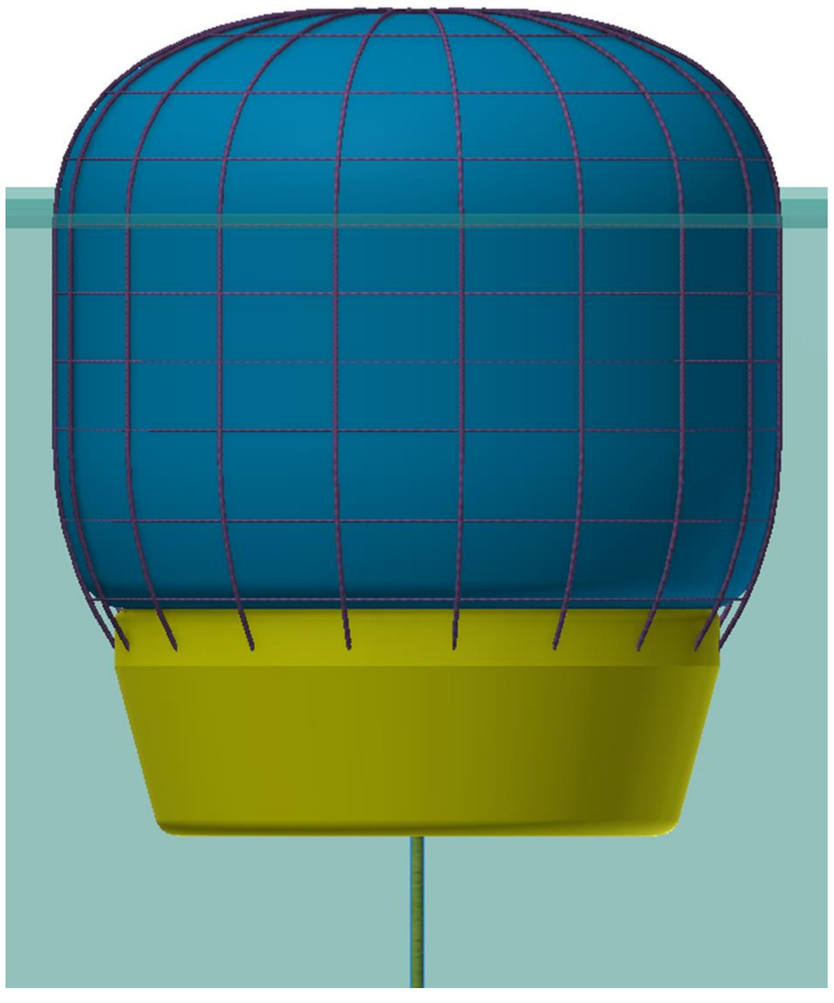
NetBuoy Stage 2
Structural Materials & Manufacturing Processes



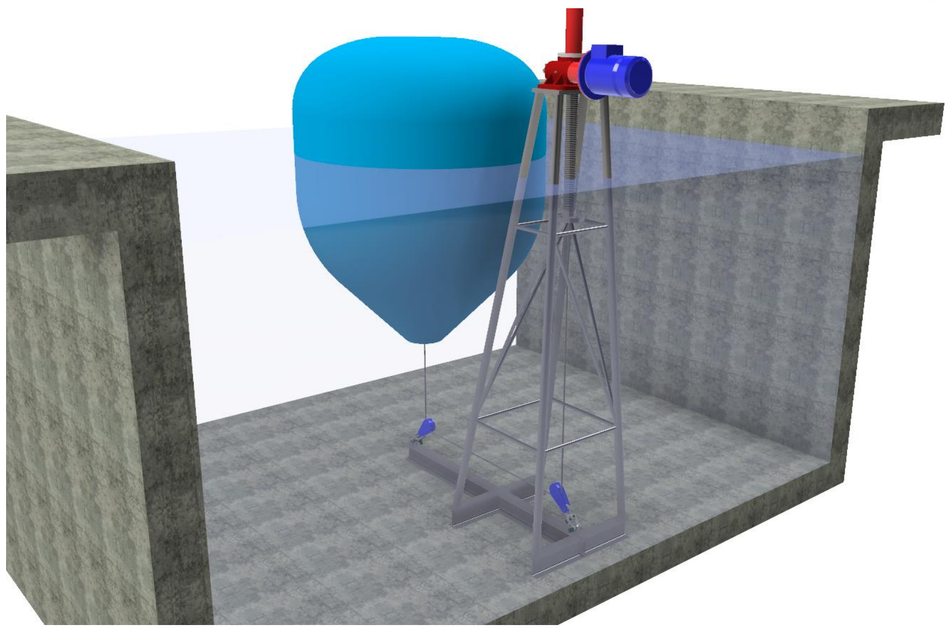
Full-scale design showing machine integrated room option

The Concept:

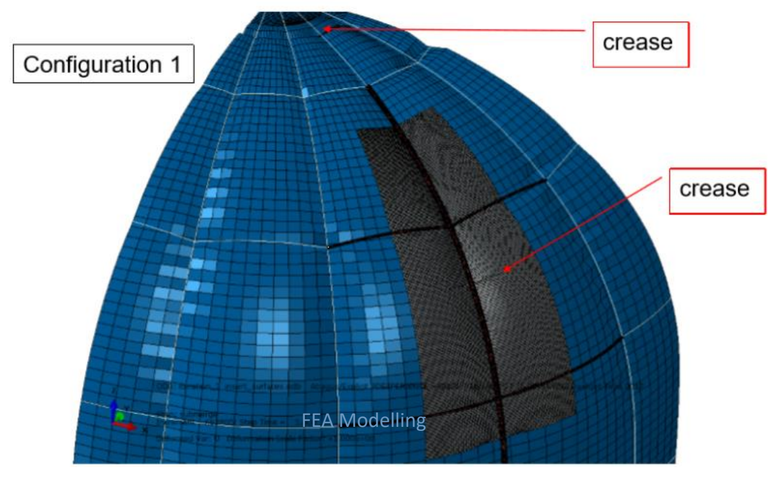
The NetBuoy concept aims to significantly reduce the construction and installation cost of wave energy converter prime movers. A pressurised reinforced elastomer buoy is restrained within a rope net. The net provides the load-path between compliant buoy and PTO or structure. The inflatable technology provides favourable load shedding and survivability characteristics. The system as a whole can be inflated at the deployment site, significantly reducing the space requirement for transportation from point of manufacture. Partial inflation at point of hook-up means any pull down loads can be reduced. For these reasons lower cost vessels can be used and towing to site minimised. The NetBuoy concept has been developed around a heaving point absorber which can be attached to linear power take off and tether to the seabed using anchor, however, Stage 1 assessment has shown this technology to be applicable to many WEC types.

The Project:

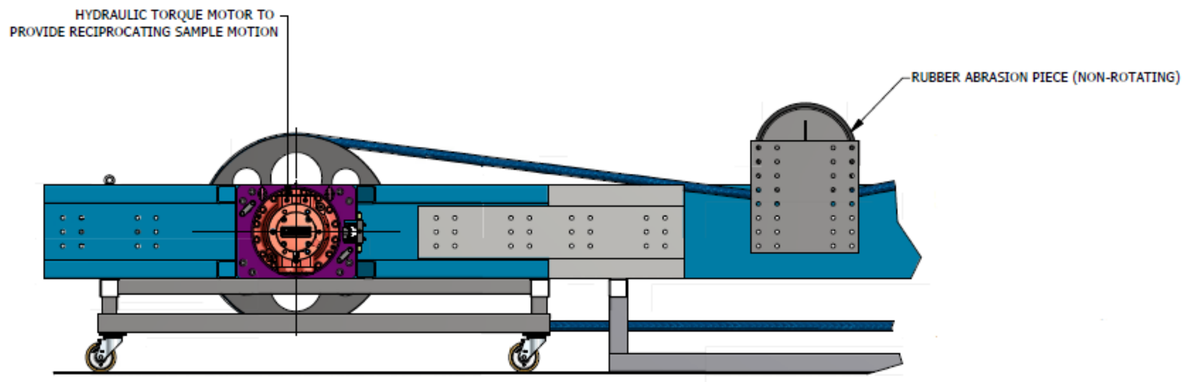
Stage1 demonstrated the cost-benefit and technical viability of the NetBuoy compared to steel based equivalent buoys. A comprehensive landscaping and design engineering study was conducted. Manufacturability and ease of installability was used to inform the **Stage 1** economic model. A key aim of **Stage 2** is to deliver the qualification tests and mitigate technology risk via a systems engineering approach as outlined in **Stage 1**. TTI continue to adhere to DNVGL-RP-A203 recommended practice for the qualification of novel technology. **Stage 2** of the project involves scaled full-system manufacture and wet testing together with full-scale sub-system and component testing. Data acquired from these tests will be used to correlate and update numerical and FEA models developed under Stage 1. Design tools, manufacturing and installation know-how will then be used to optimise the design and revisit the levelised cost of energy and commercialisation. Examples of qualification tests and modelling to be conducted under **Stage 2** are presented below.



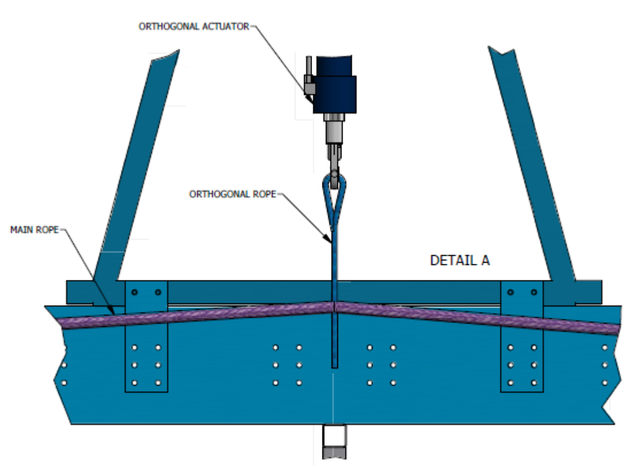
Full system wet test at nominal 1/3 scale – measure shape change and net loads



FEA & Orcaflex models to be correlated with physical tests



Full-scale component testing – rope on buoy abrasion



Full-scale sub-system testing – net jointing

If you are a WEC developer or supplier who has interest in the potential of this technology, please contact Ben Yeats or Tom Mackay via email below.

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