

Carnegie and Blue Economy CRC launch MoorPower™ Project

Decarbonising offshore aquaculture

- \$3.4m MoorPower Scaled Demonstrator project launched
- Funding and support secured through the Blue Economy CRC and key industry players
- MoorPower product is a CETO spin-off that enables offshore vessels powered by waves

Carnegie Clean Energy (ASX: CCE) (“Carnegie” or the “Company”), a leading wave energy technology company, is pleased to announce the award of funding and launch of the MoorPower™ Scaled Demonstrator project in conjunction with prominent research institute, the Blue Economy Cooperative Research Centre (Blue Economy CRC). MoorPower™ is a CETO derived wave energy product designed for moored vessels and offers a solution to the challenge of securing clean and reliable energy for offshore activities, reducing reliance on diesel generation. The initial target market for MoorPower™ is offshore vessels such as feeding barges for the aquaculture sector, but the future market is broader and includes the many other offshore operations that require energy.

Over the next 2 years, Carnegie will design, install and operate a scaled demonstrator of the MoorPower™ technology just offshore from its headquarters and research facility in North Fremantle, Western Australia. This \$3.4m MoorPower™ Scaled Demonstrator project will be delivered with funding support from the Blue Economy CRC and in close collaboration with a consortium of partners including two of Australia’s largest aquaculture companies, Huon Aquaculture and Tassal Group. Academic and industry partners include DNV GL Australia, Advanced Composite Structures Australia, University of Tasmania, Climate KIC/Australian Ocean Energy Group, AMC Search and University of Queensland. The project is supported by \$1.35m cash from the Blue Economy CRC, \$265k cash from Carnegie and \$1.8m of in-kind support from all the project partners.



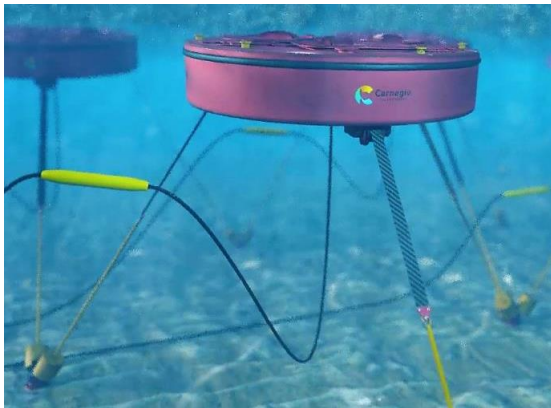
Impression of the MoorPower™ system aboard a feeder barge

MoorPower™ was developed by Carnegie with the goal of decarbonising the energy needs of offshore operations, particularly in aquaculture. As the aquaculture sector moves operations further offshore, operations such as feeding barges will no longer have access to shore-based power and the reliance on diesel generators comes with many associated costs, carbon emissions and environmental risks, including fuel storage and spillage risks while refuelling offshore.

This challenge presents an opportunity to utilise wave energy, an untapped energy source constantly flowing around offshore facilities. Ocean Energy Europe (OEE) forecasts significant growth for wave energy with a €653b market potential by 2050.¹

¹ Ocean Energy Forum ‘Ocean Energy Strategic Roadmap’ Paper <https://www.oceanenergy-europe.eu/wp-content/uploads/2017/10/OEF-final-strategic-roadmap.pdf>

MoorPower™ can be deployed for any type of moored vessel and is not limited to fish farming. Carnegie will continue to collaborate with key aquaculture companies to understand their requirements, constraints and challenges. Additional aquaculture technology providers, such as companies that build feeding barges, are also supportive of the MoorPower™ project. Carnegie's vision for the MoorPower™ product is that the technology will be an integrated solution with other offshore renewable energy systems including hydrogen and batteries.



Carnegie's CETO Technology

Carnegie has incorporated aspects of its proprietary core CETO wave energy technology into MoorPower™. The core CETO technology has a submerged buoy that sits a few metres below the surface of the ocean, moving with the waves. This orbital motion drives a Power Take-Off (PTO) system that converts the wave motion into electricity energy. MoorPower™ is a spin-off from CETO; it takes key CETO components such as the PTO and offers an alternative configuration for a new market application.

This new product launch is consistent with Carnegie's focus on the development and commercialisation of proprietary technologies to efficiently and cost-effectively convert wave energy into electrical energy. Carnegie's technologies have the potential to revolutionise marine renewable power, deliver innovative solutions to ocean industries and support global efforts towards decarbonisation and a more sustainable environment.

"We look forward to the opportunities the MoorPower™ technology presents to the aquaculture sector and the expansion into high energy offshore sites utilising clean and reliable energy solutions.

"The project allows the opportunity for collaboration between experts in the field led by Carnegie Clean Energy together with project partners across the country", commented Dr John Whittington, CEO Blue Economy CRC.

Mr Mark Asman, Head of Aquaculture, Tassal Group, also stated, *"As population increases, wild harvest stocks decrease, and farming land and freshwater is restricted, aquaculture is providing a source of renewable protein farmed through sustainable practices.*

"Partnerships like this ensure our industry continues to deliver the benefits of high-performance sustainable innovation, research and development (R&D) and change practices.

"Through the introduction of novel oceanic renewable energy sources, aquaculture will continue to offer healthy seafood produced with a low carbon footprint."

Carnegie’s CEO, Mr Jonathan Fiévez, added: *“We are extremely pleased by this collaboration with the Blue Economy CRC and leading industry partners which have come together around MoorPower™, a new wave energy product that delivers solutions to challenges encountered in the aquaculture sector.*

“MoorPower™ reduces or removes the reliance on diesel and provides clean, reliable, predictable energy to support the growth of a diverse sustainable blue economy. The technology also expands our market reach, while complementing the technical advancements being made on our CETO technology. We are excited to expand our product portfolio with the addition of MoorPower™ and are eager to progress and deliver both the CETO and MoorPower™ products to the market.

“The elegance of the MoorPower™ aquaculture application for Carnegie is that these barges constantly move with the waves already and we have the electricity customer and an existing prime mover (the infrastructure being moved by the waves) in one pre-existing package. We are essentially optimising our CETO power take-off and controller to suit the application and provide a competitive offering.

“Wave energy has the benefits of consistency and predictability, and in some places, wave may be the only renewable energy that is practical. With an enormous resource that is largely untapped, wave energy is only set to grow, and working on joint initiatives like the MoorPower™ project, will accelerate and strengthen the advancement of these technologies on a global scale.”



Fish feeding barge offshore and exposed to energetic waves

This announcement has been authorised by the Chairman and Company Secretary.

For more information

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APPENDIX

Participants of this industry led project include Carnegie Clean Energy, Blue Economy CRC, Huon Aquaculture, Tassal Group, Advanced Composite Structures Australia (ACS-A), Climate-KIC Australia Ltd, University of Tasmania, University of Queensland, DNV and AMC Search.

MoorPower™ Features

1. Increases autonomy for moored vessels
2. Energy day and night in energetic wave climates
3. Abates carbon emissions that are otherwise difficult to avoid
4. Reduces or removes refuelling requirements, thereby reducing risk of injury and spills
5. Integrated with other energy offshore renewable energy systems including hydrogen and batteries

Link to MoorPower™ [webpage](#)

ABOUT THE BLUE ECONOMY CRC

The Blue Economy CRC brings together expertise in the aquaculture, offshore renewable energy and offshore engineering sectors to deliver innovative solutions that will transform the way we sustainably use our oceans for food and energy production. The Blue Economy CRC is funded in part under the Australian Government's Cooperative Research Centre (CRC) program administered by the Department of Industry, Innovation and Science. The CRC Program supports industry-led collaborations between industry, government, researchers and the community. The Blue Economy CRC brings together 40 partners across 10 nations to conduct collaborative research, development, commercialisation, education and training over a 10-year term. The Blue Economy CRC is headquartered in Launceston, Tasmania.

www.blueeconomycrc.com.au

ABOUT CARNEGIE

Carnegie Clean Energy (ASX: CCE) is a technology developer focused on delivering ocean energy technologies to make the world more sustainable. Carnegie is the owner and developer of the CETO® and MoorPower™ technologies, which capture energy from ocean waves and convert it into electricity. Using the latest advances in artificial intelligence and electric machines, Carnegie can optimally control our technologies and generate electricity in the most efficient way possible. The Wave Predictor technology developed by Carnegie uses a proprietary machine learning algorithm to improve the performance of our wave technologies and has additional applications beyond the wave energy industry. The company has a long history in ocean energy with a track record of world leading developments.

<https://www.carnegiece.com/>