

Wave Energy Litmus Test

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A STUDY that now has funding to be completed will confirm that the Bombora Wave Energy Converter will make an important contribution in diversifying the electrical energy supply space.



Testing Bombora WEC at the Australian Maritime College.

It will also seek to confirm whether the system can supply a new commercially viable source of renewable energy.

The Australian Renewable Energy Agency announced earlier this month it would provide \$181,000 in funding to support Bombora Wave Power in the completion of its detailed Levelised Cost of Energy study for the project.

Bombora Wave Power director Shawn Ryan told *Energy News* sister publication WME he was grateful to ARENA for their support, which he viewed as an extremely important case of third party corroboration for the work that the company was doing.

“We’re looking to benchmark our technology against other renewable energy sources and the way we do that is by confirming our levelised cost of electricity,” Ryan said.

“The public will be able to see that wave energy is a viable technology when compared to solar and wind.

“In terms of public knowledge, that’s really one of the aims of the ARENA program - to disseminate information and share knowledge, in relation to what is available in the market place and how the different renewable systems perform.

“It’s a highly intensive capital development program that we’ve got, and we need validation that we’re on the right pathway to seek and achieve that investment that we require.”

The project will focus on the current design for a commercial scale Bombora WEC, a 1.5MW device comprising two 60m arms resting on the sea floor at a depth of 10 meters.

“So it is a very simple system. It uses a membrane to take water pressure from the waves and transfer that to air pressure,” Ryan said.

“The pocket of air inside the membrane then gets pushed around an air circuit and that flow drives an air turbine.”

Electricity from the device will be transferred to shore via a subsea cable for supply into the electrical grid.

The device aims to address the two biggest issues the wave energy space is facing – costs of energy and ocean wave survivability – which sets Bombora apart from other projects.

“In terms of survivability we’re in a much lower extreme wave scenario than everyone else as we are in the near shore,” Ryan said.

“The other beauty of our structure is that it sits on the sea floor, so it’s unlikely that it’s going to float off and become dangerous if a mooring line snaps.

“In addition, we have a number of different features relative to other systems in marine energy – that will mean that we’re well down the right pathway, in terms of the cost of energy.

“We’ve already had our pre-feasibility study independently reviewed by Oxford Oceanics, Black & Veatch, and AirgasCo.

“Now we’re going through the process to cap stone a body of work and research that we’ve done and gaining confidence and cost accuracies that correspond with our future investment requirements.”

Currently, wave power is less commercially mature than other more conventional sources of renewable energy such as wind and solar.

While there are a number of solutions under development, there are no commercially proven wave energy technologies in the world.

“The environment they operate in is challenging, large forces are involved and the success in the history of global wave energy convertors was heavily dominated in the 70s. Once European countries started to go nuclear in the 80s and oil prices stabilised, the impetus to develop fell away,” Ryan said.

“Today, since the policy, regulatory framework and public opinion have shifted back towards supporting renewable energy in most countries, wave energy is coming back into the mix, but unfortunately, the difficulties in dealing with the environmental forces have not been overcome as yet.

“It would be very fortuitous for Australia to have a program that is actually tailored for marine energy within ARENA or the CEFC. That would certainly add a level of impetus to the sector.

“So that’s really where our study is coming from – to prove that we have a pathway to commercial viability, with external consultants and academics guiding our knowledge base so that we can actually turn around to ARENA, the government, and the public and say, ‘we have a viable technology and we should be supported going forward to get this technology from the lab to reality’.”

The cost of electricity study will clarify the economics of Bombora’s WEC technology to inform the development of a proposed full-scale trial of the device.

The study is due for completion in March 2016.