



VIO CHEMICALS

Microalgae: an excellent bioeconomy business case and ambitious investment in Greece

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**OUR
SCIENCE,
YOUR
PRODUCT**

Microalgae, the first natural food

Why do we need microalgae?

- They provide us with the oxygen we need to breathe.
- Every ton of algae consumes up to 1.8 tons of CO₂.
- They are renewable and sustainable.
- They are highly nutritious.



Global challenges

- Rapid population growth, urbanisation and overexploitation of natural resources
- Depleting fish population due to microplastic pollution & other ocean stressors
- Increased greenhouse gas (GHG) emissions from intensive animal farming and agriculture

“Microalgae can solve the food crisis”



To survive, we need to reinvent the way we farm and eat.



“By 2050, there will be a global need for 70% more protein to feed an extra 2.5 billion people” (UN/FAO)

With 7.2 billion people today, the planet is already struggling to meet humanity's demands for land, food and other natural resources, and to absorb its wastes.



“To confront global balances in the long term, the world needs to produce 50% more food to feed 9 billion people by 2050, but climate change could stop crop yield by over 25 %. Land, biodiversity, oceans, forests and other forms of natural capital are being depleted at unprecedented rates.”

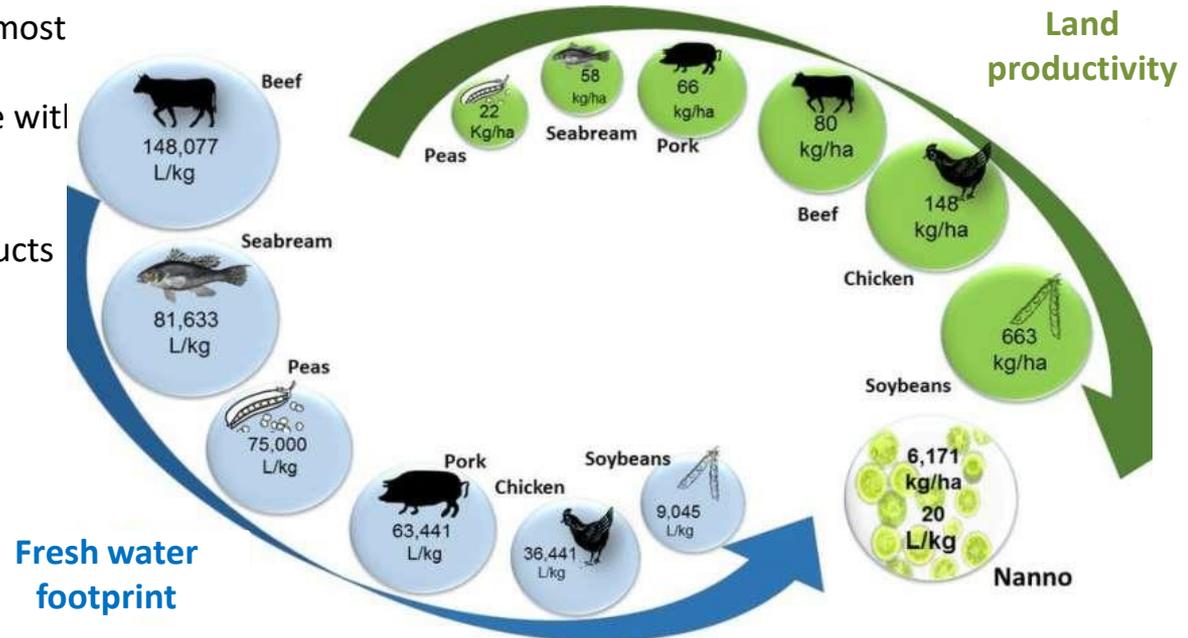
Microalgae enabling the bioeconomy



Key characteristics and enabling factors for the transition to a (blue) bioeconomy

- Autotrophic: they grow with sunlight and CO₂
- They consume CO₂ as opposed to intensive animal farming and agriculture, which are major contributors to GHG emissions
- Renewable: they grow faster than most productive crops
- Algae cultivation does not compete with agriculture
- Product outputs outperforming existing omega-3 and protein products from fossil alternatives (fish, meat, grain, milk sources)
- Minimised land and water use

"Untapped potential of lower trophic levels"



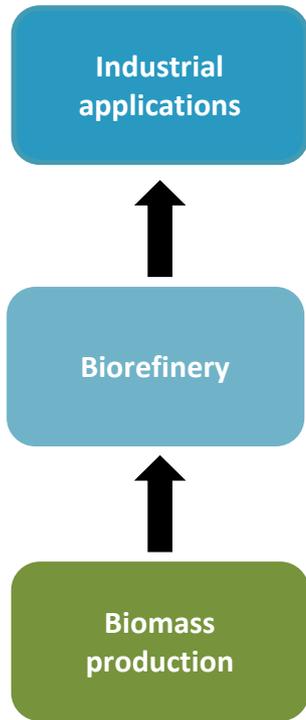
Credit: Industrial Biotechnology, CC BY-ND.

Source: <https://phys.org/news/2017-10-marine-algae-world.html#jCp>

An ambitious investment in Greece

We will install a large-scale production and biorefinery plant in Greece for the cultivation and commercial production of microalgae and microalgae-derived functional ingredients.

Main products: EPA-enriched omega-3 oil, zero-fat protein powder, EPA API



- **Initial investment of €8 million** to achieve yearly production capacity of 60 tons dry powder by 2024.
- **Additional investment of €10 million** for higher production capacity.
- **Net sales forecast from main products is estimated at €7.13 million** by 2024.
- **Ability to create 64 new, direct job opportunities** and at least 83 indirect jobs in the value chain, by 2024.



Our vision: To make Greece a European hub of microalgae production.

The role of VIO Chemicals

- **Nanno Algae Solutions: Foreign investment of 4 Swiss entrepreneurs**, one of them being Dr. Dimitris Kalias, CEO & founder of VIO Chemicals AG.
- Technological-innovation driven chemical SME, founded in Zurich in 2001. Offices in Switzerland, Greece, China and India. R&D Centre in Greece. Sales agents in Europe, Asia and the Americas.
- Core competencies lie in custom design, development and production of specialty chemicals, intermediates and active pharmaceutical ingredients.
- Strong experience and proven track record in chemical and pharmaceutical process development.
- Integrated support in QA, IP and RA for the seamless registration and commercialization of end products
- **VIO Chemicals has already invested over €1 million** in the development of non-destructive biorefinery technologies for the fractionation of microalgae cells, high-performance prototype products and pre-commercialisation activities, in its R&D centre in Thessaloniki, employing 30 highly-motivated scientists.



■ OS: 7 PhD, 6 MSc
■ AD: 3 PhD, 5 MSc, 1 BSc
■ QA/RA: 1 PhD, 2 MSc
■ IP/ScA: 2 PhD, 1 MSc
+ Management: 1 PhD / 1 MSc



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