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COMPANY PROFILE

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BLACKFISH

BLACKFISH ENGINEERING

The Innovators' Engineer Dives Deep to Solve Complex Challenges

PRODUCTION:
David Hill

True innovation starts when you clearly understand the problem you're trying to solve. This mentality guides every project at Blackfish Engineering, where the team works to identify and solve challenging issues in the offshore renewable space. Co-founder and Director Tim Warren tells Energy Focus more about projects and partnerships that are helping this bright engineering firm expand its horizons.


BEN CROM

In the UK's evolving energy landscape, offshore renewables are increasingly recognised as a cornerstone of the net-zero transition. While wind and solar dominate much of the current infrastructure, tidal and wave power bring advantages of predictability and consistency that can strengthen the overall energy mix. As the UK Government points out, wave power is far more abundant than wind or solar, and tidal flows are predictable and consistent, offering the potential for reliable baseload renewable energy. Although these technologies are at an earlier stage of commercial development than wind, innovation is advancing rapidly. Bridging that gap requires engineering expertise, perseverance, and innovation – qualities that lie at the heart of Bristol-based Blackfish Engineering.

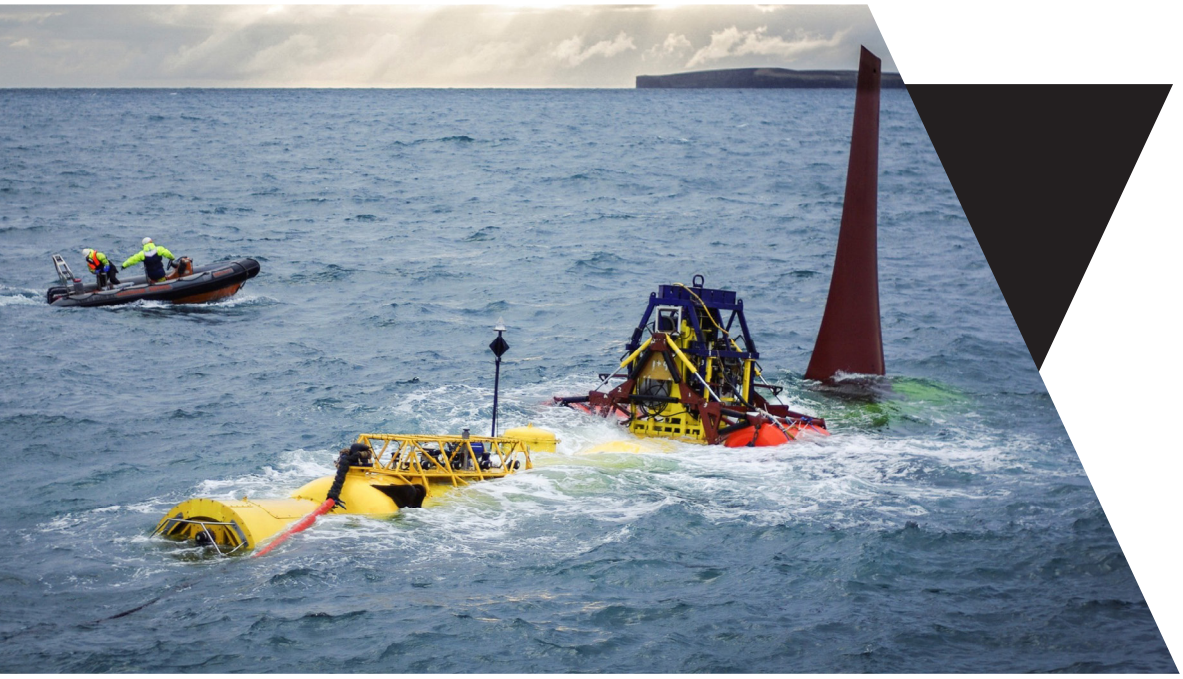
Founded in 2016, the company has built a reputation as a partner for innovators across the clean tech spectrum. Blackfish helps clients develop ideas from concept through early-stage development, guiding them through Technology Readiness Levels (TRLs), and helping prepare for commercial deployment. From tidal turbines to offshore charging systems, wave energy converters, floating wind anchors, and even hydrogen test rigs, the business has demonstrated its ability to help clients turn vision into reality. Director Tim Warren tells Energy Focus that this hands-on approach has been central since day one: "We specialise in helping early-stage technology developers. As a team of engineers, we have extensive experience in that early TRL stage, developing products and helping to prove and demonstrate market viability."

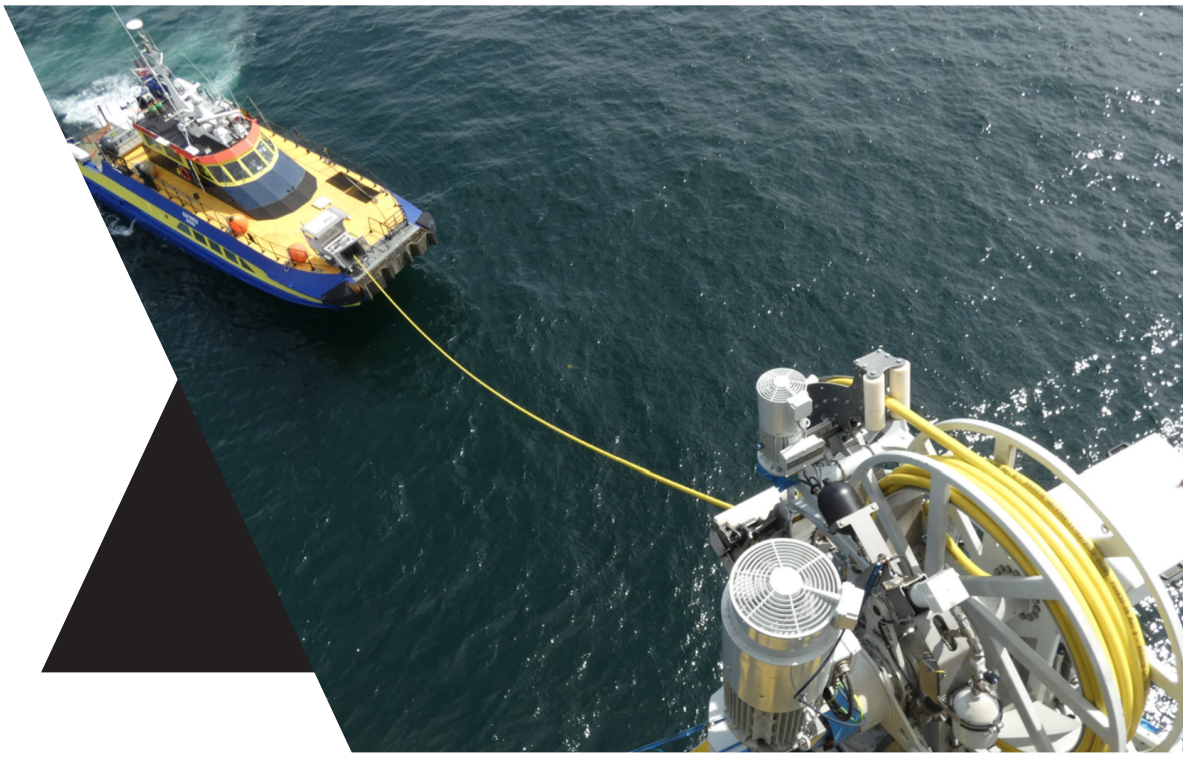
FROM REDUNDANCY TO RESURGENCE

The origins of Blackfish can be traced back to Tidal Generation Ltd, a leading tidal developer at the time and a pioneer in tidal stream turbines. When its parent company, General Electric, decided to close the business in 2016, the engineers who had designed and operated tidal stream turbines off Orkney suddenly found themselves needing to find new opportunities, but firmly believed their collective expertise was too valuable to lose.

"Blackfish was founded by former Tidal Generation Ltd engineers, six of whom remain with the business today," Warren recalls. "We were all made redundant in 2016. We had so much valuable knowledge and hands-on experience in the offshore renewables sector that it simply couldn't go to waste." Within weeks, Blackfish was established and soon working with other tidal stream developers. The business grew quickly, enabling the team to bring in familiar faces.

"Quite quickly, we won contracts that allowed us to expand. Our first three employees were former colleagues from Tidal Generation. We continued to grow, moving





into new sectors. Tidal stream has a lot in common with wave power, so moving into that sector was a natural progression, and we've been actively involved ever since."

This adaptability has remained a hallmark of the company. Over time, the team has expanded its expertise across the entire clean tech spectrum - from tidal and wave energy to offshore wind, floating solar and beyond - always keeping innovation at the centre of every project. Even the company's name reflects this spirit of flexibility. As Warren explains: "Just before we set up the company, our Managing Director had been in Vancouver watching Orca whales in Blackfish Sound. When he mentioned the word 'Blackfish', we all agreed it was memorable and unique within the sector. We wanted a name that didn't constrain us to one technology - something that could grow with us as we developed new solutions across the clean tech industry. It really sticks, and people often remember it when we engage with them."

THE TIDAL OPPORTUNITY

Having lived through the early promises of tidal energy, Warren is realistic about the challenges the sector faces, but equally convinced of its importance. "Fundamentally, this industry is still developing - roughly 20 years behind wind - but its potential is enormous," he says. Unlike wind or solar, the tidal sector has struggled with scale and consistency of investment. Yet Warren is clear that abandoning it would be a mistake: "I would argue that if you believe that climate change is something we can and should be dealing with, we need every single form of renewables to combat it. This is not a challenge that can be addressed with just wind or solar. We need wave, tidal, biomass, nuclear, solar, wind, and every other form of renewables that can provide cost-effective alternatives to fossil fuels. It is a huge challenge, but we should never underestimate human ingenuity

Tim Warren, Founder & Director

to innovate and solve problems."

He recalls the days when optimism perhaps overtook reality: "In 2007, I was phoning suppliers looking for gearboxes, telling them that we planned to have 100 turbines in the water by 2015. Of course, that promise didn't materialise, and I think that the industry had been guilty of overselling." Yet, as he notes, excitement has always been necessary to secure investment: "Every industry needs a story about where it's headed, and ours is no different. While some say we can't afford to reduce carbon, I believe we can't afford not to, especially when you consider the cost of environmental disasters."

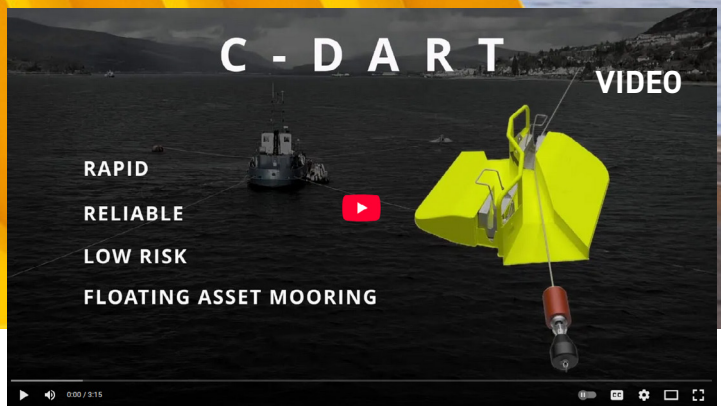
// WE HOPE TO EXPAND GLOBALLY WITH EU AND US CLIENTS TO DIVERSIFY OUR BASE AND REDUCE RELIANCE ON A SINGLE UK MARKET. //

PARTNERSHIP IN ACTION

Blackfish's model is built on deep collaboration. The company doesn't just design technology; it stands beside its clients in workshops, fabrication yards, and offshore sites.

The partnership with Mocean Energy exemplifies this approach. "We have been working with Mocean Energy for many years and we are their mechanical design partner," Warren explains. "Deep collaboration has enabled Blackfish to design all aspects of the device, from the main structure through to key components such as the cable penetrations." That involvement spans the entire engineering spectrum, from CAD modelling, design and analysis through to manufacture and commissioning. "It's not just design work – we are happy to get our hands dirty. We love supporting our clients with all aspects of their projects: assembly, testing, commissioning and operation, to help get their technology online."

Another flagship partnership is with MJR Power, where Blackfish has been instrumental in creating solutions for offshore charging. As vessels



become hybrid or fully electric, the need to recharge at sea becomes critical. "Together, we have developed and tested, off the coast of Belgium, what is effectively the world's first on-turbine connection system," says Warren.

Testing proved successful last summer, and work is now focused on the next iteration. The collaboration blends the strengths of both businesses: "MJR Power are experts in electrical and systems engineering, and we provide mechanical engineering and structural analysis expertise, and together we make a really great partnership. As well as working with MJR during concepting and detailed design, we have also managed manufacturing and been on site to assemble and test the equipment."

Offshore charging goes beyond servicing offshore wind. Warren sees vessel charging applications across ports, ferries, fishing vessels, and even autonomous craft. "Port charging represents a major opportunity. We completed a landscape study for a leading clean-energy organisation, looking at port infrastructure and architecture updates that would be needed to facilitate vessel charging. A significant part of the future shipping is autonomous vessels. Underwater, survey, or surveillance vessels that work autonomously are more and more common, and there is a major offshore charging opportunity in that space."

ANCHORS OF THE FUTURE

Beyond turbines and charging, Blackfish is helping solve some of the most fundamental offshore engineering challenges. With support from Wave Energy Scotland, the company has developed a quick connection mooring system, tested at full scale in Fort William and now edging closer to commercialisation.

The C-Dart is a mooring technology designed for use in the offshore renewables space. It can quickly, effectively and safely connect various types of offshore infrastructure. By offering rapid and safe connection and disconnection, the system

enhances offshore safety, reduces time dramatically, and delivers significant cost savings. No longer will operational personnel be required to handle heavy mooring lines, and operations will be less constrained by sea conditions.

Meanwhile, Blackfish's collaboration with Reflex Marine is targeting the costly problem of anchoring floating offshore wind turbines. Warren highlights the benefit: "The key advantage is having one anchoring system wherever you are, regardless of geology. If you have a very large floating windfarm, you might need several different anchoring systems depending on the local geology, such as sandy, clay or rock seabed conditions. This anchoring concept uses the well-established principles of deep-hole, small-bore drilling, in combination with a unique grouted anchor, meaning that the same anchoring type can be used for every turbine in the field, resulting in significant cost savings."

Blackfish provides mechanical design expertise, while Reflex brings specialist operational and geotechnical knowledge, combining strengths of both organisations to deliver a robust and cost-effective solution.

Looking forward, Blackfish sees opportunities to expand both geographically and technically. Scotland remains a priority, as does building new capabilities to better serve innovators.

"We plan to continue building our team, with immediate growth in Scotland, and to strengthen our internal capabilities, particularly by expanding the range of analysis techniques we offer to innovators. We are initially expanding into EU and US markets to diversify our client base, which will help us build the business and be less reliant on a single UK market."

But the company's ambitions go beyond marine renewables. Its expertise in innovation translates across many areas of clean tech. "Until now, we have been focussed on offshore renewables, but we have realised that the skills we have are applicable to all forms of clean tech. We've been working on floating solar and hydrogen and carbon capture projects. All projects require

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innovation and it's all about helping clients to de-risk their technology and improve investor confidence."

Warren stresses that innovation is not just about ideas, it's about the process of developing them. "A lot of innovation happens when a group of talented people come together around an idea. It is incredible how quickly an idea can develop when you have a few knowledgeable people in a room. Our team of experienced engineers brings both creativity and technical know-how, and it is important to have the freedom to think outside the box." By combining structured problem-solving with original thinking, Blackfish helps clients explore new possibilities. "Often, clients have spent a lot of time focused on their own idea. We guide them through the innovation process, breaking the mould and bringing imagination and practical solutions to the table, sometimes suggesting entirely different approaches when that is the most effective way to solve a problem."

These engineering innovations illustrate how Blackfish tackles fundamental sector challenges while also looking ahead to broader opportunities.

A FORCE FOR CLEAN ENERGY

From its roots in redundancy to its current position as a trusted partner for offshore renewables, Blackfish Engineering is a testament to resilience and ingenuity. Its mix of technical excellence, industry knowledge, and collaborative spirit has helped it carve out a role as the "innovators' engineer." And its work already stretches far beyond wave and tidal, into offshore wind, shipping, hydrogen, and beyond.

"Ultimately, we want renewables and decarbonisation to succeed, providing clean power for the future," Warren concludes. "Our strategy is that we will be involved in decarbonisation, however that might look, whether that be clean power generation or reducing carbon emissions. For example, we worked with Airbus previously, developing a test rig that helped them prove their hydrogen fuel cell technology."

For an industry still seeking its commercial breakthrough, the ability to take risks, test ideas, and challenge conventional wisdom is essential. True to its name, Blackfish Engineering is navigating uncharted waters, demonstrating that innovation and partnership can unlock clean energy from the seas.

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