Innovate UK, BBSRC and EPSRC

BIOMARA

Navigating the Feasibility of a Cascading Seaweed Biorefinery for Next-Gen Products

BioMara manufactures products from ocean-farmed seaweed for sale into functional foods, nutraceuticals, cosmetics and other markets. Here, founder Jay Dignan, shares how a SusBioMM-funded feasibility study enabled BioMara to investigate the development of a sustainable biorefinery to manufacture products from residual streams.

"The feasibility study got us started on the pathway to commercialisation. It was an impetus to start the process: gathering data, giving us confidence in what we had, and enabling us to allocate time and resources to make a plan for where to go next."

The economic and environmental opportunity

BioMara's main focus is to extract and purify the high-value components that make up a small proportion, 5-30%, of the overall seaweed biomass. The BioMara team understood that there were significant environmental and economic opportunities in valorising the whole seaweed biomass moving towards a zero-waste process. For instance, many of the components derived from the biorefinery residual streams are sustainable alternatives to petrochemical-based products.

Ocean farming of seaweed feedstock has many benefits, including providing fish habitats, protection against coastal erosion, removing nitrogen and phosphorus from the ocean, and as a carbon sink.

Creating co-products from residual seaweed biomass makes economic sense too, potentially increasing profits

"In manufacturing you have a chicken and egg problem: as a startup you can't produce at the price point for a client because you haven't got the investment, but you can't get the investment until you get clients and sales. These grants help solve that by moving us along the road towards a product that's ready for market."

for processors like BioMara and their suppliers, many of whom are in economically challenged coastal communities.

While this is exciting for sustainability and product development, it can be a difficult business proposition for a start-up because of the challenge of scale and competition from cheaper, non-sustainable sources.

Investigating the feasibility of new products from residual streams would have been difficult for BioMara without funding, because they couldn't risk diverting resources from their main products.

Customers, potential collaborators and confidence in the route to market

For Jay, a key outcome of the feasibility study was building knowledge about the residual streams and their market potential. Through data collection, testing and new product development efforts – even putting products in the hands of potential customers – the team gained confidence in the all-important route to market.

The funding enabled BioMara to build a closer relationship with their collaboration partner, supplier Kelp Crofters Ltd. Visiting KelpCrofters' base and farm operations helped the team to develop a deeper understanding of harvesting and primary processing in the supply chain.

Taking part in events and conferences helped the team consolidate learning, disseminate information, and reach potential customers. They also connected with other potential customers who could help them develop and valorise co-products from the biorefinery residual biomass streams.

And finally, for BioMara, this study led to further opportunities through the Better Food For All project, another Innovate UK-funded grant.

"It's all about getting market traction. We've got potential customers lined up for a functional food ingredient that we might not have had without this project because we were able to investigate how we can best valorize that stream and what it could be used for."

Find out more about the Sustainable Bio-based Materials and Manufacture (SusBioMM) Programme

What would Jay say to other businesses applying for funding?

"Don't try to go for all of the grants. Be selective so you do a good job in the writing of the application and make sure they fit with your business aims so they don't become a distraction from your main focus."