

Mersey Tidal Power

• Tidal Power

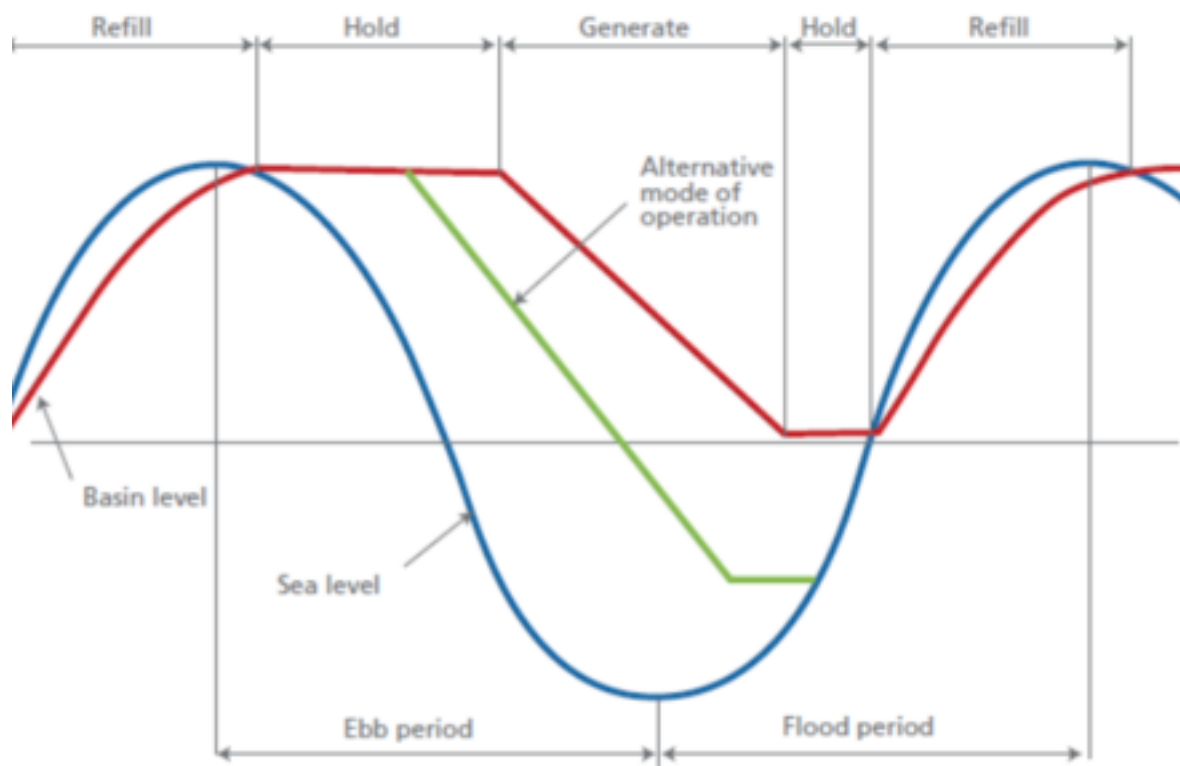
Tidal Resource

Other Tidal Schemes

Tidal Barrage

A barrage creates a water level difference between an impounded basin and the open sea as the tide rises or falls. Electricity can be generated by conventional horizontal-axis turbines, which are available from several manufacturers and widely used in hydroelectric power applications. Various operating strategies are possible. These include generation on the ebb tidal flow alone (possibly with pumping to increase the generating head) or on the ebb and the flood tides.

Tidal barrage schemes have been pursued in several parts of the world, most notably in the Rance Estuary in France and the Shiwa Estuary in South Korea.



Tidal Fence

Tidal fences typically comprise a bank of energy conversion devices housed in a continuous structure. This could be a complete barrier across an estuary or a partial barrier to allow access to shipping; it might also be a pier extending from one bank. Crucially, a small head difference is created as a result of the constricted flow through the fence, which, in turn, raises the velocity of the water passing through the generating device. This then opens up the possibility of using devices developed for open-stream use within the fence configuration.

Horizontal and vertical axis turbines

Both horizontal and vertical axis open-stream turbines could be suitable for use in a tidal fence. Several devices of these two kinds are being developed and tested around the world, but none have reached commercial scale production.

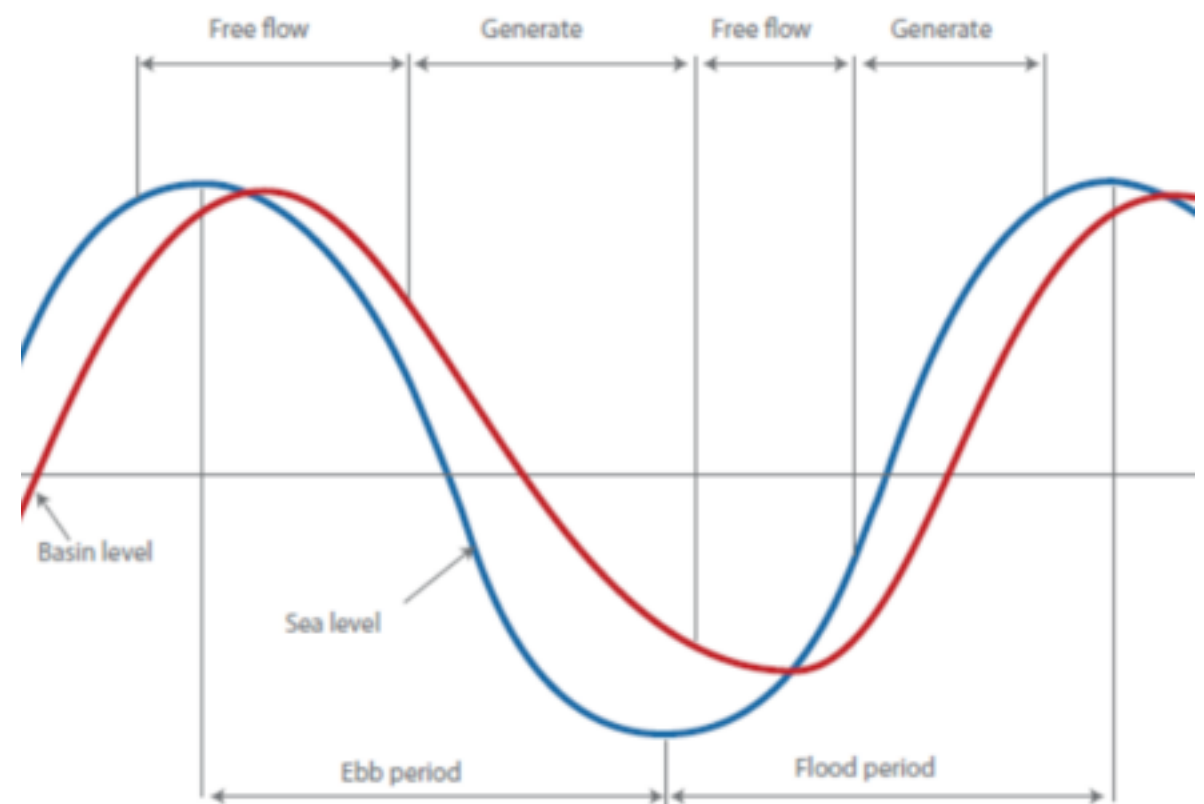
The Spectral Marine Energy Converter (SMEC)

The SMEC is being developed by a UK company called VerdErg, which was established in 1979. The device concentrates the energy contained in a large body of slow-flowing water into a smaller body of fast flowing water using the Venturi effect.

For more information visit [the VerdErg website](#).

Waterwheels

Waterwheels have been used for centuries to generate power. Their design has often been empirical, however, and there are no engineering standards or guidelines for large-scale devices.



Tidal Lagoon

A tidal lagoon works in the same way as a tidal barrage, except that a perimeter embankment is employed to impound the water. Lagoons can thus be sited completely offshore or connected to the land. Electricity is generated by the same kind of turbines as used in a barrage scheme.

The main advantage of a lagoon is that it avoids creating a barrier completely across the estuary and so the impacts on shipping, water quality and the local ecology are potentially less substantial.

Although no tidal lagoons operate anywhere in the world, they are being considered for the Severn project and in Swansea Bay, and they are also being evaluated for the Mareol project in France.

Tidal Stream Arrays

Tidal-stream arrays generate electricity by capturing some of the kinetic energy of the tides: they rely on the speed of the water passing through an array of devices. They are designed to be installed in open water without an impounding structure of any kind.

Although there is only one in commercial operation, there are dozens of devices at various stages of development between concept and testing. This was installed by Marine Current Turbines (MST) in 2008 at Strangford Lough, Northern Ireland, and comprises of two 600 kW SeaGen® units.

A brief overview on the different type of technologies available is highlighted within the [Stage 1 Options Report](#).

