WWF for a living planet

WWF-UK Policy Position Statement Tidal Energy in the Severn Estuary

Pete Raine, updated by Emmalene Gottwald
August 2009

Revision Date: *August 2010*
PPS Monitored By: *Luke Wreford*
Key Contact for further information: *Emmalene Gottwald*

WWF-UK Policy Position on Tidal Energy in the Severn Estuary

SUMMARY OF WWF-UK POSITION

WWF-UK believes that a revolution in our energy systems is vital if we are to meet the challenges of climate change and energy security. Our absolute priorities must be a strong drive for reduction in energy demand, improved energy efficiency and rapid deployment of sustainable, low-impact renewable energy technologies. We strongly support the government's commitment to deliver the UK's fair share of the EU renewable energy target for 2020, but in doing so it must respect wider concerns over environmental sustainability. WWF-UK is concerned that the Feasibility Study into Tidal Power in the Severn Estuary will prioritise energy output over environmental and economic impacts, resulting in a bias towards traditional generation proposals that are more fully developed without full and proper consideration being given to all reasonable alternatives. We welcome the government's actions to support embryonic technologies and provide funding and expert assistance to further develop and consider conceptual ideas that are potentially less damaging on the environment. We urge the government to ensure that alternative, lower-impact options to exploit the Severn's tidal energy are fully and properly explored within the ongoing feasibility study, and to ensure that its overall energy policy is designed to deliver rapid uptake of lower-impact technologies both in the Severn and across the UK.

INTRODUCTION AND SUMMARY

In 2008, the UK and Welsh Assembly governments commenced a feasibility study to assess whether they could support a tidal power project in the Severn Estuary. Tidal power in the estuary has the potential to contribute up to 5% of present UK electricity demand (a little less than 1% of overall UK energy consumption). The larger barrage schemes would be financially and environmentally costly, with construction cost estimates of up to £34.7 billion and intertidal habitat loss predictions of up to 28,000ha.

The Severn Estuary is a wildlife habitat of international, European and national nature conservation significance. This is reflected in its status as a Special Protection Area (SPA) under the European Commission Birds Directive[1] and a Site of Community Importance under the Habitats Directive[2], with full designation as a Special Area of Conservation (SAC) expected by the end of 2009. The Severn is classified as a Ramsar Wetland of international importance and also comprises a number of Sites of Special Scientific Interest (SSSIs). The rivers Wye and Usk are also designated as SACs, in part because of their migratory fish populations which are wholly dependent on the Severn Estuary.

Phase One of the feasibility study has now been completed, including an initial assessment of the long list of ten options against a number of criteria, scoping for the Strategic Environmental Assessment (SEA), screening for a Habitats Regulations Assessment and preliminary review of possible mitigation and compensation

[1] Council Directive 79/409/EEC on the conservation of wild birds
[2] Council Directive 92/43/EEC on the Conservation of natural habitats and of wild fauna and flora

measures. Ministerial Review of Phase One resulted in a recommended shortlist of five options being produced, all comprising barrage or lagoon technology. Public consultation on the outcomes of Phase One and the recommended shortlist occurred between January and April 2009.

At the same time as commencing public consultation on the studies undertaken in Phase One of the feasibility study, the government announced funding and a new scheme for consideration of innovative technology options proposed for the Severn. The Severn Tidal Power - Embryonic Technologies Scheme (SETS) was formally launched on 2 April 2009 with an initial funding pool of £500,000 (to be match funded by applicants) available. The stated aims of the SETS are to:

(a) develop embryonic technology designs to outline design stage;
(b) increase the level of confidence in the technical feasibility of the proposals, construction costs, energy yields and profiles and cost of energy; and
(c) increase confidence in timescale for development of the proposal by providing a broadly costed routemap setting out the path to commercial deployment.

The government gave assurances that the outcomes of SETS will inform the feasibility study and any innovative options determined to have merit at the end of the scheme will be added to the shortlist and subject to final assessment under the feasibility study.

On 15 July 2009, the Government released its response to the Phase One consultation. It was released as part of a package of documents including the Renewable Energy Strategy (RES) and the UK Low Carbon Transition Plan (LCTP). Both the RES and the LCTP have the aim of meeting the EU renewable energy target which is strongly supported by WWF-UK. Tidal power from the Severn Estuary is considered an option to utilise for meeting this target, subject to the outcomes of the Feasibility Study.

The Government response confirmed the shortlist of five options as unchanged and outlined the further studies and high level analysis that would now be undertaken in Phase Two of the Feasibility Study. In addition, three schemes were announced as receiving funding under SETS – one low head barrage and two tidal fence proposals.

In this context, WWF-UK has sought to form a preliminary view on the potential for tidal power in the Severn Estuary, although this view cannot be confirmed until the results of the feasibility study and other assessments (including an SEA under the EC Directive on SEA[3] and an Appropriate Assessment under the Habitats Directive) have been properly completed and considered.

WWF-UK believes that a revolution in our energy systems is vital if we are to meet the challenges of climate change and energy security. Our absolute priorities must be a strong drive for reduction in energy demand, improved energy efficiency and rapid deployment of sustainable, low-impact renewable energy technologies. We strongly support the government's commitment to deliver the UK's fair share of the EU renewable energy target for 2020, but in doing so it must respect wider concerns over environmental sustainability.

[3] Directive 2001/42/EC of the European Parliament and of the Council of 27 June 2001 on the assessment of the effects of certain plans and programmes on the environment

WWF-UK is concerned that traditional engineering concepts, such as a barrage, may impose unacceptable environmental impacts on the estuary and entail a serious breach of the Habitats Directive. We welcome the government's decision to fund and assist in further development of innovative, low impact technologies. We call on the government to ensure that these options to exploit the Severn's tidal energy continue to be fully and properly considered within the ongoing feasibility study and to ensure that its overall energy policy is designed to deliver rapid uptake of lower-impact technologies both in the Severn and across the UK.

WWF-UK's LOCUS

Tackling climate change is central to WWF's mission, which is: to stop the degradation of the planet's natural environment and to build a future in which humans live in harmony with nature. We work closely with the Welsh Assembly Government, with the UK government on sustainable housing and the development of the Climate Change Act, in Europe with the power sector and with governments on the Emissions Trading Scheme, and globally with finance, business and with governments promoting Kyoto and its successor agreements. We are partners in a new £100 million global project to conduct scientific research, stimulate activism and advocate solutions at the interface between climate change and freshwater ecosystems. Work on our many field projects throughout the world has given us unrivalled firsthand knowledge of the impacts of climate change on wildlife and human livelihoods.

We are also very supportive of low-impact renewable technologies, which we described in our 2002 report *Turning the Tide* – the first assessment of the potential of tidal energy in the UK. In April 2007 we published *Climate Solutions*, which set out at a global level how climate change can be tackled through a combination of demand reduction, energy efficiency and low-impact renewable technology. In October 2007, we published *80% Challenge – Delivering a Low Carbon UK* in conjunction with the RSPB and IPPR, in which we showed that the UK can reduce land-based carbon emissions by up to 95% by 2050 without recourse to nuclear energy, excessive biofuels or the full Severn Barrage. In June 2009, we published *Managing Variability*, a report to WWF-UK, RSPB, Greenpeace UK and Friends of the Earth EWNI which found that managing wind variability can be achieved using existing technological developments at a modest and declining cost.

Our position has consistently been that we support much tougher emissions targets for the UK through the Climate Change Act and for the EU, and that we consider that these targets can and should be met using sustainable and low-impact technologies.

CLIMATE CHANGE AND ENERGY POLICY

WWF-UK believes it is vital to address the energy crisis through a combination of energy efficiency, demand reduction, and renewable and sustainable low-carbon technologies.

While simply meeting UK government and EU targets should not be the only driver, we do believe that the EU renewable energy target is a very important milestone. WWF-UK strongly supports the recommendation of the Committee on Climate Change to decarbonise the UK's energy sector by 2030.

It is now time for the UK to move beyond assessing only potential and focus on maximising deployment of renewable energy. The new Renewable Energy Strategy and policy framework must encourage all practical and sustainable renewable energy

resources to offer their full contribution to the UK energy mix – so moving towards a clean, low carbon, diverse and sustainable energy system fit for the 21st century.

WWF-UK believes that the over-riding priority for government policy must be to ensure credible and speedy delivery of UK targets for energy efficiency and binding EU renewable energy targets. In doing so, it will help ensure that the key objectives on energy security and climate change mitigation are achieved. While there may be some significant costs involved initially, an efficient energy system powered by renewables will be less exposed to shocks in fossil fuel prices – and the shift to such a low carbon economy can be expected to yield huge benefits in terms of job creation and new opportunities for British businesses.

However, it is important that strong sustainability criteria are applied to renewable energy technologies. Ambitious renewable energy targets should be met in ways that minimise environmental impact by ensuring selection of suitable proposals only after robust environmental assessment of all alternative options.

WWF-UK acknowledges that there may be a balance to be struck between the benefits of mitigating climate change through renewable energy technologies and their real or potential impacts on the natural environment. Some significant onshore and offshore renewable energy resources are situated in designated areas, including Natura 2000 sites (Special Areas of Conservation and Special Protected Areas (SPAs), which are protected by EU Directives), Sites of Special Scientific Interest (which are known as Areas of Special Scientific Interest in Northern Ireland) and other regionally and locally important sites. The Government must ensure that in achieving renewable energy targets, guiding policies and individual proposals are developed and undertaken in compliance with the UK's obligations under European Directives, such as the Habitats, Birds, Water Framework, Environmental Impact Assessment and Strategic Environmental Assessment Directives, and national legislative requirements.

SEVERN ESTUARY POTENTIAL

WWF-UK agrees that there is huge potential to take advantage of the tidal range in the Severn Estuary for energy generation, as it is one of the highest tidal ranges in the world. However, we are certain that low-impact modular technologies should be fairly and equally considered alongside permanent irreversible civil engineering solutions.

The government's feasibility study should ensure that all marine tidal technologies can be considered equally. According to WWF-UK legal opinion, the alternative solutions to be considered by the UK government under an Appropriate Assessment must be properly matched to the main objectives of the project which underpin the claim for imperative reasons of overriding public interest (IROPI). A barrage principally designed to produce long-term carbon-free energy at reasonable cost should be assessed against other potential ways of achieving those objectives. It follows that the possibility of tidal power of whatever sort – and indeed other forms of renewable energy elsewhere in the UK – must be assessed as possible alternatives.

Finally, it is important to recognise that none of the technologies proposed for the Severn Estuary – tidal range, tidal stream or hybrid – is proven at this scale. It is notable that Canada, the only country with similar tidal energy potential, is not considering tidal barrages, is very concerned about the potential impacts of tidal lagoons, and is much more in favour of tidal stream turbines. The Fundy Tidal Energy Strategic Environmental Assessment published in April 2008 concluded that:

'*until near and far-field effects of marine renewable energy are well understood and deemed to be acceptable, development should take place by modest increments supported by an effective and transparent research and monitoring program, installations should be removable, and clear thresholds should be established to indicate when removal would be required*'[4].

ENVIRONMENTAL IMPACTS

Any tidal proposal in the Severn Estuary will have some impact on an internationally important and sensitive habitat. This needs to be fully and fairly evaluated, both through the ongoing SEA and through the Appropriate Assessment, to evaluate the impacts of a tidal power project on the features of interest of the SACs/SPAs.

The more permanent and invasive the structure, the more severe the impact both within the Severn Estuary SPA and SCI and also within the upstream SACs of the rivers Wye and Usk. These impacts will necessarily include loss of intertidal mudflats and salt marshes, and impacts on the free movement of migratory salmon and other fish species.

The Sustainable Development Commission (SDC) concluded, and most fish experts agree, that building a barrage would result in fish stock eradication. The Severn Estuary has 110 species of fish, including seven different migratory fish; this is more than any other British estuary. The Severn is one of the most important British estuaries for several rare species, including river lamprey, sea lamprey and twaite and allis shads, and a run of migratory salmon and sea trout. These fish pass through the estuary on their way to and from their spawning grounds in the upper reaches of the rivers and the open sea. The estuary also has the largest eel run in the country, with established elver fisheries on the rivers Parrett, Severn, Wye and Usk.

A Severn tidal power project is seen by some as a way of urbanising south-east Wales and south-west England to create a metropolis with links to motorways and airport expansion. Proposals for renewable energy generation should be seen as just that – not as a serendipitous short cut to wider development which could lead to higher net CO_2 emissions. If any ancillary development is proposed to financially enable the barrage, then it should be fully considered as part of the SEA and the IROPI assessment under the Habitats Directive.

WWF-UK is also concerned about the sourcing of construction materials, CO_2 emissions associated with construction and from production and use of construction materials such as concrete. According to WWF-UK legal opinion, the application of the IROPI test must take into account the detrimental consequences that will flow from the construction, maintenance and operation of the tidal power project and its infrastructure, and from carrying out compensatory works.

If traditional technologies such as a barrage are implemented, it will be virtually impossible to remove such a construction if better technologies emerge in future. No barrage proposal has ever factored in the cost of decommissioning.

[4] http://www.offshoreenergyresearch.ca/OEER/SEAHome/tabid/117/Default.aspx

COSTS OF A BARRAGE

WWF-UK joined other environmental NGOs in commissioning Frontier Economics to assess the economic performance of a barrage. Its report, published in June 2008, concluded that there is no case for the government to make a special case of the barrage through public funding or special financial arrangements. While the Cost Benefit Ratio of the scheme must never be the paramount reason for its choice, it is important that scarce resources are invested as wisely as possible in energy futures. There are strong arguments in favour of government intervention in the marketplace, but subsidising a barrage may not be the best use of such an intervention.

Any government investment in the £15 billion-plus cost of a barrage will inevitably divert resources from other renewable energy technologies, including other tidal energy technologies, many of which are being developed by institutions in the UK and which have applicability (and business potential) all round the world. Most other renewable technologies are cheaper per unit of output than a full barrage, according to Frontier Economics.

THE SHORTLISTING PROCESS

In framing the recommended shortlist, the government's stated aim was to identify those proposals which are potentially feasible and exclude those that are not technically feasible. In responding to the Phase One consultation, WWF-UK expressed the view that the shortlist was determined at a premature stage of the feasibility study and that the assessment framework applied to develop the shortlist was flawed.

Releasing a recommended shortlist on the commencement of public consultation has the potential to bias the consultation process and limit full and open participation by stakeholders and members of the public on all alternative proposals. WWF-UK believes that the decision to shortlist a number of proposals at such an early stage is in conflict which the provisions of the UNECE Aarhus Convention[5] concerning public participation in decision-making which requires contracting parties to provide "…*for early public participation, when all options are open and effective public participation can take place*" (Article 6(4)).

It could be argued that the Government had made its mind up about which options it wished to take forward for further assessment and the outcomes of the public consultation did not affect this decision. As a result, we query whether the public consultation process was effective and valuable in helping the Government decide how to proceed with the next phase of the Feasibility Study.

A further reason that we submit that the determination of a shortlist is premature is because equal and proper consideration has not been given to all criteria specified as part of the assessment framework. Several of these criteria were explicitly excluded from full and proper consideration within Phase One of the Feasibility Study and did not have any influence on what options were shortlisted. The application of the assessment framework gave significantly greater weight to the quantitative criteria (technical risk, costs, amount of energy, affordability and value for money) in determining the shortlist, leaving the other criteria (environmental, regional and social impacts) to be properly considered at later stages of the Study.

---

[5] The UNECE Aarhus Convention on Access to Information, Public Participation in Decision-Making and Access to Justice in Environmental Matters entered into force on 30 October 2001. The UK ratified the Convention in 2005.

WWF-UK queries how a decision on a shortlist of options can be made when the proposals have not been properly assessed against **all** criteria forming the assessment framework. WWF-UK submits that this is approach is flawed and that equal consideration and weight must be given to each criterion so that each proposal can be fairly considered on its merits and a decision about which proposals to take forward is well informed and unbiased. While we acknowledge it would not be feasible to carry out comprehensive assessment for each and every permutation of options, the inevitable concern is that the basis of short-listing alternatives at this stage is surrounded in lack of information, is based on 'best guesses', and is not informed by the SEA.

WWF-UK, in conjunction with the Royal Society for the Protection of Birds (RSPB), the Wildfowl and Wetlands Trust (WWT), the National Trust (NT) and the Wye and Usk Foundation, commissioned Atkins Ltd to undertake a review of the assessment process used within the Interim Options Analysis Report (IOAR). The Review concluded, amongst other things, that:

(a) equal consideration was not given to the study aims of acceptable environmental impact and providing a significant amount of renewable energy at an affordable price. There was no attempt to modify the long listed options to reduce environmental impacts;

(b) the assessment approach seems to eliminate options before sufficient work has been done on optimising arrangements for generation and management of environmental impacts. The level of detail given in the IOAR is only sufficient to dismiss options that are clearly unreasonable;

(c) the short-listing assessment framework does not achieve a fair basis in its evaluation of energy, cost and environmental impact criteria and therefore gives some schemes unfair advantages over others. This is because the different schemes have different risks and environmental impacts;

(d) the assessment's methodology and outcomes are insufficient at this stage to adequately identify a shortlist of tidal power options for the Severn Estuary. Moreover, given the overarching objective of the Feasibility Study, which is to produce a reasonably affordable and strategically significant supply of renewable energy with acceptable environmental impacts, shortlisting should logically take place only after schemes are optimised to increase energy, reduce cost and avoid environmental impacts.

STRATEGIC ENVIRONMENTAL ASSESSMENT

The SEA Scoping Report specifies that the shortlisted proposals will form the reasonable alternatives for the purpose of the SEA and these will be compared against a "do nothing option". It is WWF-UK's view that the approach taken reflects a misunderstanding of the SEA Directive, misinterprets the objectives of the Feasibility Study and is not the correct approach for determining the reasonable alternatives to be considered within SEA.

SEA is intended to be a strategic level assessment that should inform the development of the plan and the identification, description and evaluation of reasonable alternatives. The SEA Directive requires consideration of 'reasonable alternatives', taking into account the plan's objectives and geographical scope. The Severn Tidal Power Plan should not be defined, and potential reasonable alternatives evaluated and discounted, prior to SEA being completed.

Taking into account EU guidance on SEA[6], WWF-UK considers it important to ensure that the options are not artificially limited at the outset and that potential reasonable alternatives should not be discounted prior to the SEA process being completed. The screening process undertaken by the Interim Options Analysis assumed that immediately feasible options are the only reasonable ones for consideration within SEA. In our view, less environmentally damaging options that may require pilot/prototype testing are also reasonable, since the geographic scope of the plan includes an important Natura 2000 site.

WWF-UK's view is that it should not be the shortlisted proposals which dictate the scope of the SEA. Rather, the SEA should be properly undertaken with an assessment of all reasonable alternatives, and that outcomes of the SEA should feed into the Feasibility Study to influence the development of the Study towards preferred options.

HABITATS DIRECTIVE

The integrity of the Habitats Directive must be maintained; any proposal should comply with the Directive, not only in genuinely considering alternatives, but also in providing truly compensatory habitats.

The aim of the Directive (as set out in Article 2) is to contribute towards ensuring biodiversity through the conservation of natural habitats and wild flora and fauna throughout the EU. However, measures taken pursuant to the Directive may take account of economic, social and cultural requirements and regional and local characteristics. As such, the Directive seeks to make a contribution to the general objective of sustainable development. In order to do this, it sets out a process for evaluating the likely impacts on a Natura 2000 site arising from a particular project or projects; whether there are available alternatives that should appropriately be pursued; whether a project should be progressed for imperative reasons of overriding public interest (including those of a social or economic nature); and whether suitable compensatory measures to ensure the overall coherence of Natura 2000 can be provided. Each of these steps must be rigorously followed if the integrity of the Directive is not to be eroded.

WWF-UK is concerned that the stages of the assessment are being completed out of sequence, in that premature assessment is being given to what compensatory measures are required before the other tests required by Article 6(4) of the Habitats Directive have been met. There are clear reasons for considering the adequacy of possible compensatory measures after having conducted the Appropriate Assessment, not least that there may be a number of alternative solutions to address the identified objectives of the project. Furthermore, assessing compensatory measures at this stage pre-supposes that there are imperative reasons of overriding public interest (IROPI) for proceeding with the project(s).

Given the not inconsequential costs of producing a report on compensatory measures, however preliminary, this suggests that whatever the outcome of the Appropriate Assessment and the subsequent application of the IROPI "test", the Government has already decided that a project of some description will inevitably proceed. In our view, this is unfortunate and calls into question the clear process of assessment and decision-making set out in the Habitats Directive.

[6] Commission's Guidance on the Implementation of Directive 2001/42 on the Assessment of the Effects of Certain Plans and Programmes on the Environment

We have very real concerns as to whether an adequate compensatory package can ever be provided, with reference to the extent of habitat that would be needed to compensate for the loss of the mudflats and (in particular) how the UK can compensate for the impact on species of migratory fish for which the Severn provides a stronghold. Our Counsel's opinion suggests the UK cannot provide a package of compensation which falls short of being equivalent to that which is lost; that the designation of additional SACs/SPAs can only form part of a package which also includes recreating or improving the areas so designated or classified ; that the UK government must take into account the special features of the Severn (its size, shape and extreme tidal conditions) when considering compensation and, more especially, the quantum of that compensation; and, finally, the question of whether rivers can be found elsewhere in the UK which are capable of providing a spawning ground to equivalent populations of the various species forming part of the SAC designation, such as Atlantic salmon, the shads and the lampreys .

REFERENCES

- BERR TOR for Feasibility Study www.berr.gov.uk/files/file43810.pdf
- RES consultation summary http://renewableconsultation.berr.gov.uk/
- *Turning the tide: Power from the sea and protection for nature*. Report to WWF-UK from Iwan Ball, Cardiff University, December 2002.
- *Climate Solutions: The WWF Vision for 2050.* Paper prepared for WWF International's Global Energy Task Force by Karl Mallon, Greg Bourne and Richard Mott.
- *80% Challenge: Delivering a low-carbon UK*. IPPR, WWF-UK and RSPB, November 2007.
- *Managing Variability*. Report to WWF-UK, RSPB, Greenpeace UK and Friends of the Earth EWNI from David Milborrow, Energy Consultant, June 2009
- *Analysis of a Severn Barrage: a report prepared for the NGO Steering Group* by Frontier Economics. June 2008
- SDC report www.sd-commission.org.uk/publications.php?id=607
- *Severn Tidal Power: Review of "Interim Options Analysis Report"*. Review prepared for WWF-UK, WWT, National Trust, RSPB and the Wye and Usk Foundation by Atkins Limited, April 2009.

OTHER RELEVANT WWF POLICY POSITION STATEMENTS

WWF-UK Policy Position Statement on Renewable Energy (2009)
WWF-UK Viewpoints on Planning (2008) – Q&As on the UK Planning System
WWF-UK Position on Ecotowns (2008)

FEEDBACK

We are keen to receive your views and comments in response to this Policy Position Statement, which we will be regularly updating. We also need to be aware of any new piece of work/research/evidence that you have undertaken that may affect this Policy Position Statement. There may also be gaps in the current position which we may not be aware of and which you may wish to highlight for any future review. Click here to email your feedback, and please state which Policy Position Statement you are referring to.