

An aerial photograph of a river with white water rapids. The water is a vibrant green color, and the rapids are white and frothy. The text 'BUGGYPOWER' is overlaid in white, with a stylized leaf and drop icon integrated into the letter 'O'.

BUGGYPOWER

Microalgae life creators

**DESARROLLO DE PRODUCTOS DE ALTO VALOR
AÑADIDO UTILIZANDO MICROALGAS MARINAS**
*Development of high-added value products using
marine microalgae*

Manuel Tárraga – Director de Desarrollo de Proyectos
BUGGYPOWER SL, 5 de febrero de 2020

MICROALGAE AND THE FUTURE OF HUMANKIND



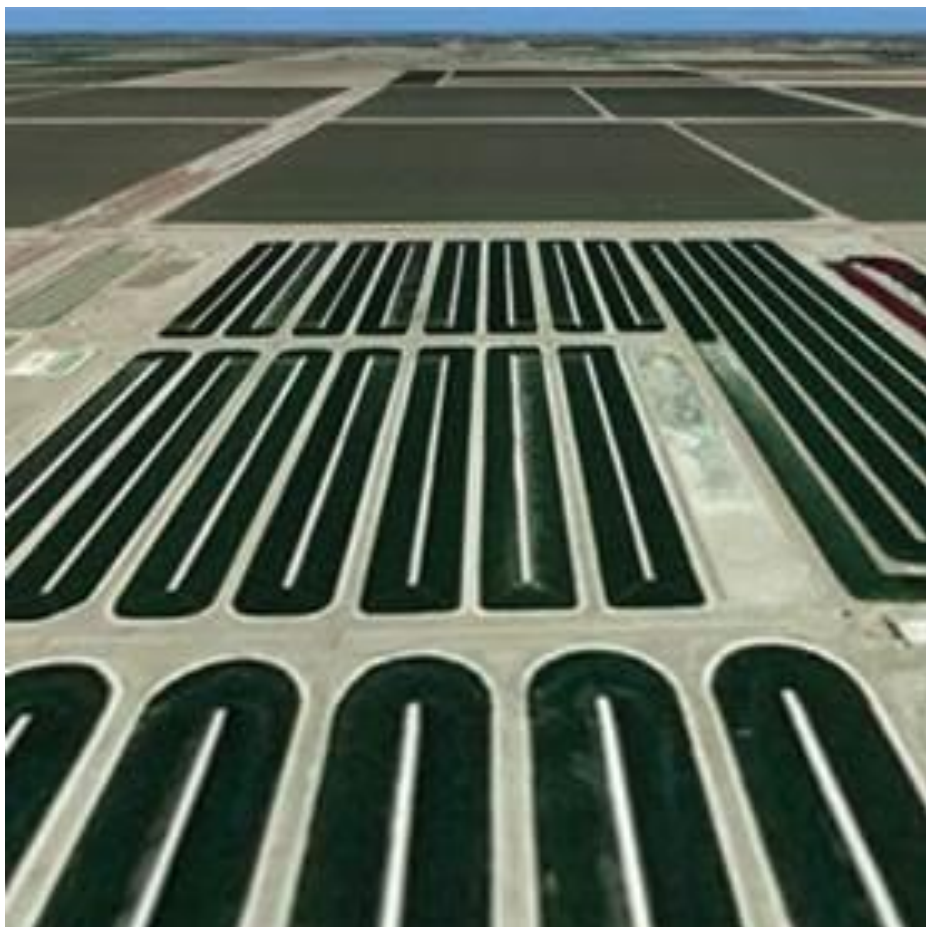
CURRENT STATE OF INDUSTRIAL MICROALGAE PRODUCTION ON A GLOBAL SCALE

HISTORY OF MICROALGAE PRODUCTION



HISTORY OF MICROALGAE PRODUCTION

OPEN SYSTEMS



CLOSED SYSTEMS

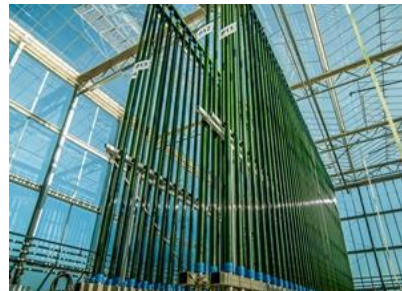


CURRENT STATE OF INDUSTRIAL MICROALGAE PRODUCTION ON A GLOBAL SCALE

GLOBAL MICROALGAE PRODUCTION

The current global production of microalgae is not sufficient in quantity or quality if we want to supply the potential world demand.

Micro-algue	Production annuelle	Pays producteurs	Application et produits	Prix
<i>Spirulina</i>	3 000 tonnes de matière sèche	Chine, Inde, USA, Birmanie, Japon	Nutrition humaine Nutrition animale Cosmétiques Phycobiliprotéines	36 €/kg 11 €/mg
<i>Chlorella</i>	2 000 tonnes de matière sèche	Taiwan, Allemagne, Japon	Nutrition humaine Cosmétiques Aquaculture	36 €/kg 50 €/L
<i>Dunaliella salina</i>	1 200 tonnes de matière sèche	Australie, Israël, USA, Japon	Nutrition humaine Cosmétiques B-carotène	215-2150 €/kg
<i>Aphanizomenon flos-aquae</i>	500 tonnes de matière sèche	USA	Nutrition humaine	
<i>Haematococcus pluvialis</i>	300 tonnes de matière sèche	USA, Inde, Israël	Aquaculture Astaxanthine	50 €/L 7150 €/kg
<i>Cryptocodinium cohnii</i>	240 tonnes d'huile de DHA	USA	Huile de DHA	43 €/kg
<i>Shizochytrium</i>	10 tonnes d'huile de DHA	USA	Huile de DHA	43 €/kg



CHALLENGES OF INDUSTRIAL MICROALGAE PRODUCTION ON A GLOBAL SCALE

PRODUCCIÓN MUNDIAL DE MICROALGAS⁽¹⁾

en 2016 **17.000** toneladas^(*)

en 2024 **28.000** toneladas^(*)

(*) materia seca

TAMAÑO DEL MERCADO⁽¹⁾

en 2016 **5.000 M€**

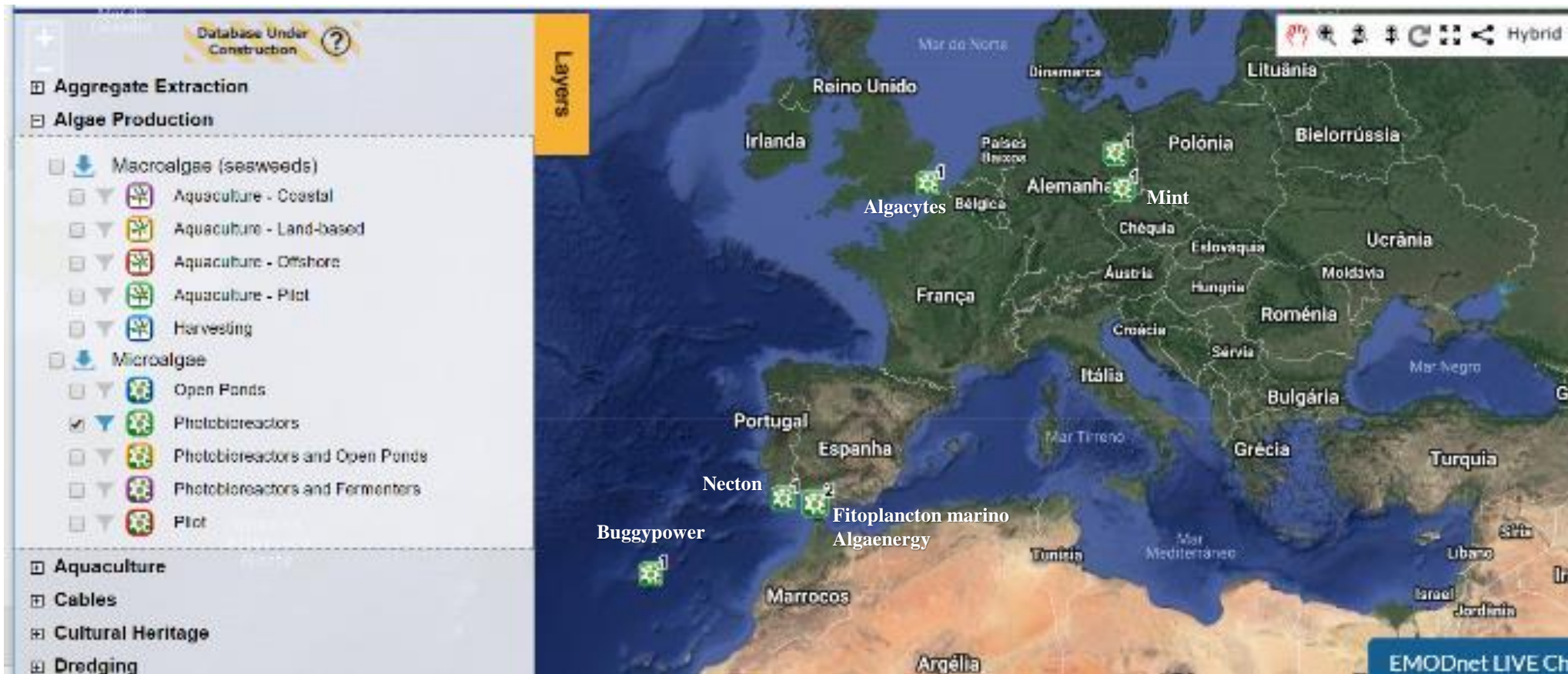
en 2024 **9.000 M€**



(1) Informe del *European Market Observatory for Fisheries and Aquaculture Products*, European Commission (2018)

CURRENT STATE OF INDUSTRIAL MICROALGAE PRODUCTION ON A GLOBAL SCALE

LARGE-SCALE INDUSTRIAL MICROALGAE PRODUCTION FACILITIES



The European Marine Observation and Data Network

LARGE-SCALE INDUSTRIAL MICROALGAE PRODUCTION FACILITIES

#1

Roquette Klötze GmbH, (2001) 1.2 HA *Chlorella*



LARGE-SCALE INDUSTRIAL MICROALGAE PRODUCTION FACILITIES

#2

Fitoplancton Marino, (2002) 1.5 HA *Nannochloropsis*



LARGE-SCALE INDUSTRIAL MICROALGAE PRODUCTION FACILITIES

#3

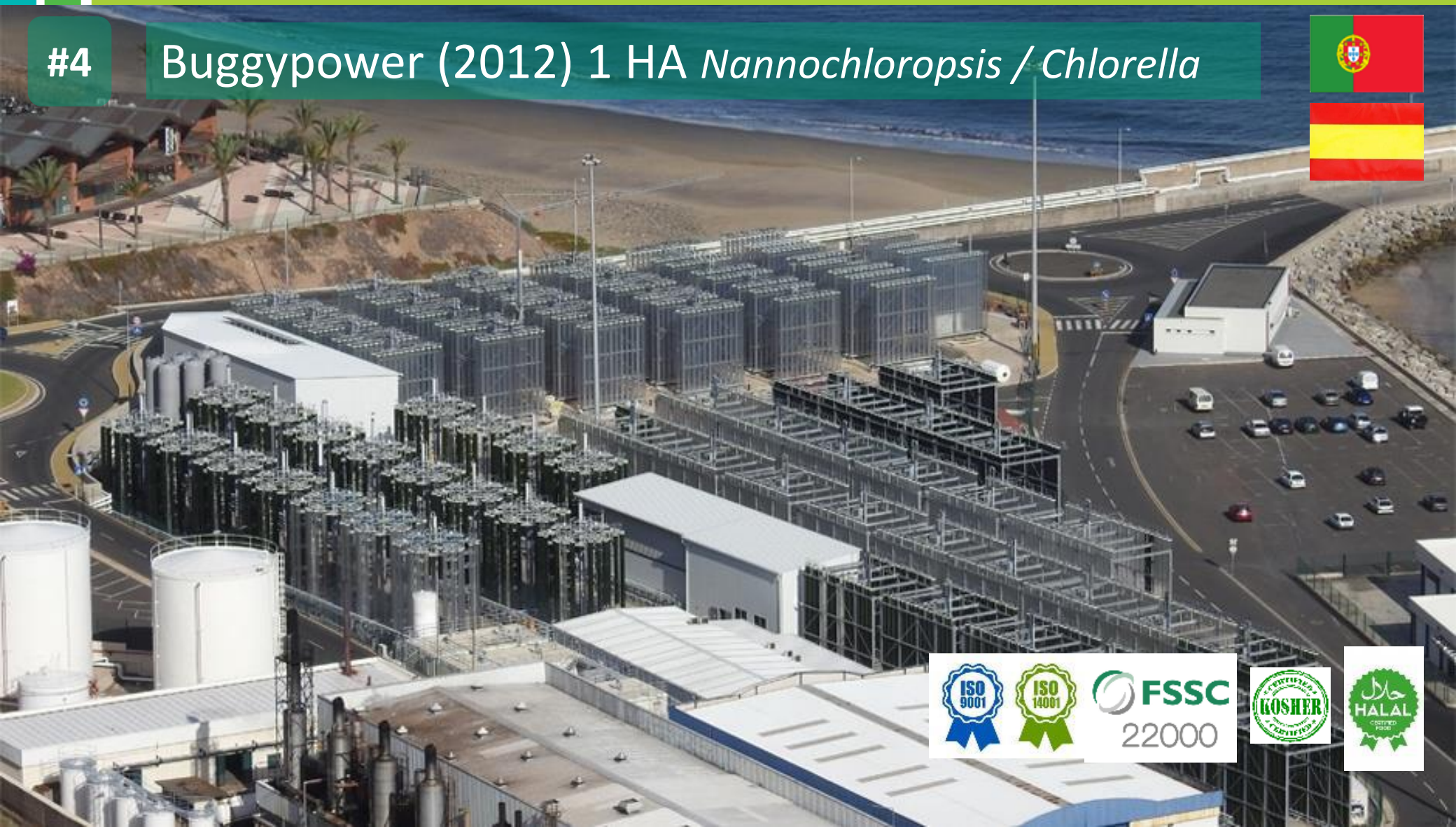
GinkoAsta Biotech Co., (2009) 12 HA *H. pluvialis*



LARGE-SCALE INDUSTRIAL MICROALGAE PRODUCTION FACILITIES

#4

Buggypower (2012) 1 HA *Nannochloropsis* / *Chlorella*



CURRENT STATE OF INDUSTRIAL MICROALGAE PRODUCTION ON A GLOBAL SCALE

THE BUGGYPOWER INDUSTRIAL PRODUCTION TECHNOLOGY



- ✓ 1.100 m³ de cultivo
- ✓ 2.870 FBR verticales - 8m de altura
- ✓ 60tn/año de capacidad de producción (biomasa seca, calidad premium)
- ✓ Tecnología de producción patentada
- ✓ En asociación con EEM – Empresa Eléctrica de Madeira



CURRENT STATE OF INDUSTRIAL MICROALGAE PRODUCTION ON A GLOBAL SCALE

THE BUGGYPOWER INDUSTRIAL PRODUCTION TECHNOLOGY



2011

- Project start: “Plant for capture and energetic valorization of CO₂.”



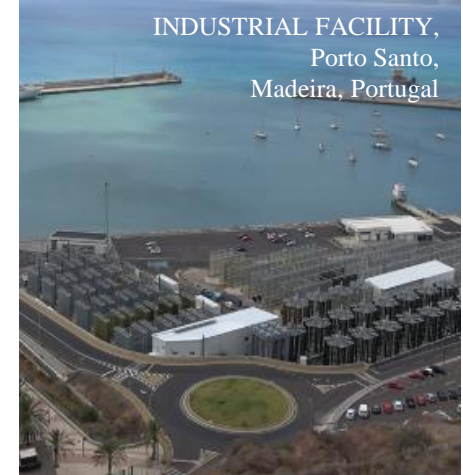
2013

- Half of the industrial facility constructed.
- R&D > Patent registration of our technology.
- Start of marine microalgae biomass production for biofuels.



2016

- Inclusion of **FOOD, FEED** and **COSMETICS** into priorities of valorization.
- New warehouse for microalgae processing (GMP quality standards).
- Multiple strains production.



INDUSTRIAL FACILITY,
Porto Santo,
Madeira, Portugal

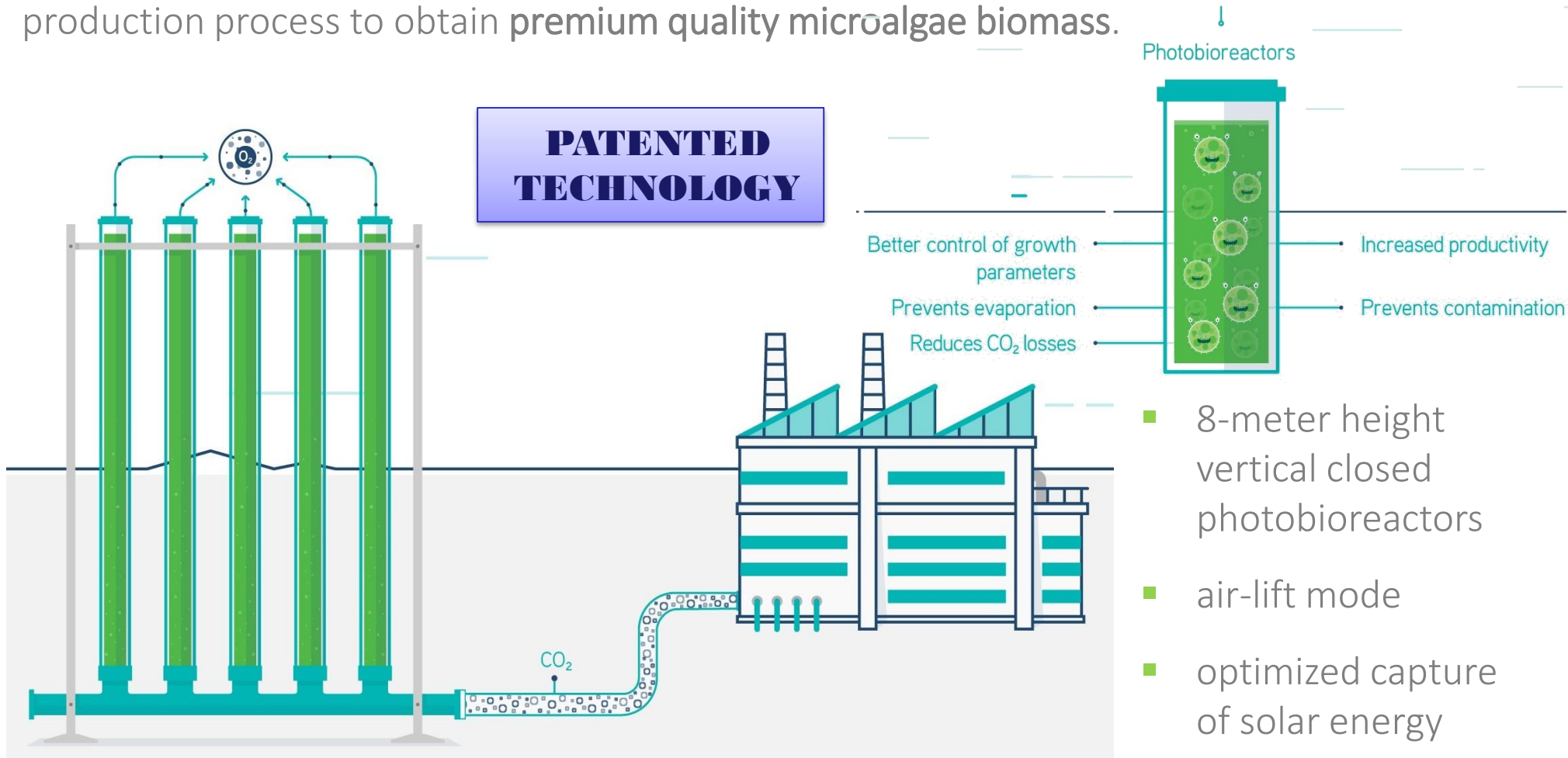
2018

- Formal Inauguration
- Production capacity: up to 100 T dry weight/Year
- Launch of product brands for Food & Nutrition, Feed and Cosmetics



THE BUGGYPOWER INDUSTRIAL PRODUCTION TECHNOLOGY

Our production technology evolved from an initial model focused on producing biofuels, with CO₂ capture and GHGs treatment, to the complete integration and control of the production process to obtain premium quality microalgae biomass.

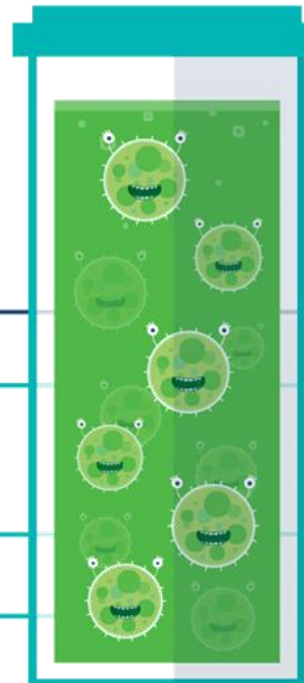


THE BUGGYPOWER INDUSTRIAL PRODUCTION TECHNOLOGY

□ Our proprietary production technology:

- 8- meter high closed photobioreactors
- Air-lift system
- Optimized capture of solar energy
- Excellent control of cultivation parameters
- Cost-effective and energy efficient

Photobioreactors



Better control of growth parameters

Prevents evaporation

Reduces CO₂ losses

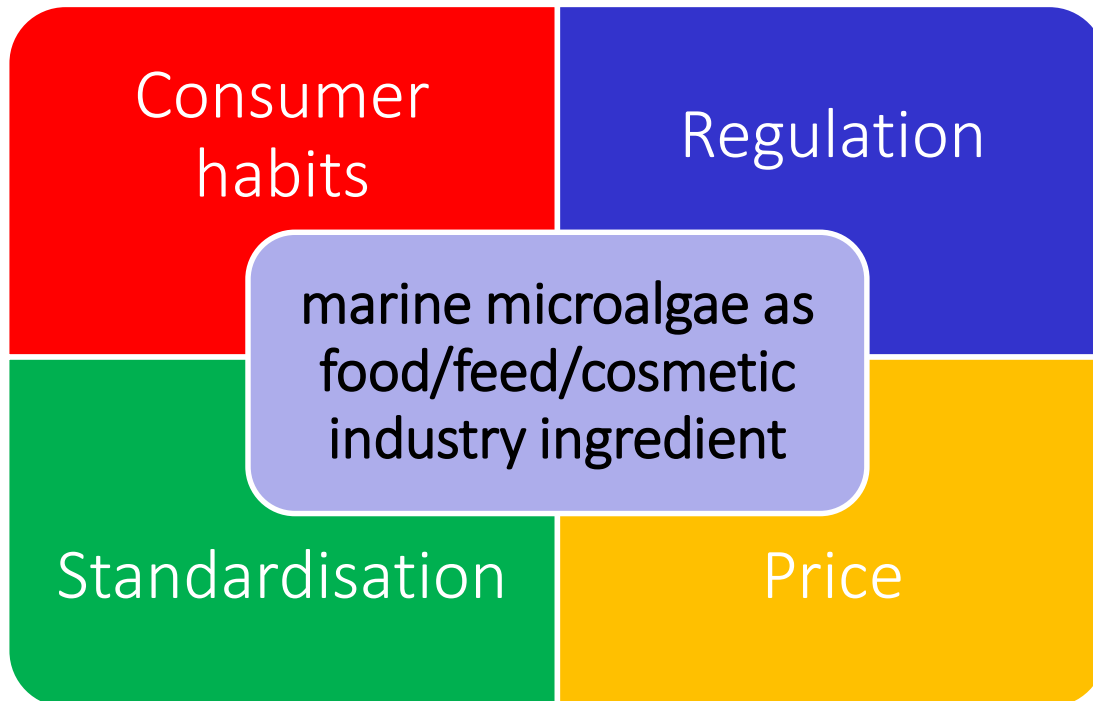
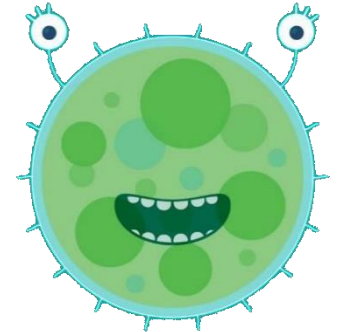
Increased productivity

Prevents contamination

INNOVATION IN THE DEVELOPMENT OF PRODUCTS BASED ON MICROALGAE

INNOVATION is part of our Company DNA and is **absolutely necessary** when your basis product is a new ingredient.

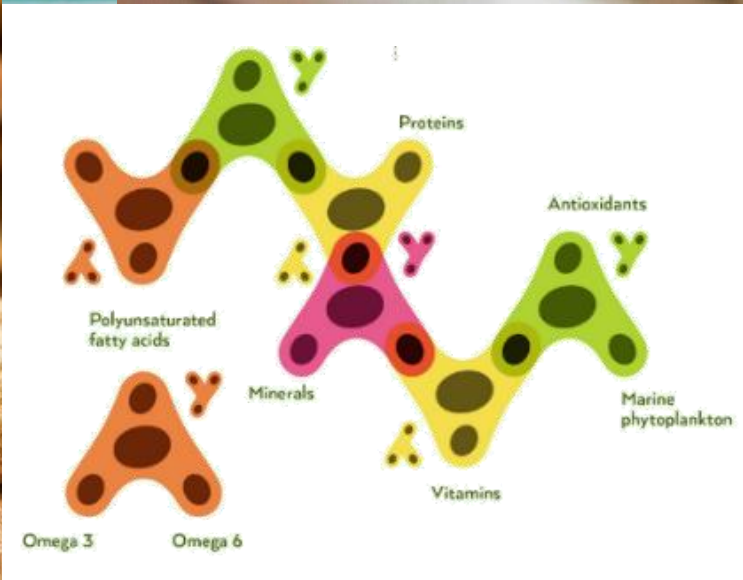
To introduce marine microalgae as a food, feed or cosmetic ingredient is not an easy task in demanding markets and many drivers and barriers affect this innovation process:



To succeed, all these points must be considered along all the **INDUSTRY VALUE-CHAIN**, but taking **CONSUMERS** as the central element.

DEVELOPMENT OF HIGH VALUE-ADDED PRODUCTS USING MARINE MICROALGAE

PRODUCT DEVELOPMENT



PRODUCT DEVELOPMENT



ALGUIMYA
The MICROALGAE EXPERIENCE

ALGUIMYA É UM ESPAÇO PARA CONHECER
E PROVAR O PODER NATURAL DAS MICROALGAS MARINHAS.
ESTAMOS ABERTOS PARA NOVAS EXPERIÊNCIAS
E VOCÊ, ESTÁ?

ALGUIMYA IS A PLACE TO GET TO KNOW
AND TASTE THE NATURAL POWER OF MARINE MICROALGAE
WE ARE OPEN TO NEW EXPERIENCES
ARE YOU?

alguimya.com



PRODUCT DEVELOPMENT - FOOD

We have two resident chefs who prepares food dishes based in our marine microalgae. Consumers, food bloggers & influencers come to taste our dishes, to provide us with their valuable feedback.



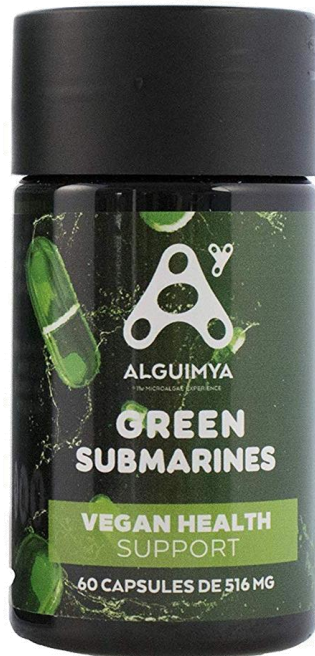
Come and meet us! hello@alguimya.com

PRODUCT DEVELOPMENT – FOOD SUPPLEMENTS

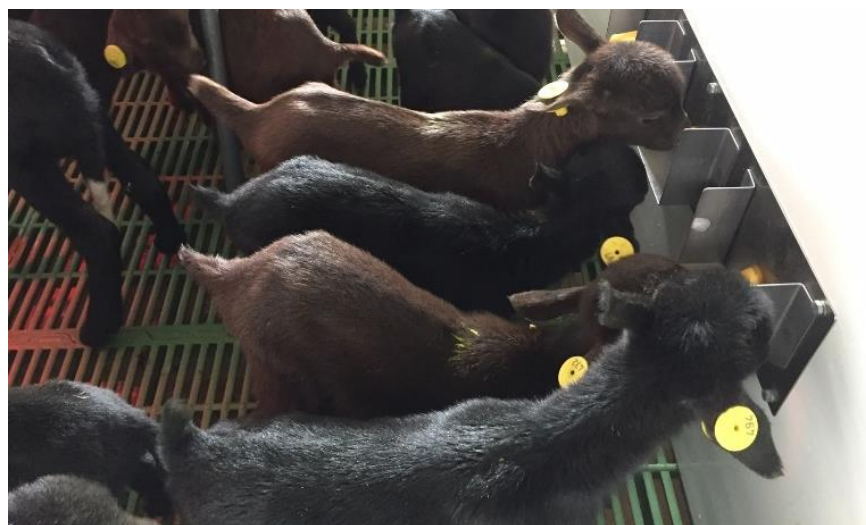


ALGUIMYA

The MICROALGAE EXPERIENCE



PRODUCT DEVELOPMENT – ANIMAL FEEDING



PRODUCT DEVELOPMENT – ANIMAL FEEDING



TRIFECTA TROPHEEE

ENERGY
ENDURANCE
ENJOYMENT

CARAMEL FLAVORED RACEHORSE TREAT
ENRICHED WITH MARINE MICROALGAE

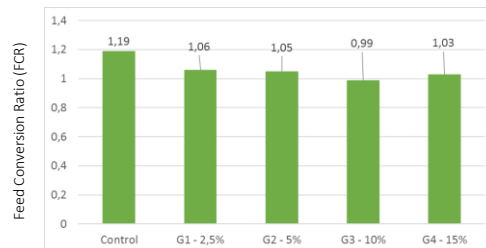
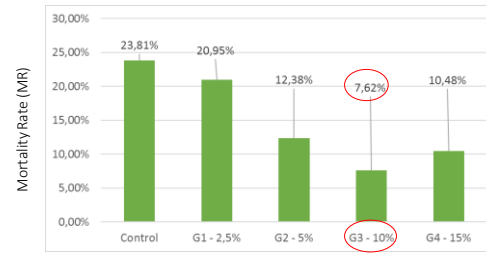
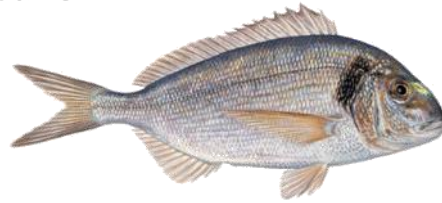
**A DAILY REWARD FOR
HEALTH AS A SUPPLEMENT
TO A NORMAL ANIMAL DIET**

- Complementary feed
- Increases the power of every kind of racehorse before the exercise
- Reduces fatigue during the execution
- Facilitates the restructuring of the body condition after the practice
- Contributes to daily health and wellbeing

**BUGGY
POWER**
Microalgae
life creators

PRODUCT DEVELOPMENT – ALGA FEED PROJECT

Marine microalgae also will play an important role in the future of animal feeding, like aquaculture.



PRODUCT DEVELOPMENT – ALGAFEED PROJECT

- ❑ It is not new that **marine microalgae** are said to be the **cornerstone** of fish-feeding sustainability in aquaculture.
- ❑ The **sustainable growth of aquaculture** lies largely in the use of marine microalgae as key ingredient for the healthy growth of fish and other aquatic animals.
- ❑ Marine microalgae are the **unique ingredient to increase in a sustainable way the content of ω -3 (EPA/DHA) fatty acids** in the humankind nutrition, since aquaculture has become one of the most important source of proteins for human consumption, and fish-oil world demand is clearly unsustainable.



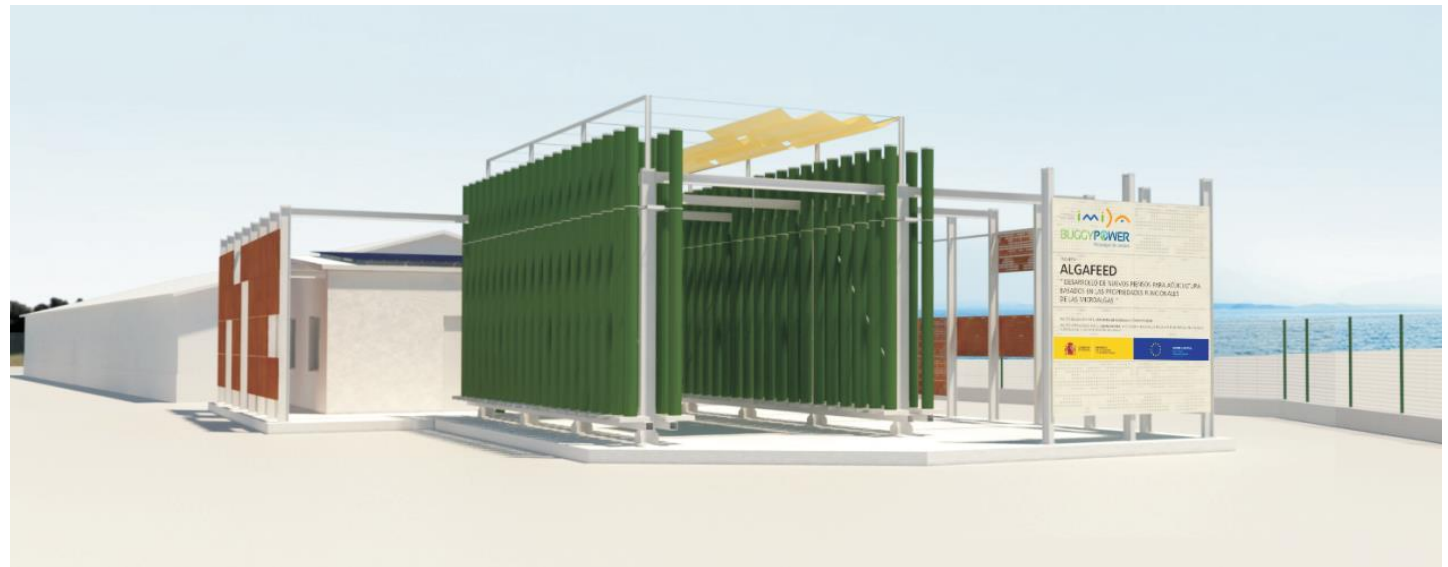
PRODUCT DEVELOPMENT – ALGAFEED PROJECT

- ❑ A number of fish-feeding and microalgae companies are developing and marketing their fish-feeding products by using algae extracts, and only a few using marine microalgae.
- ❑ The BUGGYPOWER's vision is to produce fish-feeding:
 - Based on high-quality marine microalgae grown in closed photobioreactors.
 - With proven effects on fish growing and health.
- ❑ The new products to be developed must improve:
 - The overall condition of the fish – its immune response, and its production performance.
 - The nutritional quality of its meat.



PRODUCT DEVELOPMENT – ALGAFEED PROJECT

- ALGAFEED project includes the construction of a **small pilot plant** for the production of different microalgae strains used lately in the fish-feeding production.



- The ALGAFEED plant will help to:

- Test the last technology improvements on BUGGYPOWER's microalgae industrial production system.
- Test climate adaptation of the several microalgae strains used.



PRODUCT DEVELOPMENT - COSMETICS



LA SAGESSE
*THE WISDOM
OF MATURE SKINS*

A cocktail of powerful anti-aging assets is about to revolutionize your skin.

La Sagesse is the line of BLUEVERT formulated to treat mature skin. Based on EPIGENÉTICS and together with the innovative marine complex Plasmarine™ has the highest number of active ingredients and in the maximum concentration of the market. Your cocktail of pure assets works in energy to achieve EXCELLENCE as the only result.

Combining botanical resins, bio-marine collagen, hyaluronic acid, peptide complexes and vegetable oils together with the star ingredient Plasmarine™ make this formula an unprecedented anti-aging pump.

DEVELOPMENT OF HIGH VALUE-ADDED PRODUCTS USING MARINE MICROALGAE

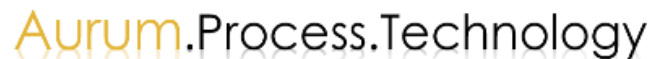
OUR COLLABORATORS



Cofinanciado por:



UNIVERSIDAD DE ALMERÍA





BUGGYPOWER

Microalgae life creators



BUGGYPOWER
Microalgae life creators

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