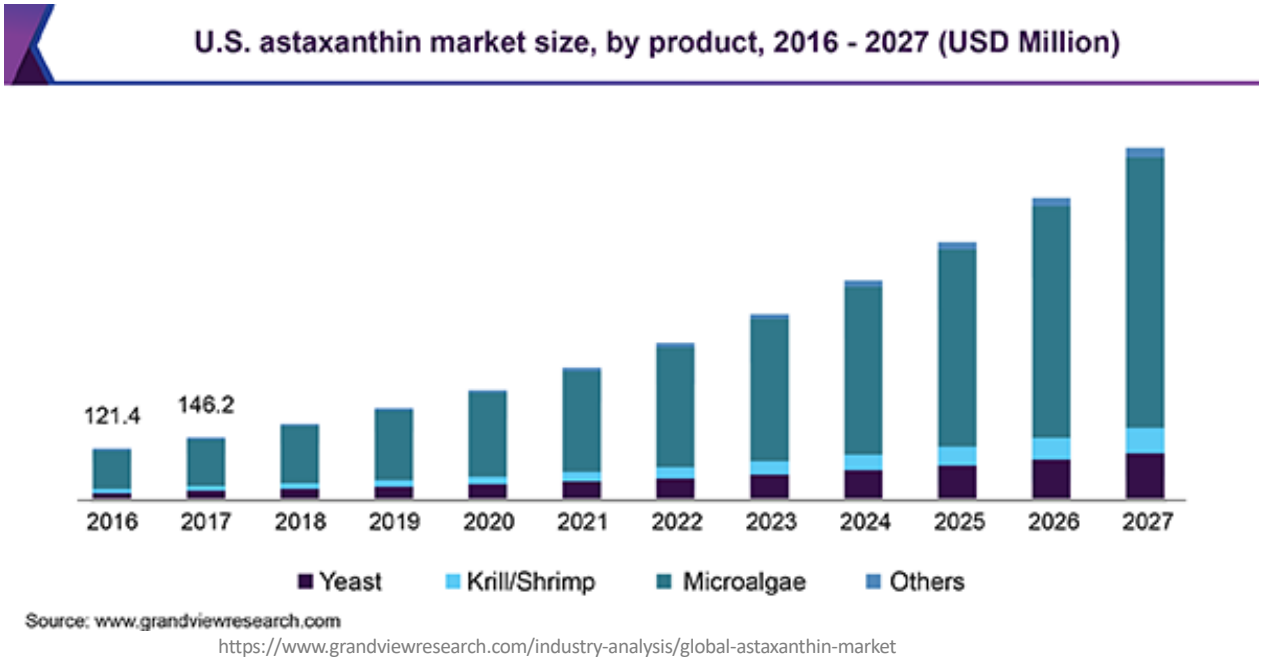
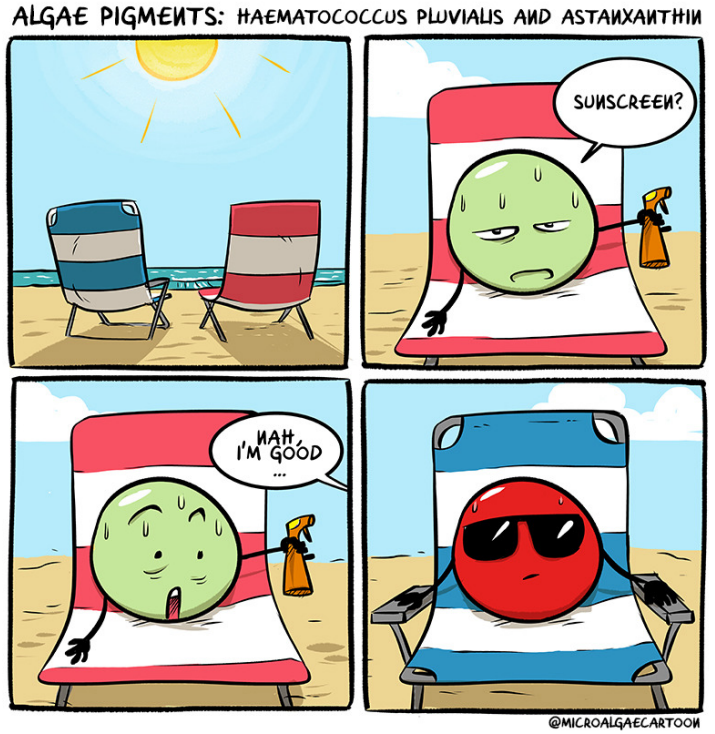



https://www.grandviewresearch.com/industry-analysis/global-astaxanthin-market




The production of microalgae has been associated with a market of high economic value, both for the use of whole biomass and for the extraction of value-added products.

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Different concepts for the future – our cities, our gardens...

https://www.dezeen.com/2017/09/10/ikea-space10-algae-producing-pavilion-copenhagen/

**Algae Dome**

Won an architecture competition.

Architects Aleksander Wadas, Rafal Wroblewski, Anna Stempniewicz worked with Space10's bioengineer-in-residence Keenan Pinto to design and build the dome:

***"It's inviting, yet enclosed form provides shelter and creates oasis for social interaction".***

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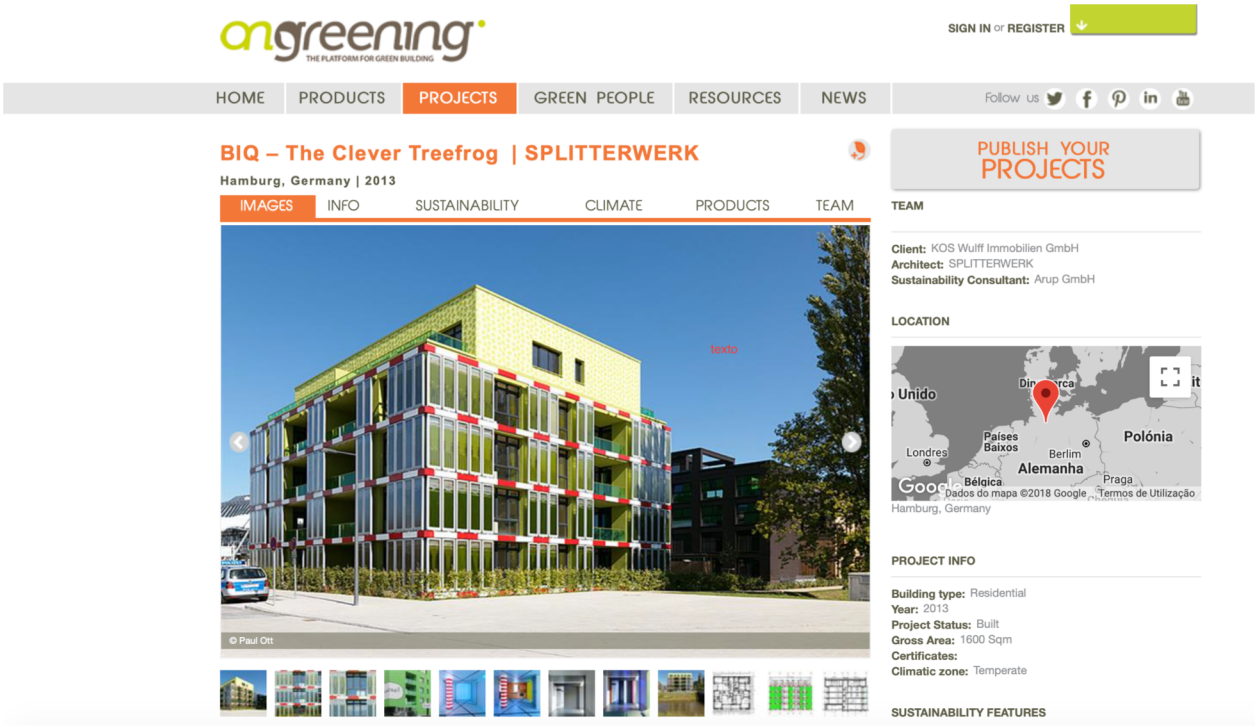


## Algae Architecture: Buildings That Produce Food and Fuel

**Algae architecture** is the cutting edge of urban architecture.


**Designing buildings so not only are they energy efficient but also able to make fuel, AND grow crops.**

They are already doing algae architecture in office buildings in Europe and Asia.

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# Massages to take home

Large-scale production of microalgae allows its widespread use in several areas.

There are interesting examples of microalgae production in full balance with nature.

There has been a very significant evolution in the means of production, expanding the use of fermentative processes to increase yield.


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