ASX ANNOUNCEMENT
5 November 2024

Carnegie and Hewlett Packard Enterprise extend Collaboration Agreement

Carnegie Clean Energy (ASX: CCE) is pleased to announce a two-year extension of its collaboration agreement with Hewlett Packard Enterprise (HPE), a global leader in information technology. This partnership focuses on advancing Carnegie's CETO wave energy technology by bringing together HPE's expertise in artificial intelligence and high-performance computing with Carnegie's expertise in wave energy control and operations. The companies have been working together since 2020, with HPE's research group, Hewlett Packard Labs, playing a key role. The agreement between Carnegie and HPE is for an additional two years, to 15 November 2026. All other terms and conditions of the agreement remain in effect.

Carnegie's CETO device featured at HPE Discover conference 2024, Image credit: Wall Street Journal.

Since 2020 Carnegie and HPE's research group, Hewlett Packard Labs, have worked together to develop a Reinforcement Learning (RL) based controller for CETO. This innovative controller enables CETO to self-learn and optimise its energy extraction from ocean waves, leading to improved performance and cost-effectiveness. Reinforcement learning is an area of artificial intelligence in which a machine learning model is built with the ability to self-learn. The RL controller can directly learn and apply the optimum response to predicted waves during operation. For more detail on Carnegie's collaboration with HPE and supercomputing: https://www.carnegiece.com/reinforcement-learning-controller/

In 2023, the team successfully tested and validated the CETO RL controller during a tank testing campaign at the Cantabria Coastal and Ocean Basin. The validation gave both parties confidence to continue the collaboration and work towards the next key milestone, testing the RL controller in an operating CETO unit deployed in an open ocean environment.

This will be delivered during the ACHIEVE Programme, which will see a CETO prototype deployed and operated at the Basque Marine Energy Platform (BiMEP) in Spain in 2025. This programme, supported by EuropeWave, the Spanish Government and the Basque Energy Agency (Ente Vasco de la Energia), is a crucial step in demonstrating CETO's capabilities in a real-world environment.

This collaboration leverages HPE's AI expertise to enhance Carnegie's wave energy technology and accelerate the CETO's commercialisation pathway.

During 2024, Carnegie was featured at the HPE Discover Conference in Las Vegas, where HPE CEO Antonio Neri highlighted the collaboration between the companies during his keynote presentation. The exhibition accompanying the event hosted the HPE purpose-built CETO wave tank, providing attendees an opportunity to engage with the technology. By request, Carnegie CEO Jonathan Fievez presented at the Discover Conference, providing firsthand insights to delegates.

Carnegie CEO Jonathan Fievez demonstrating the custom CETO wave tank at HPE's Discover 2024 conference in Las Vegas

Carnegie's CEO, Mr Jonathan Fiévez, commented: *"The collaboration with HPE has been extremely rewarding with teams from both sides learning a lot. The work together has so far delivered a great outcome; however, it only scratches the surface in terms of what is possible from AI. With open ocean deployment occurring in the near future, it will be very exciting to see it in action and probably learning things about waves we didn't expect!"*

This announcement has been authorised by the Chairman and CEO.

For more information

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ABOUT CARNEGIE AND ITS SUBSIDIARIES

Carnegie Clean Energy (ASX: CCE) is a technology developer focused on delivering ocean energy technologies to make the world more sustainable. Carnegie Technologies Spain and CETO Wave Energy Ireland is a wholly owned subsidiary of Carnegie Clean Energy. 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 optimally controls our technologies and generates electricity in the most efficient way possible. The company has a long history in ocean energy with a track record of world leading developments. https://www.carnegiece.com

ABOUT ACHIEVE PROGRAMME

The ACHIEVE Programme is an initiative being delivered by Carnegie's subsidiaries CETO Wave Energy Ireland under contract by EuropeWave Buyers Group (ACHIEVE Project) and Carnegie Technologies Spain with the support of funding awarded by the Spanish Government through the RENMARINAS Demos Programme (AGUAMARINA Project) and the Basque Government through a grant from the Ente Vasco de la Energia (ACHIEVE+ Project).

Through this collaborative initiative, Carnegie will deploy and operate a CETO prototype at the Basque Marine Energy Platform (BiMEP) in the Basque Country, Spain, commencing in 2025, marking a key step on CETO's commercialisation pathway. The CETO Unit will operate for 2 years in this open ocean site and the data collected will be used to validate the performance of the CETO technology and propel it along the commercialisation pathway.

ABOUT EUROPEWAVE

EUROPEWAVE

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

Originally pioneered by the Wave Energy Scotland programme, the PCP model provides a structured approach, fostering greater openness, collaboration and sharing of risk between the public sector and technology developers. The programme will focus on the design, development, and demonstration of cost-effective wave energy converter (WEC) systems for electrical power production that can survive in the harsh ocean environment.

Match-funded by the EU's Horizon 2020 programme, EuropeWave is a collaboration between Wave Energy Scotland (WES), the Basque Energy Agency (EVE) and Ocean Energy Europe (OEE). 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 2027 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/

ABOUT RENMARINAS DEMOS

The RENMARINAS DEMOS Programme was established by Spain's Ministerio para la Transición Ecológica y el Reto Demográfico (Ministry for Ecological Transition and the Demographic Challenge) to grant aid for investment in pilot projects, test platforms and port infrastructure for marine renewables. This was established within the framework of the European Union-funded Recovery, Transformation and Resilience Plan, Next Generation EU. The programme provides aid in the form of a non-refundable grant managed by IDAE, Instituto para la Diversificación y Ahorro de la Energía (Institute for Diversifcation and Energy Saving).

RENOVABLES MARINAS DEMOSTRADORES

Financiado por la Unión Europea NextGenerationEU

MINISTERIO PARA LA TRANSICIÓN ECOLÓGICA Y EL RETO DEMOGRÁFICO

IDAE Instituto para la Diversificación y Ahorro de la Energía

ABOUT ENTE VASCO DE LA ENERGIA (EVE)

The Ente Vasco de la Energía (EVE) is the Basque Country's energy agency, a public body established by the Basque Government. EVE serves as a central force in the region's energy sector, with a focus on the promotion of energy efficiency, the expansion of renewable energy sources, the development of sustainable energy policy, and the advancement of innovative energy technologies. The funding has been provided through the Grants programme for investment in the demonstration and validation of emerging marine renewable energy technologies 2023 to further support the ACHIEVE Programme.