

BOARD OF DIRECTORS & CEO

Non-Executive Chairman
Terry Stinson

Non-Executive Director
Grant Mooney

Non-Executive Director
Michael Fitzpatrick

Non-Executive Director
Anthony Shields

Chief Executive Officer
Jonathan Fievez

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QUARTER HIGHLIGHTS

- Achieved CETO Digital Development Pathway commercial target through cost and performance improvement, signalling escalation of commercial activities
- Delivered a step change reduction in CETO cost of energy and CETO's energy capture is up 30% through innovations
- Released new Product Validation Roadmap for CETO and MoorPower™, alongside complementary product streams, with a clear and accelerated route to commercialisation
- Significant progress made on Phase 1 of the EuropeWave PCP programme, including undertaking tank testing of a CETO model and equipment, and progress on the EuropeWave prototype design
- The advancements of MoorPower™ and CETO, support an expanded addressable market and the ability to unlock opportunities with new and existing partners
- Only the beginning for wave energy as the world, and Europe specifically, reduces its reliance on fossil fuels and demand for renewable energy technology accelerates

Carnegie's CEO, Mr Jonathan Fievez, commented on the Quarter:

"The June Quarter was a period of solid progress for Carnegie with the achievement of a number of product milestones. We are making significant strides towards becoming a leading player in the commercialisation of wave energy technology, and we look forward to showing our progress through our Product Validation Roadmap.

A tight global energy market and accelerated efforts towards decarbonisation are heightening the need for renewable alternatives like wave energy.

Underpinned by our commercialisation strategy and world-class partnerships, we are showcasing that wave energy can become a commercially competitive and widely adopted technology for global markets."

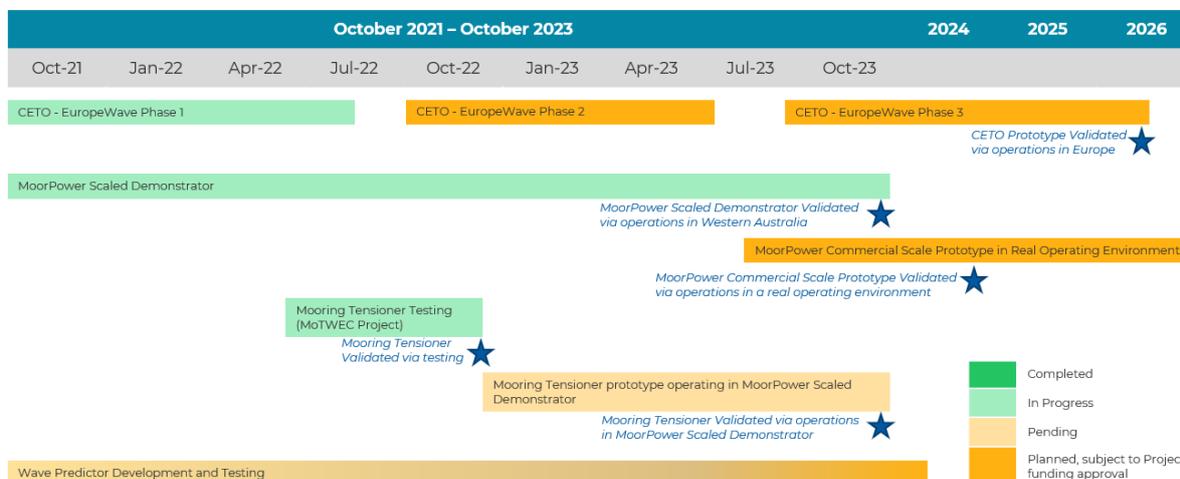
<p>Who is Carnegie?</p>	<p>Carnegie develops ocean energy technologies to make the world more sustainable. The company provides commercially competitive technologies to enable the capture of wave energy to make electricity. Waves are an untapped energy source that is consistent, predictable and globally distributed and can be converted into clean, renewable electricity. The scale of the opportunity is significant, Ocean Energy Europe (OEE) forecasts significant growth for wave energy with a €653b market potential by 2050.</p>
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PRODUCTS

During the Quarter, Carnegie released a new Product Validation Roadmap (“Roadmap”) for the core CETO and MoorPower™ product development, alongside complementary products Wave Predictor and Mooring Tensioner (see [ASX release 29 June 2022](#)).

The latest Roadmap outlines the important next stage in the commercialisation pathway of Carnegie’s products with activities to be progressed over the next 18+ months in order to validate each product stream’s commercial readiness. The Roadmap builds on achievements of the previous Digital Development Pathway and is also fuelled by Carnegie’s strategic partnerships.

The Company remains in a strong financial position to complete the projects underway.



CETO

Cost and performance improvements

During the period, the Digital Development Pathway reached its internal commercial target of reducing CETO’s cost of energy to a level that puts it on the established industry trajectory (see [ASX release 7 June 2022](#)).

The current levelised cost of energy (LCOE) for wave power is estimated by IRENA at USD \$0.30-0.60/kWh.¹ This figure is in line with historical solar PV and wind costs before early commercialisation.

¹ IRENA, ‘Innovation Outlook Ocean Energy Technologies’, 2020 https://www.irena.org/-/media/Files/IRENA/Agency/Publication/2020/Dec/IRENA_Innovation_Outlook_Ocean_Energy_2020.pdf

The work undertaken delivered a step change improvement in the cost and performance of CETO, with the Company expecting to move the CETO technology down the cost curve sooner, making it increasingly attractive to global markets.

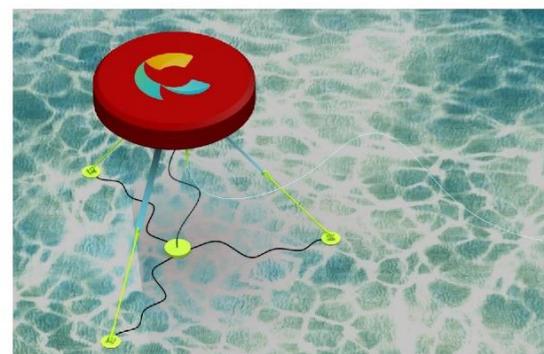
Carnegie was also able to deliver up to a 30% increase in simulated energy capture performance through innovations, including the Company’s proprietary Wave Predictor and Intelligent Controllers.

Achieving these milestones marked the completion of the Digital Development Pathway, which commenced in 2019, and reduces future time and funds required to reach commercialisation. With the Digital Development Pathway complete, the newly released Product Validation Roadmap outlines the next steps in the commercialisation pathway of Carnegie’s suite of products.

EuropeWave Project

The team is making encouraging progress following the selection to the EuropeWave Pre-Commercial Procurement (PCP) programme, a €22.5m EU-funded programme to advance wave energy technologies for commercial exploitation, running from 2021 to 2025.

Carnegie’s wholly owned subsidiary CETO Wave Energy Ireland was 1 of 7 contractors selected for Phase 1, supported by a strong consortium of industry partners. Under the contract, the Company is being paid €291k (A\$463k) to deliver the required Phase 1 activities. This Phase involved undertaking tank testing of a CETO model and equipment; this took place in June at the Cantabria Coastal Ocean Basin in Spain. The project team conducted over 200 tests during the campaign and was very pleased with CETO’s performance in the simulated wave conditions. The tank testing was also independently evaluated to validate CETO’s energy capture efficiency in the European wave conditions.



As part of Phase 1, the project team also advanced the CETO prototype design which, if awarded future phases, would be refined and further detailed during Phase 2 and Phase 3 for deployment at the open-water facilities of the Biscay Marine Energy Platform (BiMEP) in the Basque Country or the European Marine Energy Centre (EMEC) in Scotland in Phase 3.



EuropeWave PCP Phase 1 tank testing at the Cantabria Coastal Ocean Basin in Spain in June

In July, project team members visited BiMEP, a wave energy test site in Spain and one of the two potential EuropeWave deployment sites for Phase 3. The team also visited the nearby port of Bilbao to explore the

port's deployment support capabilities and to visit our partner Saitec Offshore Technologies' DemoSATH floating wind prototype which is being deployed from the port., The team also completed the first CETO concept design review with the EuropeWave Buyers Group in July to demonstrate that it meets the requirements for the European site deployment.



EuropeWave team at Port of Bilbao with DemoSATH (left) and BiMEP Offshore site (right)

CETO Wave Energy Ireland also appointed a highly experienced Project Engineer in July, with a background in ocean energy, to assist with the delivery of CETO Wave Energy Ireland's "ACHIEVE" EuropeWave Project. The project name is derived from 'Advanced CETO for High Impact and Efficiency Validation in Europe'.

Overall, the Company delivered on Phase 1 activities on schedule and have delivered on major key activities as Phase 1 draws to a close.

EuropeWave PCP fully aligns with Carnegie's objectives to pave the way for a commercial roll-out, and as a means to attract future project partners.

MoorPower™

Significant strides were made during the quarter on the \$3.4m MoorPower™ project with the completion of the preliminary design of the scaled demonstrator and the commercial scale prototype of the product. The work on design of the commercial scale demonstrator was done to ensure that the scaled demonstrator prototype meets the requirements and objectives of the Company's commercial scale customers.

The team is now working on the full detailed design of the scaled demonstrator in preparation for manufacturing and assembly. The barge being utilised for the scaled demonstrator has been

purchased and delivered to Carnegie's headquarters and research facility in North Fremantle, where the scaled demonstrator will be deployed.

The MoorPower™ technology is a CETO derived wave energy product designed for moored vessels, offering a solution to the challenge of securing clean and reliable energy for offshore activities and reducing the reliance on diesel generation. The initial target market for MoorPower™ is offshore vessels such as feeding barges for the aquaculture sector.

The project is supported by \$1.35m cash from the Blue Economy Cooperative Research Centre (Blue Economy CRC) and will also be delivered in collaboration with a consortium of partners including two of Australia's largest aquaculture companies, Huon Aquaculture and Tassal Group (Tassal).

Over the 2 years of the project, Carnegie will design, install and operate a scaled demonstrator of the MoorPower™ technology offshore from its headquarters and research facility in North Fremantle, Western Australia. As a result, the major aquaculture industry partners of the project are most likely to become the first adopters of the MoorPower™ commercial product. As an added benefit for Carnegie, lessons learned from the operation of the PTO in MoorPower will feed into CETO activities.



3D design mockup of the MoorPower™ scaled demonstrator on an aquaculture barge

Mooring Tensioner

During the Quarter, Carnegie and project partner Advanced Composite Structures Australia (ACS-A) completed the design, construction and manufacture of the core component of the Mooring Tensioner prototype. Carnegie has also designed and constructed a test rig that is capable of undertaking functional and fatigue testing on the prototype. The Mooring Tensioner test rig is set to be commissioned during the September quarter.

Carnegie's Mooring Tensioner provides passive tension required for rotary electric power take-off systems, such as CETO and MoorPower™. In addition, there is potential for the Mooring Tensioner to be a standalone solution that offers other services such as improving station-keeping for vessels.



Mooring Tensioner Test Rig Construction underway. The Mooring Tensioner Test Rig is being built inside of this container at Carnegie's Research Facility

PARTNERS

Ocean Market Events in Hobart

In May, Carnegie team members visited Tasmania to participate in a series of partner meetings and conferences that provided the opportunity to highlight CETO and MoorPower™ to market and industry representatives.

At the Australian Ocean Energy Market Summit, the team delivered a presentation on what a blue economy and sustainability mean now and, in the future, and promoted how MoorPower™ can accelerate sustainable aquaculture. It is a signature event supporting the market adoption of renewable ocean energy in Australia.

Through the Company's work with the Blue Economy CRC, the team attended its Annual Participants Workshop to deliver presentations and speak on panels about Carnegie's perspective on the sustainable blue economy. Carnegie also visited some of Tassal's feed barges to see firsthand how the technology will be operating in the field through the MoorPower™ project.

The Tasmanian Salmon Symposium offered the opportunity for the team to talk with industry leaders and showcase how Carnegie's novel wave converter system can be used in offshore energy demand applications such as feed barges.



Aquaculture Feed Barge at Tassal in Tasmania in May

Hewlett Packard Enterprise

Carnegie and Hewlett Packard Enterprise (“HPE”) have been collaborating since 2020, and the work conducted by the two companies has delivered significant advancements in the development of technology’s Reinforcement Learning-based controller (Refer to [ASX release 3 June 2022](#)).

As part of the collaboration, HPE exhibited an interactive wave tank display with CETO at the High Performance 2022 Conference in Hamburg. The tank display was also exhibited at HPE Discover 2022, HPE’s landmark global business conference in Las Vegas with thousands of conference attendees. At the conference, Carnegie also featured in a technical break-out session: ‘Carnegie Clean Energy and Hewlett Packard Labs Revolutionizing Wave Power with Trustworthy AI’.



HPE interactive wave tank with CETO on display at HPE Discover 2022 in June

FINANCIAL NOTES

At the end of the Quarter, the Company had approximately \$4.05m in cash reserves. It is noted that careful management of Company funds and assets continues and has meant that significant progress has been made with highly efficient use of capital. The Company remains debt free and in a strong position financially.

Note 6 to Appendix 4C:

Payments to related parties of the entity and their associates were made during the Quarter. In total, approximately \$73k was paid to Directors and associates for salaries, superannuation and contracted services.

This announcement has been authorised by the Chief Executive Officer, Chairman and Company Secretary.

For more information

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About EuropeWave



EuropeWave PCP is an innovative R&D programme for wave energy technology, which runs from 2022 to 2026. It will combine over €22.5m of national, regional and EU funding to drive a competitive Pre-Commercial Procurement (PCP) programme for wave energy.

Match-funded by the EU's Horizon 2020 programme, it is a collaboration between Wave Energy Scotland (WES) and the Basque Energy Agency (EVE). This collaboration is closely aligned with the decarbonisation, industrial and competitiveness objectives of the European Green Deal, and is part of a range of actions being taken to meet the European Commission's targets of 100MW of ocean energy by 2025 and at least 1GW by 2030.

This is part of the EuropeWave project that has received funding from the European Union's Horizon 2020 Research and Innovation Programme under grant agreement No 883751. <https://www.europewave.eu/>