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REYGAR LTD  
ENGINEERING SYSTEMS 



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# Renewable Energy: Dynamically Positioned Barge Set to Revolutionise the Tidal Energy Installation Challenge

*Installing tidal energy devices is both costly and technically challenging, but a new Dynamic Positioning (DP) flat-top barge could be the answer that the industry has been waiting for. Adding DP capability to a versatile flat-top barge offers a real cost effective tidal energy installation solution with multiple benefits.*

Successfully installing devices in locations with the best resources poses a significant trial for the tidal energy sector. So far, single turbine installations have been carried out by offshore spec DP vessels sourced from the oil and gas sector. These vessels and their DP systems are not designed for operation in the high energy commercial sites where these devices will be deployed. They also typically have day rates in excess of £100,000, significantly increasing the financial price-tag of a tidal energy installation.

A new project has been supported by the Technology Strategy Board to provide a lower cost, optimised installation vessel for tidal energy array installations.

The Technology Strategy Board, the UK's government-backed innovation agency, awarded a grant of £1.5m to the DP Barge project consortium in November 2012. The grant is for the consortium to design, develop and commission a barge with DP capabilities optimised for high energy locations providing a lower cost alternative for tidal array installations.

The method known as 'Dynamic Positioning' enables a vessel to autonomously maintain its position and heading by using its own thrusters. The DP Barge project will equip a flat-top barge with a dynamic positioning system designed specifically for operation in high tidal flow. .

The DP Barge project consortium is made up of 4 companies all committed to innovating technical solutions for the tidal energy sector. They are IT Power (project lead), Keynvor MorLift Ltd (marine contractor and ship owner), Reygar Ltd (DP controller developer) and A&P Falmouth (shipbuilders).

The barge will have significant deck space and heavy lift capacity to enable multiple operations to be conducted from a single platform, allowing installation of a wide variety of tidal energy devices with their associated sub-systems and drilling equipment.

A key objective of the project is to maximise the operational window of the vessel in energetic tidal sites through the use of an optimised DP control strategy and propulsion system.

The project consortium partners bring together an abundance of marine energy and maritime operations expertise, and a true indication of the level of commitment to this exciting and emerging sector. Between them they have managed several marine energy installation and design projects and are well equipped to understand the obstacles facing the sector.

The vessel will be designed to be operated by a smaller crew than generally required for a large heavy-lift vessel. The vessel's suitability for a wide variety of tidal turbines means that developers won't need to directly invest significant sums in the construction of a bespoke vessel, whilst offering high positional accuracy.

As part of the evolution of the project, details will be disclosed throughout its lifecycle, but should you wish to find further information, refer to the project lead, IT Power at [www.itpower.co.uk/marine](http://www.itpower.co.uk/marine)

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#### **NOTES TO EDITORS:**

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#### **BACKGROUND INFORMATION:**

- In March 2012 the Technology Strategy Board, the UK's government-backed innovation agency, invited companies to develop innovative projects to support marine energy array technologies. <http://www.innovateuk.org>
- According to figures published in the Accelerating Marine Energy report by the Carbon Trust in 2011, installation costs can account for a third of the levelised cost of energy [LCOE] of a tidal energy project. [www.carbontrust.com](http://www.carbontrust.com)
- Often the best tidal energy resources, such as those in the Pentland Firth, are situated in remote locations with harsh maritime conditions and strong, non-linear tidal flows. Combined with deep water and a slack tide lasting less than 20 minutes, these conditions are technically challenging to operate in.
- Jack-up barges and moored heavy-lift vessels have also been used to install single tidal units. However, current construction jack-up barges aren't intended for use in deeper water, high velocity flows and are being operated at the limits of their capabilities; the mooring systems associated with most moored heavy-lift vessels means they are time consuming and have limited suitability for installation of large arrays.

#### **CONSORTIUM GROUP MEMBERS:**

**IT Power Ltd.** is a leading engineering design consultancy with an unprecedented history developing marine energy technologies since 1992. IT Power project managed the installations of several large scale marine energy devices, including the world's first tidal stream turbine – Seaflow – in 2003. In addition, IT Power conducts large scale ocean energy resource assessments, market and technical analyses, feasibility studies and detailed mechanical, electrical and array modelling. The Offshore team has delivered over 60 marine energy projects as technical consultants to a variety of international clients including governments, technology developers, project developers and supply chain manufacturers. The company was founded in 1981, and has since grown to become the IT Power Group of Companies with offices in Australia, China, India, Kenya and Argentina, providing specialist technical consulting services in all aspects of sustainable energy and climate change.

[www.itpower.co.uk](http://www.itpower.co.uk)

**Keynvor MorLift Ltd** is a UK-based marine contracting firm specializing in shoreline and coastal marine operations. The company owns and operates a range of marine and land-based assets. With a history of successful marine operations and engineering capabilities in renewables and coastal civil engineering projects, Keynvor MorLift has built a reputation for delivering a first class service to its clients. KML offers a flexible approach to project execution, and prides itself on an ability to deliver on time and within budget. Services provided range from support for early FEED engineering through to full site decommissioning. Keynvor MorLift Ltd. installed Tidal Generation Limited's 500kW device in 2009 as well as their recent 1MW device and whose personnel were also involved in the installation of MCT's SeaFlow turbine off Lynmouth in 2003 and their SeaGen turbine in 2008.

[www.keynvormorlift.co.uk](http://www.keynvormorlift.co.uk)

**A&P Falmouth**, part of A&P Group is strategically located for customers operating in North West Europe. A&P Falmouth offers extensive ship-repair facilities with 3 dry docks, vast quay space, craneage and workshops, providing high quality and guaranteed turnaround times that encourage customers to return time after time. A&P also operates main port facilities in the Port of Falmouth with nearly a kilometre of wharf-age for cargo, cruise ships and visiting ships as well as alongside repair. A&P Falmouth is a leading force in the renewable energy sector already working with both local and international partners to develop wave and tidal energy in Cornwall and the UK. A&P Falmouth is the closest port to the recently opened FaBTest site and the closest major port to Wave Hub. It is also the largest engineering, steel fabrication and painting and blasting company in Cornwall with over 9,000m<sup>2</sup> of workshop facilities, 9 major cranes with combine lift of 300t and a wide range of specialist skills and services in house. By applying their shipbuilding expertise to the DP Barge project, A&P Falmouth will impart their knowledge of quayside operations and vessel conversion.

[www.ap-group.co.uk](http://www.ap-group.co.uk)

**Reygar Ltd** is a small British engineering company developing specialist electrical and mechanical products for the tidal stream industry, as well as offering marine renewables consultancy services. The engineering team have first-hand experience working with two of the leading tidal device developers between 2001 until 2010. Reygar's products are designed to meet the key challenges of marine installation and maintenance in this highly energetic and challenging tidal environment. The company has developed a low cost Dynamic Positioning for use on small workboats working in the marine renewables sector.

[www.reygar.co.uk](http://www.reygar.co.uk)

#### **GRANT AWARDED BY:**

The **Technology Strategy Board** is the UK's innovation agency. Its goal is to accelerate economic growth by stimulating and supporting business-led innovation. Sponsored by the Department for Business, Innovation and Skills (BIS), the Technology Strategy Board brings together business, research and the public sector, supporting and accelerating the development of innovative products and services to meet market needs, tackle major societal challenges and help build the future economy. For more information please visit

[www.innovateuk.org](http://www.innovateuk.org)