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Severn Tidal Power

RSPB briefing on the implications of the Eastern Scheldt (*Oosterschelde*) for the Severn Estuary

Introduction

2010 is a big year for the Severn, with the UK Government making critically important decisions on whether or not it should support tidal power development in the estuary, and if so on what terms.

The RSPB has sought to support and influence the UK Government's Severn Tidal Power Feasibility Study (STPFS) over the last two years and we championed the establishment of the Severn Embryonic Technologies Scheme (SETS).

The Severn is one of our most important and dynamic estuaries. Whatever choices are made about tidal power on the Severn must be informed by a thorough assessment and understanding of the geomorphological and hydrological implications. Fundamental to this, is the need to learn lessons from sites where comparable developments have taken place. The RSPB is convinced that reference in the studies to barrage projects in dis-similar environments – in particular the tidal power station at La Rance in Brittany - has severely underestimated the risks posed to the Severn by a tidal power barrage. To this end, we have been reviewing projects that might inform our response to the Severn, and in particular the lessons learned from the Eastern Scheldt in the Netherlands. There, construction of a storm surge barrier in the 1980s has had – and continues to have – massive negative implications for both wildlife and flood risk management including:

- **Significant and ongoing erosion** following construction: **By c2050 the area of intertidal will have halved** - by 2100 only 1500 hectares of the original 11,000 hectares will remain
- **The losses of intertidal habitat due to the construction of the barrier far exceed losses due to sea level rise** – 5100ha and 1200ha respectively by 2045
- As intertidal areas in front of flood defences ('dikes') are lowered or lost to erosion, **flood risk increases**, resulting in a **need for additional investment** to protect lives, land and property. Extra costs over the next 50 years on the Eastern Scheldt are estimated to be at best 25 – 45 million euros, and at worst 90 – 260 million euros depending on factors such as rates of sea level rise
- As tidal flats are eroded the area and duration of their exposure for feeding birds is reduced – **calculations suggest an 80% decline in Oystercatchers by 2045**

We consider that **lessons from the Eastern Scheldt are of critical importance** in informing next steps and future decision-making on the Severn and other estuaries where tidal power projects are proposed. Only adopting an 'eyes wide open' approach to the risks will we ensure that the UK makes the best and most informed choices for renewable tidal energy.

Setting the context: Climate change and renewables

Faced with the threats of climate change to the natural world the RSPB believes that a renewables revolution is essential to safeguard biodiversity. The RSPB therefore supports the Committee on Climate Change's conclusion that we should have zero carbon electricity by 2030. This will require us to make choices about technology mix, and judgements about environmental and social costs.

Inappropriately designed and/or sited developments can also cause serious and irreparable harm to biodiversity. Such damage is not inevitable. It is therefore essential that decisions about deployment of renewable energy be informed by, take account of, and seek to minimise environmental and other impacts. We argue that the UK Government should seek to ensure that the energy revolution takes place in harmony with the natural environment.

What has the Eastern Scheldt got to do with the Severn Estuary?

The Eastern Scheldt storm surge barrier in the Netherlands provides an excellent comparator for what might happen if a barrier is constructed across the Severn. The objectives differ – prevention of storm surges in the Eastern Scheldt and generation of tidal power in the Severn. However, both the estuaries and the structures concerned are physically similar (construction of large and only partially permeable barriers across dynamic estuaries with high sediment loads), and therefore the environmental consequences are comparable.

What are the implications for the Severn of the Eastern Scheldt experience?

Given similarities between the physical characteristics of the Eastern Scheldt and the Severn – and between the storm surge barrier and a tidal barrage - it is likely that similar effects to those seen in the Scheldt would occur if a barrage were constructed in the Severn:

- **Long term and ongoing erosion of intertidal areas:** Barrage construction (like construction of the Scheldt storm surge barrier) would lead to reduced water flows, making the deep estuary channels 'hungry' for sediment, and causing significant, long term erosion of intertidal areas
- **Increased flood risk:** As in the Eastern Scheldt, loss or lowering of intertidal areas in front of flood defences would result in a need for additional investment to maintain effective protection from flooding. In this respect, a barrage would probably have a worse effect than a barrier – holding water levels high for long periods of time, and therefore maximising the amount of damage that wave action will do in the upper intertidal areas and to the defences themselves
- **Catastrophic declines in internationally important bird populations:** As in the Eastern Scheldt, as tidal flats are eroded the area and duration of their exposure for feeding birds is reduced. We would expect to see catastrophic declines in the internationally important populations of waders and wildfowl

Clearly, the scale of such effects would differ between the two estuaries – but it is worth bearing in mind that the **Eastern Scheldt is less than two thirds of the size of the Severn.**

It should be noted that – unlike the storm surge barrier which has open sluice gates for most of the time to allow limited tidal flow through the barrier – the turbines and water pressures associated with a tidal barrage would have additional effects not seen in the Eastern Scheldt.

For example, a **barrage would act as a barrier to migration of internationally important fish populations** including salmon and rare lamprey, which currently move through the Severn on migration between the sea and their breeding grounds in the Rivers Wye and Usk.

What are the implications for the UK Government's Severn Tidal Power Feasibility Study?

The UK Government is nearing completion of its feasibility studies into the current short-list of tidal power options for the Severn, but has failed to make the results of those studies available. However, on the basis of what little we know, it would appear that the results of the geomorphological assessments, in particular in relation to the Cardiff to Weston barrage proposal, **may show a range of impacts as severe, if not more so, than those seen in the Eastern Scheldt**. The RSPB has been consistently critical of the Government's approach to the STPFS which has been barrage-centric and focussed on technical feasibility and energy yield. Both early indications of the results of the Study and the lessons from the Eastern Scheldt are further evidence of the folly of this approach. The failure to consider environmental and social costs has led to a focus on immensely damaging and costly options for tidal power generation, instead of a focus on developing other potentially more benign technologies, which have been sidelined within the process.

Conclusion

It is arguable that, had the Eastern Scheldt case been more properly investigated at an earlier stage in the process, the vast amounts of time and money spent assessing the impacts of a Cardiff to Weston barrage could instead have been used further to develop the potentially less damaging options which have been considered by, but thus far sidelined within, the Government's Severn Tidal Power Feasibility Study.

Recommendations and next steps

- 1) The results of the **Government's STPFS geomorphological studies** will be critical to – and are a prerequisite for – the next steps in the decision-making process. They **must be made available at the earliest possible opportunity**.
- 2) The **lessons learnt from the Eastern Scheldt storm barrier must be fully incorporated into development of understanding of the likely impacts of tidal power developments on the Severn and other UK estuaries**. The UK Government has repeatedly been made aware of the relevance of this case to the Severn, and yet key information is only now available in English thanks to collaboration between Dutch experts and the RSPB.
- 3) Future assessments and decision making in relation to the generation of tidal power in the Severn and other major UK estuaries must leave behind the barrage-centric and technical feasibility-led approach adopted to date, and must instead **focus on how to maximise clean energy production, while minimising flood risk implications and harm to the natural environment**.

We do not have all the answers – but believe that the story of the Eastern Scheldt begs fundamental questions which must be addressed by politicians as a matter of urgency before irreversible and potentially catastrophic decisions are made about the future of the Severn and other major UK estuaries.