



Campaign to Protect  
Rural England

## **Severn Tidal Power Feasibility Study Consultation A joint National CPRE and CPRE South West Regional Group response**

### **Introduction**

1. The Campaign to Protect Rural England (CPRE) welcomes the opportunity to comment on the Severn Tidal Power Feasibility Study Consultation. CPRE supports the UK's proposed 15% renewable energy target and the 80% greenhouse gas reduction target, two of the primary justifications for energy development in the Severn Estuary. We believe that promoting energy efficiency and reducing energy demand are the first measures that should be adopted to achieve these targets, but we recognise the renewable-energy potential of the marine environment, and that the Severn Estuary may have a significant role to play in meeting the targets if environmental concerns can be met.

2. CPRE exists to promote the beauty, tranquillity and diversity of rural England by encouraging the sustainable use of land and other natural resources in town and country. We have over 60,000 supporters and operate as a network with over 200 district groups, a branch in every county, a group in every region and a national office. This response was jointly written by CPRE's National Office and South West Regional Group, with input from members and volunteers throughout the South West.

3. CPRE's main area of focus in the debate over tidal power relates to landscape and the impact of tidal power development on rural communities and the rural environment. As such, our response considers each of the overarching questions posed in the consultation document, and then focuses only on those questions that relate to our concerns.

### **Overarching Questions**

*Question 1: Is the feasibility study taking the right issues into account?*

4. CPRE believes that it is important that all possibilities for generating energy from renewable resources are properly investigated and analysed. However it would be a mistake for projects to be pursued which do significant and irreparable damage to our environment, in particular to our landscape or seascape including wildlife diversity.

*Question 2: Are there other aspects or other evidence that should be taken into consideration?*

5. The Severn Estuary is a unique nationally and internationally important wildlife habitat and is of outstanding landscape and seascape value. Its landscape and seascape value is enhanced because it is bounded by a National Park and several AONBs but much of the smaller scale landscape bordering the estuary is beautiful and remote and often recognised in local designations. An important example is the Somerset Levels and Moors which though well recognised as a distinctive wetland landscape and for their outstanding ecology have not been formally designated for their landscape significance. We do not believe sufficient emphasis has been put on local landscape in the Feasibility Study work.

*Question 3: Have we given due weighting to the different benefits and impacts under consideration in our analysis?*

6. Any project in the Severn Estuary is balancing two national objectives – the generation of renewable energy and the protection of nationally important environmental assets. The judgement of the projects is not just economic and we are glad to see that clearly set out in the objective of the further study.

*Question 4: Do you think that it is better to wait for new and perhaps less environmentally damaging technologies to be developed, or to move ahead more quickly with available proposals?*

7. CPRE in principle supports a Severn Estuary tidal power project subject to environmental assessment demonstrating that its environmental impact is acceptable, and the costs are reasonable.

8. Against this background CPRE supports moving on to the next stage of study of the options and, assuming that the Tidal Fence and Tidal Reef options are considered available proposals, does not advocate delaying in the hope that new technology will come forward.

9. We agree with the elimination of five of the options on the long-list on the grounds of relative costs, uncertainty and ensuring that the next stage of study is manageable.

### **General Comments**

10. On the basis of the outline studies presented, the Tidal Fence and Tidal Reef options appear to offer the prospect of large power output but with relatively limited environmental damage. We strongly support their inclusion in further studies but agree that more research needs to be done to establish their full costs, technical reliability and environmental and other impacts.

11. The aim of this research should be to bring the definition of these options to the same level of technical and construction confidence as the more conventional barrage options so that the relative risks can be fairly assessed. We are concerned that this aim should not be prejudiced firstly by lack of funding and secondly by a narrow view of the technical options. We would therefore urge that:

- a) the amount of funding is not limited at the outset to £500,000 but is based on a full technical expert assessment of how much work is needed to achieve the aim for each of the projects of technical and construction risk definition. We believe that the amount of money is likely to be small in comparison with the eventual cost of the project and the potential gains are large;
- b) the technical studies investigate the potential for designing out the currently perceived risks rather than simply working out in more detail the options as currently presented. (We attach a short note from one of our members, who has engineering expertise in this field, which explains this in greater depth). (ref consultation question 17.)

12. One of the issues identified is the intermittency of supply from tidal power. We would suggest that all options are examined for their ability to generate electricity on both the ebb and flow tides as this would provide power over a longer duration albeit at some loss of peak power output. (ref consultation question 17)

13. We recommend that the Cardiff - Weston barrage should be dropped from the options at this stage. The evidence put forward so far shows that:

- it would have an unacceptable impact on the sea and landscape bringing a quite alien man made element into the far reaching sweeping views of the estuary from many points along the higher ground on either coast. This would be further damaged by the

major infrastructure of roads, pylons and gathering stations needed to service the barrage and bring the electricity into the grid;

- this option would result in greater damage to internationally recognised wildlife habitats than any of the other options. We agree with Natural England that this level of damage could not be ameliorated or compensated for and is unacceptable. We recognise that in the long term global warming may result in a significant rise in sea levels but the effects will be different because it will take place over some years or decades and the pattern of tidal ebb and flow is maintained;
- the construction period would be long and would cause significant disruption and ecological damage. There is a risk that some of this damage would be permanent;
- the cost and the construction risks are high and there does not appear to be a compensating benefit of lower long term cost of electricity versus other options.

14. We do not think that these manifest disadvantages are outweighed by the larger quantity of electricity generated particularly as that in itself would generate larger problems of balancing the intermittency of supply, compared with other options. (Ref. consultation question 16.)

15. The feasibility studies omit specific identification for each option of the onshore facilities and transport infrastructure needed both during the construction phase and subsequently. These need to be costed as they affect the overall economics of the option, and they need to be assessed fully for their environmental impact. In our view it is likely that facilities such as roads and temporary buildings required for construction may well not be removed but converted to other uses (see our comment on assessment of landscape impact below). Furthermore, some options may be capable of supporting cross-Severn transport links in the future. Given that the projects are expected to be operational into the next century it would be short sighted not to take account of this potential in the design, costing, ranking and environmental impacts of the options. (ref. consultation questions 2 and 3).

16. There is no mention (except in section 8.5 of the main consultation paper where there is a list of other plans and potential developments which may interact with a Severn Tidal Power option) of the possibility of nuclear power development at any one of the three possible sites on the Severn estuary. There is a reference to Hinkley and Oldbury on page 29 para (c) of the Society and Economy Topic Paper appended to the SEA scoping paper; but there is no further reference and any potential impact is entirely missing from the issues. A prime requirement of any Severn Tidal Power project should be that it should fully consider the impact of tidal power generation on other low-carbon generation options, including development of the nuclear power option. This objective should be written into the study. We understand the possibility of conflict is likely to arise because nuclear power stations use large amounts of water which would be taken from and discharged back into the River Severn. The sites are also adjacent to the river and their stability might be affected by any permanent change in the water table. (ref. consultation question 11)

17. There are a number of issues missing from the SEA Scoping Report and associated topic papers or where the definition of the issues/impacts is not sufficiently precise. (ref consultation questions 20 and 21). These include:

- the relevance of the 1km inland boundary of the study area. This is not at all clear. Its relevance needs to be demonstrated and clarified. The spatial and temporal range defines the study area as being the lateral fringe and 1km inland of the Severn Estuary and its tributaries up to their tidal limit. It would be expanded in certain cases but the

examples given are to do with migratory birds or tidal effects. Conversely, in the Resources and Waste Topic Paper the whole of the South West Region and South Wales are considered as sources for materials and sites for disposal of waste: similarly, the area for impacts on housing and the economy is very wide. We would recommend that for each of the topics a separate clear statement is made of the area to be covered in the study.

- the Freshwater Environment Topic Paper is about hydrology, i.e. the effect of each project on the water table in the land bordering the estuary. However the focus is on the effect on public drinking water, drainage, buildings and certain SSSIs. There is no mention of the effect on farming. Given that the study identifies the estuary as primarily a rural area, one of the significant issues should be assessing what, if any, effect the changes in the ground water levels will have on agriculture. Experience from major dam projects worldwide has been that there have been significant and in some cases highly damaging effects on agriculture from permanent change in the water table.
- landscape is dealt with quite inadequately. While the definition of the term “landscape” is now well recognised there is no such consensus on the definition of the term “seascape”. For the purposes of these studies we suggest clarity is needed. We attach hereto a definition which we have submitted as part of our submission on the Marine Bill currently going through parliament. (See attachment 2)

18. The SEA scoping study recognises that visually the developments could have an impact quite a distance away. However, these are seen as seascape effects and the approach gives the appearance of being only concerned either with the shore line or views from distant designated areas. What is critical in assessing landscape/seascape effects is to have a rigorous and consistent approach to the full range of impacts from the local to the far distant. The tool to do this is landscape character assessment including identification of landscape sensitivity. This has to be specific for the piece of landscape in question.

19. The SEA is expected to rely heavily on existing published landscape and seascape assessments at the national or regional level. These assessments are totally professional but course grained. They will be effective for understanding sensitivity to development in general or for very large scale and distant effects. Some more localised landscape assessments have been done and will give a better understanding of sensitivity. We list in attachment 3 to this submission landscape assessments of which we are aware and which may be helpful. However even the published local assessments are not sufficiently focussed and we believe it essential that for each option a specific landscape character assessment should be done of the area immediately (say within a 1 mile radius) of the landfall site of each option. The areas assessed should be large enough to include all the ancillary facilities linked to the option and developments both during the construction and operational phases. The key special characteristics and their sensitivity to change must be properly documented.

20. Historic landscape assessment can give additional insight. For instance the Somerset Levels and Moors are regarded as at least of regional and probably national value, even though not formally designated for landscape value.

21. The combination of different local archaeological, biodiversity and access land interests can also combine to create high value. So it is important to look, for example, at the distribution of common land and access land. There are also a number of sites of value as geological teaching locations along the Severn estuary and some assessment of these would be appropriate.

22. Only with such a comprehensive data base can the full range of impacts specific to the site/area of each option be assessed including the longer range visual impact on for instance elevated parts of AONBs.

23. There is also an intention to expand the CPRE tranquillity mapping to Wales. This is good but it is unclear what the mapping will be used for. Use of tranquillity mapping is a complex issue. CPRE would be happy to advise on this aspect of the studies.

24. Issues of impacts on habitats and species, including migratory birds and fish, and on the extensive areas within the Severn Estuary designated for their national, European and international nature conservation importance are addressed in some detail and there are certain assessment requirements under the Habitats Regulations. Bodies such as Natural England, Countryside Council for Wales, the RSPB, Wildlife Trusts and the Wildfowl and Wetlands Trust are better informed on these matters and we are likely to endorse concerns they may have. However it is essential that the landscape/seascape impacts of any proposals for compensatory habitats are examined as these may be very significant, particularly for the larger schemes. As presently worded the emphasis is solely on the beneficial effects on wildlife.

25. Waste and Resources are dealt with in a very broad brush way being based on SW Region and South Wales data. The scope puts emphasis on availability/sourcing of resource and waste disposal facilities. There is little if any mention of the transport effects such as capacity of the road network, congestion, increased pollution etc. We recognise that in part that is because the source of materials for construction, particularly aggregates, has not yet been identified. However it is worrying that the topic paper appears to duck the issues by stating that “It is not possible to determine the source of resources for each option in the feasibility study and in the SEA therefore only a relative comparison of the resource requirements will be made.” It is essential that the studies do make an assessment of the capacity at increasing distance and therefore the likely requirement for more quarrying or longer distance transport. We would further add that the increased quarrying of materials may have unacceptable impacts on the landscape, for instance sourcing much larger annual quantities than currently licensed from existing quarries in the Mendips or the Cotswolds.

26. Transportation is mentioned in the Society and Economy Topic Paper but it is seen only as an issue of noise and pollution as a health risk. In part this is because para 3 page 130 of the scoping report states “as this study does not involve any new transportation links, traffic and transport are not considered significant enough to warrant a stand alone topic but are considered under Society and the Economy.” The result is the study will not bring all the effects together and allow assessment of the cumulative effects of resource, waste, workforce and construction equipment transportation, or consideration of the most sustainable alternatives. We believe that there should be a separate topic paper covering all aspects of transport for each option including the construction phase.

27. Housing is covered extensively in the topic paper but the assessment is not focused on the local market or the likely need for temporary (sic) accommodation for the construction workforce. All potential housing issues should be analysed by reference to the South West Regional Spatial Strategy 2006 – 2026 which is in final draft form.

CPRE  
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### **Technical Breadth of Severn Power Options Study**

The approach taken in the stage 1 Interim Options Analysis Report appears to give an insufficient basis for government decision making. The report analyses the specific “as submitted” details of each option without sufficient consideration of the conceptual aspects of the components of each option. Consequently, in its analysis of the pros and cons of each option the report failed to distinguish those aspects of each option which are a necessary part of the option from those that are not. For example, the report heavily penalises the tidal reef because of the technical risk associated with the rotating turbine modules, the siphon and proposal to mount turbines on the lock gates. The main necessary feature of the tidal reef is the low head operation, which would make it far less destructive of the protected inter-tidal areas and wildlife habitat. Because of the reduced head the technical risk associated with the reef’s “wall” is very likely to be lower than associated with the wall of the Cardiff/Weston barrage.

The best way to reduce technical risk is to design it out. All of the high technical risk items for which the reef is criticised can be designed out without compromising the reef’s low head concept. Examples of lower risk choices are:

- the siphons can be removed from the design by mounting the turbines below the lowest astronomical tide (LAT) as is proposed for the Cardiff/Weston barrage;
- the rotating turbine modules can similarly be avoided by mounting turbines below the lowest astronomical tide (LAT). Available bi-directional turbines could be used or conventional turbines could be mounted laterally or vertically with flow direction controlled by penstocks;
- any benefit from mounting turbines on the lock gates is nullified by the associated technical risk. This feature should be deleted.

### **CPRE Suggested Definition of Seascape**

CPRE's proposed definition of seascape is:

*“features or defined areas of sea or tidal water, including the coastline, of natural beauty or cultural significance or a combination of any of these reasons.”*

Views from land over the sea are an integral part of a coastal landscape. Coastal waters and the coastline are indivisible, both in terms of the natural processes at work which create the coastal morphology and in terms of the visual integrity of land and sea when viewed from land. Coastline viewed from the sea is similarly indivisible from its marine setting.

The United Kingdom Government has shown the importance it attaches to the concept of landscape by ratifying the European Landscape Convention. English Heritage has also conducted a Historic Characterisation of Seascapes similar to its Historic Characterisation of Landscapes. Just as our finest terrestrial landscapes are designated as National Parks and AONBs, so our finest seascapes, including the marine dimension of our nationally protected landscapes on the coast, should be protected. CPRE is pursuing this through the current Marine Bill by supporting amendments to ensure that Marine Conservation Zones can be designated grounds of their natural beauty or cultural, archaeological or geological heritage.

For many people, the clearest and most relevant manifestation of the marine environment is the view of it from land or from the surface of the sea. CPRE believes that the understanding of the sea and its wildlife is in large part informed by the experience of the view of the sea and its coastline. This is not to say that seascapes are defined simply by the view. They embrace not only the natural world as expressed in terms of biodiversity and physical features but also the human world in terms of the historic and cultural heritage, opportunities for recreation and enjoyment of beautiful scenery, and the connections and associations between them.

### **Landscape Character Assessments Published**

The study should use the national landscape character areas and their descriptions in Countryside Character Volume 8: South West (Countryside Agency, 1999). Those national character areas adjoining or close to the Severn Estuary are no. 106 Severn and Avon Vales, 105 Forest of Dean and Lower Wye, 142 Somerset Levels and Moors, 141 Mendip Hills, 118 Bristol, Avon Valleys and Ridges, 146 Vale of Taunton and Quantock fringes, 145 Exmoor and 144 Quantock Hills.

More detailed landscape assessment work available for the area adjacent to the Estuary includes, for example: *historic* landscape character assessment for Somerset and Exmoor (2001) and an earlier similar study for the former Avon area (1995 – 99). A more recent detailed landscape character assessment study was published for Exmoor in 2007 with similar work carried out for Taunton Deane district. Gloucestershire County Council has produced detailed landscape assessments covering both sides of the estuary (2006). Details of this work are available from the relevant local authorities.

In addition, we are aware of the *Advice on Potential Landscape/Seascape And Visual Impacts of a Severn Barrage*, prepared for Natural England by Land Use Consultants in March 2007. That document was discussed in a stakeholder meeting on landscape impacts. It refers to the work of the Countryside Commission for Wales on seascape. Chapters 6 and 7 discuss potential impacts on the adjacent character areas.