

## Tidal energy from the Severn estuary, UK

**Authors:**

[Chris Binnie](#), MA, DIC, HonDEng, FREng, FICE, FCIWEM

[Author Affiliations](#)

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Abstract

The Severn estuary in Britain has the second highest tidal range in the world. However, the estuary and much of the adjoining Bristol Channel are too shallow for current commercial tidal stream arrays of the horizontal-axis type. The most successful tidal range scheme is the La Rance scheme in Brittany, France, which has operated for 45 years and produces the cheapest electricity in Europe. Tidal range schemes in the Severn estuary have been studied several times. The Department of Energy and Climate Change study in 2008–2010 showed a Cardiff/Weston ebb-only barrage (15.6 TWh/year) and the Bridgwater Bay ebb/flood lagoon (6.2 TWh/year) to be feasible, but with appreciable environmental issues. More detailed environmental and planning studies would be needed to demonstrate compliance with the EU Habitats Directive. Several smaller lagoon schemes have also been proposed and the Swansea Bay scheme is 0.4 TWh/year currently seeking planning permission. Thus, the total energy output from tidal range in the Severn could be about 25 TWh/year, about 7% of the UK energy needs. The energy available would be predictable and, if aligned with tidal lagoons on the North Wales coast and elsewhere, continuous, although varying with the spring and neap tidal cycles.

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