

CASE STUDY

Practical help for businesses

Seaweedology



European Union
European Regional
Development Fund



Seaweed has been used for food, animal feed and fertilisers for centuries, and is also used for a range of biomedical and industrial purposes globally.

There has become an increasing interest in seaweed aquaculture in recent years, driven by research into algal biofuel technologies along with the benefits of oceanic carbon sequestration.

Seaweed farming is currently in its infancy stage in the UK.



While seaweed production has doubled in recent years, only a fraction of global seaweed cultivation currently takes place outside of Asia.

With long stretches of suitable coastline, UK seaweed farming can offer sustainable production of kelp whilst playing an important role in carbon sequestration and the reduction of greenhouse gas emissions.

Case study

Seaweedology Ltd, originally founded in the West Midlands, is looking to establish a sustainable seaweed aquaculture facility on the coast of Tenby and Caldy Island in Pembrokeshire, West Wales. Their aim is to develop a sustainable and eco-friendly way to enable long-term kelp farming in the UK for human consumption and industrial applications.

The kelp production sector has consistently grown throughout the world, and will only become more in demand with increasing environmental regulations. Seaweedology proposes the establishment of its first 4-hectare seaweed farm off the Pembrokeshire coast, to allow the growth of kelp seaweed on ropes for human and animal consumption, and the production of bioproducts.

Their farms will also foster sustainability by improving the local eco-system safely and protect marine life, by adopting farming technologies that aid in the seabed's protection and encourages growth of different marine life around the lines, whilst being a fully carbon negative business, due to carbon sequestration.

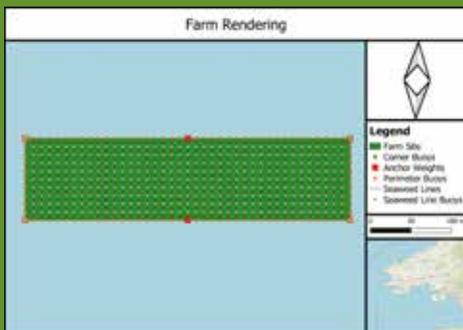
Seaweedology required grant funding in order to support the initial investment to finance the establishment of their proposed aquaculture facility.

Company background

Seaweedology was founded by Simon Pitt in 2020. After a long and successful career in engineering and corporate business management, Simon wanted to start a new project which helped the environment, and identified seaweed farming as an exciting venture to invest in. As seaweed farming is in its infancy stage in the UK, Simon connected with Alec Watt, owner of Green Ocean Farming, the only UK company in the aquaculture sector with projects from the South Atlantic, West Africa, Caribbean, Oman and offshore/deep sea projects. Alec is one of the UK's leading experts in seaweed farming, with over three years' experience farming kelp and other marine algae, such as Ulva, Knotted Wrack and Bladder Wrack, for methane reduction in cattle and medicinal extracts for diabetes treatments. Alec then became Simon's business partner in Seaweedology, taking the role of technical director, and together they identified the Pembrokeshire

coastline as an optimal area to begin the new venture. The region currently has no other commercial or large-scale seaweed businesses, but excellent conditions for the growing of kelp and available areas of sea with low levels of leisure and commercial activity.

Their aim is to develop a sustainable seaweed aquaculture facility, growing native kelp seaweed (*Saccharina Lattissima*) on ropes along 20 submerged parallel 100m lines, suspended from 6 x 1 tonne weighted buoy long lines. The first cultures are expected to enter the water in October 2021 and will be harvested April 2022. The weighted anchors they will be utilising, use a design called Reef Cubes, which are manufactured by an eco-friendly company, ARC Marine of Brixham. The anchors ensure no concrete is used, but a textured surface to encourage marine life to grow on them.



Process



Farm site
selection



Farm design



Licence and
lease applications



Install farm
infrastructure



Growing stage
(Oct – May)



Harvest

The ropes would be impregnated with kelp spawn in a lab 24 hours before entering the water. The lines are then placed approximately 10m below the surface of the water and are expected to grow between 1-2m of kelp along each line over a 7-8 month period. The optimum period for the lines to be in the water is between October and May, when the UK sea temperatures are most suitable for growing kelp. The lines are then lifted by crane and the kelp hand-cut from the lines. The kelp is then sent to a drying facility where it is dried for 2-3 weeks then packed and shipped to its buyers. During the growing period, it is sequestering carbon from the ocean, and can therefore help businesses in offsetting their carbon footprints, along with developing new products from biomass.

In order to proceed with the set-up of their first farm, Seaweedology started the licencing process in August 2020 with Natural Resources Wales for a proposed 4-hectare farm. Each 100m line will produce up to 1500kg of wet seaweed (equivalent to 1000kg in dry weight), with Seaweedology planning to produce approximately 30,000kg of kelp each year.

The licencing application includes a detailed consultancy process with numerous Pembrokeshire groups, as agreements are needed by all parties that could be affected by the farm, e.g. leisure crafts, fishing boats and harbour masters. Seaweedology are expecting the licencing to be approved imminently, with the process experiencing delays to date due to Covid-19.

Simon was seeking further investment towards capital expenditure costs, and was recommended to contact the Energy & Bioproducts Research Institute (EBRI) at Aston University to assist Seaweedology with funding applications for their first farm set-up. Simon also asked for EBRI's assistance in researching the amount of carbon that would be sequestered by a kelp farm the size Seaweedology are planning to install.

Support from EBRI

Help to identify new market opportunities

EBRI's research identified several funds that Seaweedology may be eligible for and details on how to explore and apply. They were also able to help Seaweedology with the research necessary for applications to groups like the European Maritime and Fisheries Fund (EMFF).



"The help and assistance provided by EBRI was exactly what we were looking for. Funding applications required a lot of research, and I believe EBRI have increased the opportunity of securing funding significantly".



Simon Pitt
Founder, Seaweedology Ltd.

Findings/conclusions/ outcome

"We are very keen to continue working with EBRI. It is a great partnership and there are a number of ways EBRI can help with future projects and research that could have huge benefits across the whole aquaculture industry".



Simon Pitt
Founder, Seaweedology Ltd.

There are a number of ways EBRI can continue to help, such as researching further future funding opportunities, assisting grant applications and development aid, along with research on kelp carbon storage capacity. EBRI's team of chemical engineers can assist Seaweedology with algae guidance, feedstock analysis and the development of new technologies in kelp farming, which would see benefits across the aquaculture industry around the globe. Seaweedology are planning to double their farm space each year, in similar locations around the UK coastline.

Seaweedology are also collaborating with EBRI to develop practical biomass implementations that will reduce the UK's carbon emissions in line with the net-zero emissions by 2050 target. Major markets are under development for UK seaweed, crossing several product areas both domestically and internationally, particularly around the

production of biofuels. The biomass can be converted into biofuels that could potentially substitute fossil fuels in numerous sectors, including aviation and naval applications. As part of his business plan, Simon is planning to engage with EBRI regarding collaborative research opportunities which could help his company innovate and expand, under several funding schemes such as Knowledge Transfer Partnerships (Innovate UK) and European Partnerships (Horizon Europe).



The Energy & Bioproducts Research Institute (EBRI) at Aston University provides practical solutions for businesses to explore the growing bioenergy, Energy-from-Waste (EfW) and bioproduct markets, and the opportunities they offer.

To discover more email:
bioenergy@aston.ac.uk
or call 0121 204 3383
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