

Harnessing the power of our tides

Swansea Bay Tidal Lagoon will be the world's first tidal lagoon power plant.

A tidal lagoon is a 'U' shaped breakwater, built out from the coast which has a bank of hydro turbines in it. Water fills up and empties the man-made lagoon as the tides rise and fall. We generate electricity on both the incoming and outgoing tides, four times a day, every day.

Due to the incredible tides on the West Coast of Britain, by keeping the turbine gates shut for just three hours, there is already a 4m height difference in water between the inside and the outside of the lagoon. Power is then generated as the water rushes through 60m long draft tubes, rotating the 7.2m diameter hydro turbines.

The project was awarded a Development Consent Order in 2015 and is primed for construction. It will comprise 16 hydro turbines, a 9.5km breakwater wall, generating electricity for 155,000 homes for the next 120 years. Its major delivery partners include Atkins, General Electric, Andritz Hydro, Laing O'Rourke and Alun Griffiths Ltd.



The 320MW pathfinder project provides a scalable blueprint for our programme, opening up the option of a fleet of larger UK tidal lagoons to generate renewable electricity at a scale and low cost not seen before.

To date, approximately £35 million has been spent on project development. With the exception of a commercial loan from Welsh Government this has been financed privately.

Our aim is to start on site in 2018. Construction of the entire project will take four years, with first power generated in year three.

British institutions, led by Prudential's InfraCapital and InfraRed Capital Partners, will provide equity funding for the business. Macquarie Capital (Europe) Limited is advising Tidal Lagoon Swansea Bay (TLSB) on debt

funding, and has received close to 40 expressions of interest to provide debt finance to the project.

The majority of project's £1.3 billion capital spend will be on content sourced in Wales and across the UK.

Independent reports find that 2,232 construction and manufacturing jobs will be directly sustained by the build, supporting thousands of further jobs in the wider Welsh/UK economy. The project is expected to contribute £316 million in Gross Value Added to the Welsh economy during construction, followed by £76 million in each of its 120 years of operation.

The independent Tidal Lagoon Industry Advisory Group has, since 2014, worked to ensure that Welsh and UK industry is ready to secure a primary position in the tidal lagoon sector.

British-made turbine and generator technology and engineering expertise will be at the heart of the project, seeding a new global industry with significant export potential for UK manufacturers. The project will facilitate the creation of two new manufacturing facilities to be built in Wales, one for machining and pre-assembly of turbines and one for heavy fabrication of steel components.

Swansea Bay Tidal Lagoon requires only the rate of bill payer support currently offered to nuclear, a 60 year established industry. But because the project is small, its overall cost to households is also small: potentially as low as 20-30 pence per household per year, on average.

Economies of scale apply: large-scale lagoons generate cheaper power than small-scale lagoons. The larger projects being prepared to follow the pathfinder at Swansea Bay could generate [the cheapest electricity of all new power stations in the UK](#).

Research carried out by ComRes in May 2016 found that 84% of Conservative councillors and 83% of Conservative MPs are in favour of the project, which featured in the Conservative Party 2015 General Election manifesto.

Swansea Bay Tidal Lagoon is already world famous. The project has been presented to audiences across the globe, including to European Union energy ministers and at COP21, the 2015 Paris Climate Conference. International TV crews and press reporters have been regular visitors to Swansea Bay.



**Feature animation: artist impression of a tidal lagoon*