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THE POWER OF ter

Where engineering excellence meets clean energy demands, Flumill leads at the forefront of innovation

Drawing experience and expertise from all corners of the Norwegian oil and gas industry, Flumill is making waves in the green energy transition. Keeping nature at the fore, the company's mission is to be recognized for pioneering innovative technologies and configurations that produce renewable energy from the natural flow of water, with minimal effect to marine ecosystems. Flumill's journey began back in 2002 with Jan Inge Eielsen, a Norwegian inventor from the oil and gas industry who devised an idea of using a helix as a turbine for energy production. Keen to turn Eielsen's initial conception into reality, Karl Tore Pedersen and Jon Inge Brattekaas – the founders of subsea EPC company, CSUB – took over the system's development process in 2010 and, over the course of the next decade, transformed the primary geometry into the effective design that exists today.

As Flumill sets to embark on the next stage in the system's launch, *New Energy Today* spoke with Andreas Brobakken, Senior Engineer at Flumill, who shared insights into the research and development process behind the configuration, as well as its benefits in the clean energy transition, both in Norway and beyond. Andreas starts by detailing the extensive testing and development process that helped to formulate the efficiency, adaptability and effectiveness of the final design.

"When it comes to the research and development of this system, we've already completed the basic and most important parts of the process," Andreas begins. "Once we'd established an acceptable proof, we tested the prototype in Norway first – which we funded completely – and then moved it out to the EMEC (European Marine Energy Centre). We tested the unit in the water, not to produce electricity to the grid but to test and verify our simulation models, which we found was very close to reality and so a very positive outcome. Because of this, we can now use our simulations model for almost any kind of development. We've now developed

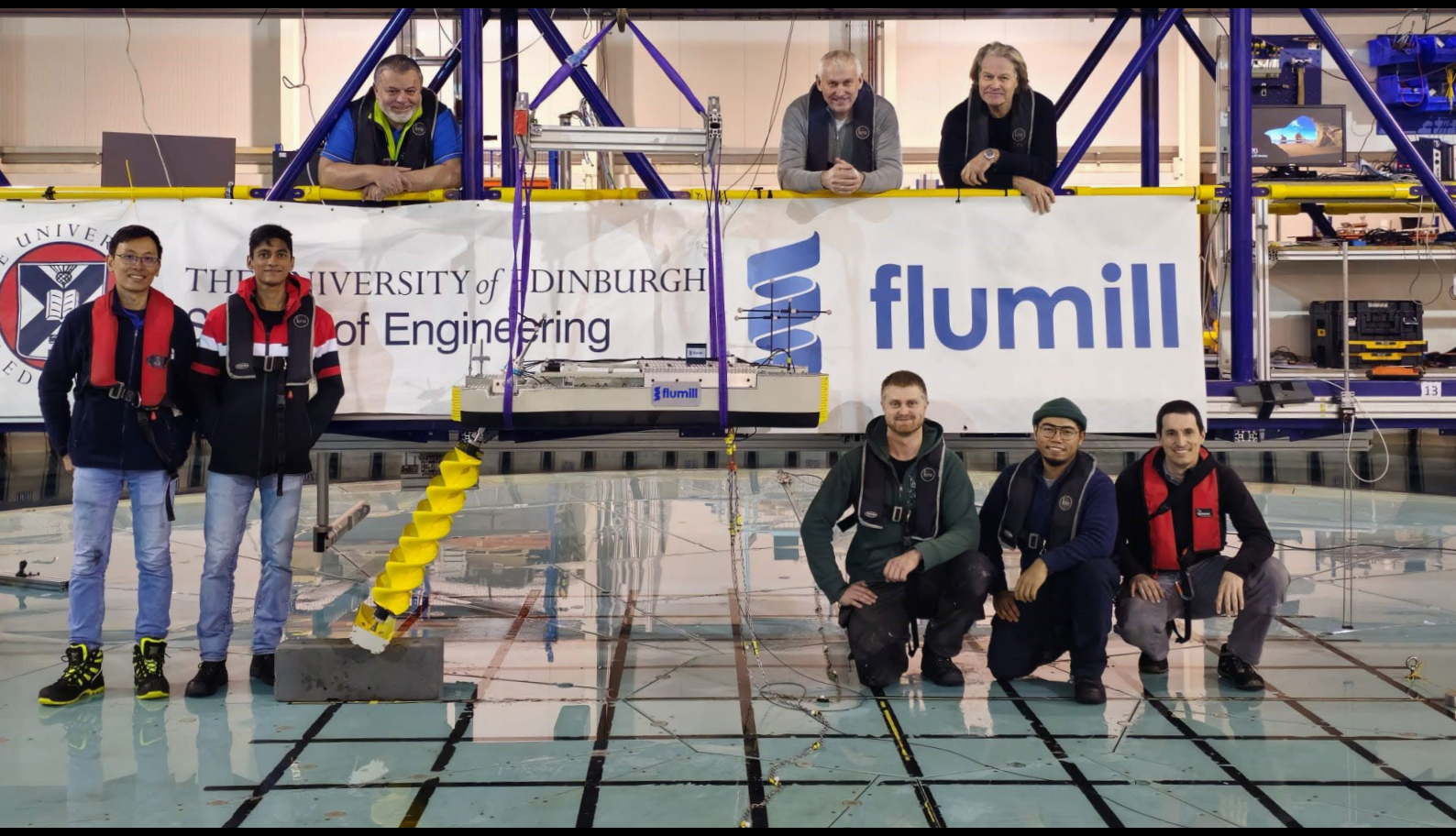
multiple configurations that can be in almost any kind of water flow, so it could work in rivers, secondary hydro applications, for fish farming, and in areas where you need to generate power locally away from the grid. It can be used in shallow areas with the horizontal unit, in deep areas with the seabed unit, and the floating units can be used in more remote areas. It can also be used in integration with other technologies, such as those for solar or desalination.

"There's been a lot of interest surrounding these fluid systems. With its multiple potential project pathways, people are starting to see the potential for this technology and what we could offer, especially with the diversity of the turbine within all of these configurations, its resilience against collisions and its friendliness to marine life."

◄ **Andreas Brobakken, Senior Engineer**

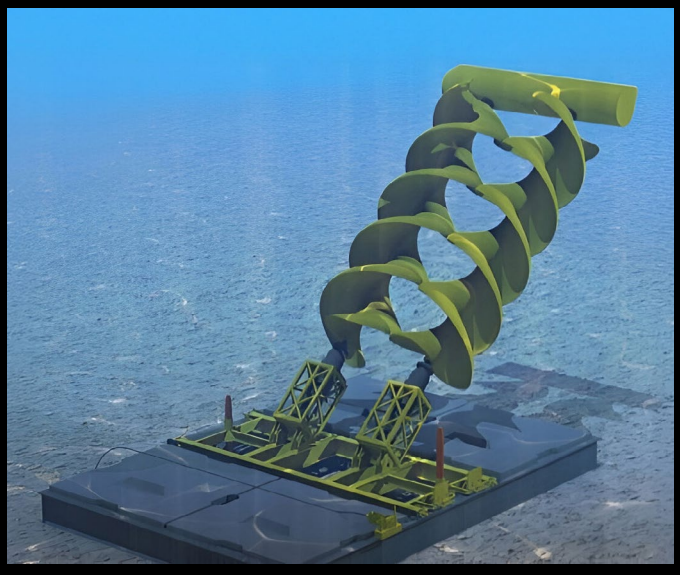
Focused on formulating a sustainable, scalable solution for the future, Flumill acknowledges that a renewable energy system cannot remain viable if it poses damage to the surrounding environment. Throughout its development process, Flumill has prioritized certain measures to minimize the configurations' impact on marine life.

"For the more conventional type of horizontal turbines, the rotating blades will have very high velocity at the wing tip. However, our system operates at a lower wing tip velocity than the surrounding water," Andreas explains. "The lower velocity creates less cavitation, resulting in less turbulence, less noise, and a friendlier solution towards marine life."



With most of the development and testing complete, the next stage is to take the system to market. Thanks to its variation and adaptability, the technology can be installed into a vast variety of different environments and applications, providing solutions to a wider scope of customers.

"The next phase will be the commercialization, seeing what we can do to bring costs down even further and get more sales. That, combined with targeting the right kinds of markets and customers with incentives beyond just the energy price such as in industrial parks, coastal areas with poor grid capacity, etc. will be our strategy, especially in the beginning. These potential customers want to talk to us because they are in areas with insufficient access to green power and because they are not granted enough capacity to initiate their projects. A great deal of green development is happening in these coastal areas, but to launch those projects, the energy production needs to be local. Having the production facilities within close proximity will help get these projects going and would make a good match between where the production is happening and where they need the power, particularly in areas with very few other renewable options," Andreas says. "For the longer term, we'll be looking for large facilities for power



production. The river configuration, for example, could be just around the corner. A year ago, we weren't planning to develop the river configuration much for the time being, but it turns out that there has been a lot more interest in that system than before, and it requires very little capital to commercialize given the level of public research and development that has already taken place. If we have the right funding available, it could be launched quickly. For the tidal configurations it might take a little bit longer due to funding and government approval, but we have begun that process and hope to have the horizontal configuration (for shallow tidal streams) in the water by early 2027."

Leveraging the power of water, Flumill is well-equipped to lead the renewable revolution with its state-of-the-art systems and inventive approach. As the world embarks further into the energy transition, Flumill will continue to prove that power generation problems can be solved both cleanly and effectively, as it looks forward to officially launching its innovation in the years to come. ■

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