

THE  
“DAWSON PLAN”  
FOR  
SUSTAINABLE, CONTINUOUS TIDAL  
POWER GENERATION

**Dawson Construction Plant Ltd**

Chesney Wold, Bleak Hall, Milton Keynes MK6 1NE, ENGLAND

Tel: (44) 1908 240300 Fax: (44) 1908 240222

E-Mail: [robind@dcpuk.com](mailto:robind@dcpuk.com) Website: [www.dcpuk.com](http://www.dcpuk.com)

**Contacts:**

Robin Dawson  
Dave Brown

## SEVERN BARRAGE

### CONTINUOUS POWER

***Continuous electrical power can be generated, 24 hours per day, 365 days per year, regardless of tide level, using the huge tidal range which occurs in the River Severn Estuary between England and Wales.***

Previous barrage proposals have sought to generate power on the ebb tide only or on both the ebb and flow. Even generating on both ebb and flow there are dead spots when no power can be generated. This proposal identifies a new method by which storage can be built into the system enabling power to be generated continuously throughout the tidal range, 24 hours a day.

Quite apart from the massive power that could be generated the project creates huge Environmental benefits.

A barrage incorporating sluice gates would be built north/south across the Severn Estuary from approximately Hurtstone Point on the north coast of Devon to Nash Point on the south coast of Wales. A second barrier would also be constructed running east/west from the centre of the sluice barrage to Brean Down near Weston Super-Mare. This combination of barrages would divide the Severn Estuary into two. The northern half, which we will refer to as The Estuary, would become a maintained high water level. The southern half, which we will refer to as The Basin, would become a maintained low level. A power generation plant built into the dividing barrier would generate electricity 24 hours per day by discharging water from the high level estuary into the low level basin. As the estuary empties through the power station it is refilled twice every 23 hours by the high tide. As the basin fills up with water from the power station tail race it is emptied twice every 23 hours on the outgoing tide. Variations in power demand could be accommodated by bringing more generators on stream. Variations in power available from Spring to Neap tides could be anticipated and alternative sources of power increased or decreased as necessary. Being tidal power it is reliable and predictable for thousands of years to come, unlike wind or wave power, which depends on the weather.

#### **Carbon Free, Fixed Price**

The vast amount of power generated from the tides would produce no carbon. Electricity produced would be fixed price for an indefinite period as there would be no escalating fuel cost in future years. We estimate a potential supply of 3,500 MW delivered 24 hours per day assuming turbines with 60% efficiency.

### **Political Interference**

This power facility would be entirely under British jurisdiction and therefore not vulnerable to political instability in other countries.

### **Shipping**

Lock gates would be incorporated in the northern barrage to facilitate access for shipping to the many Severn Estuary ports.

### **Road/Rail Crossing**

The construction of the Barrage could incorporate a road crossing from Wales to Devon. A rail crossing could also be incorporated at little additional cost.

### **Environmental and Commercial Benefits**

1. The Severn Estuary, instead of having a tidal range of approximately eleven metres from +5 to -6, would have a maintained range from +5 down to +2. This means that all of the ports of Barry, Cardiff, Newport, Avonmouth and Bristol would have 8 metres more water depth at the lowest tide. They would be much more practical ports to operate at this higher level. The Estuary would become the largest sheltered water harbour in the world.
2. The Basin, on the North Devon coast which has minimal commercial use, (after the closure of Hinkley B Power Station) would have a tidal range from zero to -6. This would leave large areas of foreshore for nature reserves. Flooding in the River Parrett would not occur due to the lower water level in the Basin.
3. Water velocities in the estuary and basin would be considerably reduced. As a result sediments would settle out and water clarity would improve significantly. Fish life would increase and bird life would increase as a direct result. The basin would also become a relatively sheltered water for recreational use and wild life would flourish. Salmon ladders could be incorporated in both Barrages.
4. By locking the sluices of the Northern barrage, thereby limiting the height of spring tide in the Estuary the barrage would act as a flood defence. If at the same time there was a risk of flooding from abnormal rainfall in the upper reaches of the Severn Estuary/River Avon, flood waters could be drained off into the basin through the power station. Such a flood relief facility does not exist without the basin and power station.
5. Road and Rail communication between South Wales, Devon and Cornwall would make a substantial contribution to the commercial prospects of the region. The Barrage itself would become a significant tourist attraction.

## **Severn Bore**

For those who enjoy the phenomenon of the Severn Bore for surfing all is not lost. It is quite practical to construct an underwater structure which could be hydraulically driven to create an appropriate "Tsunami" on which to surf the upper reaches of the estuary. Being man made it can be regulated to occur at the time of day when it would have normally occurred or it could be at a convenient predetermined time to suit surfers.

## **Construction**

In order to minimise the environmental impact of quarrying materials for the barrage and the barrier it is envisaged that both structures would be built in pre-cast concrete. These could be built in many locations, and floated into position in much the same way as Mulberry harbours were built and floated across to Normandy over 60 years ago. This would share the work, together with its environmental implications, over a wide area thereby avoiding freak conditions in any one place. It would be a very "European" project. Rock armouring would be required to protect the concrete structures, add stability and provide an environment for the propagation of fish. Locks could also be pre-cast and assembled off site and floated in. Turbine generators could be built off-site and incorporated in pre-cast concrete caissons to be floated into position.

This form of construction, proved during World War II, and further developed for North Sea Oil gravity platforms, would enable construction to be carried out simultaneously in many locations off site. Assembly on site could also take place in multiple locations bringing the construction period to a minimum. The finished facility would, by geographical necessity, be Anglo-Welsh but the construction could involve many European countries, particularly those with a coastline, from Portugal to Finland.

In view of the vast quantities of "Green Power" that would be produced this project should be regarded as an issue of global importance, not just a national or parochial option.

Robin Dawson  
November 2006

**COST-V- BENEFIT**

**Cost**

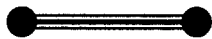
1. Capital cost of Barrage construction, Power Generators and distribution network into the existing Grid.
2. Finance of Capital and work in progress.
3. Maintenance.
  
- A. Environmental cost of cement production, aggregate extraction and steel production.
- B. Environmental cost of construction sites ( potentially from Portugal to Finland )

**Benefit**

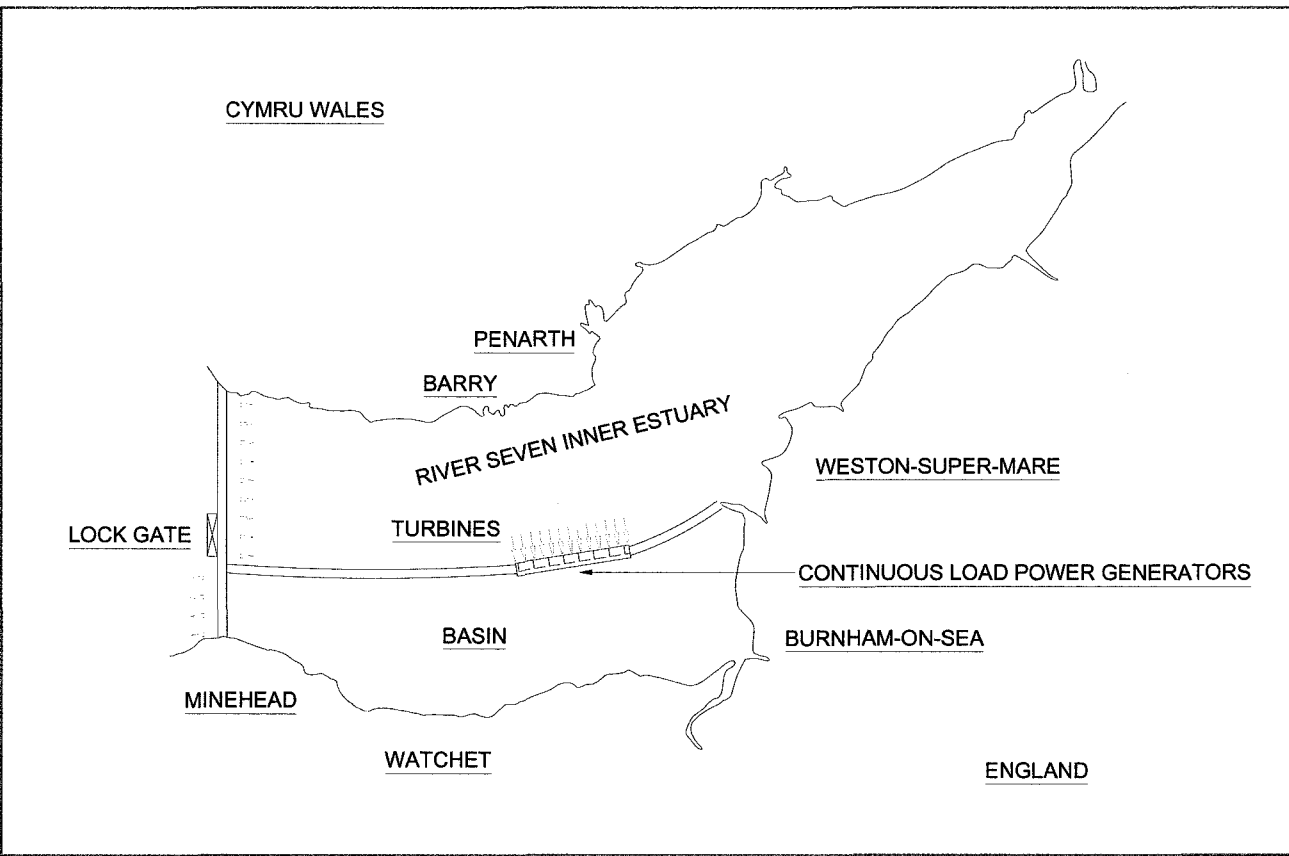
1. Income from sale of electrical power to the Grid.
2. Economic value having created flood defence and flood relief in the Severn and all tributaries.
3. Economic value arising from road and rail crossing from South Wales to South West England.
4. Economic value having created the largest maintained deep water sheltered port in the world.
5. Employment in the short, medium and long term.
  
- A. Environmental benefit of CARBON FREE POWER.
- B. Environmental benefit to fish and bird life arising from calmer, cleaner water.
- C. Political/Economic benefit of having a wholly UK source of power.
- D. Inflation proof power supply, having no fuel cost.

**Future Development**

Power generated at night has low value as there is low demand. Having a colossal source of Carbon Free Power would enable CARBON FREE FUEL, namely Hydrogen, to be generated by electrolysis. This may not at this time be viable but in the future, as carbon fuels become more expensive due to scarcity and taxation, the Severn Barrage may become a significant fuel generator at night when power to the Grid is not required.



# Severn Barrage Continuous Power





## SEVERN BARRAGE - CONTINUOUS POWER GENERATION

WATER LEVELS IN THE ESTUARY AND BASIN

