**The current position of the proposed**
**Tidal Energy barrage across the Severn Estuary**

A proposal for a tidal energy barrage has been considered from as early as the mid-eighteenth century and within the past decade a number of important Government sponsored studies were carried out to confirm the viability of the project and the tremendous clean and renewable energy such a project would produce. This is Severn Barrage Project and it will harness one of the world's largest potential sources of renewable energy: namely the 14 metre tidal range of the Severn Estuary.

The proposed barrage will create the largest renewable, green energy power station in the world, conservatively providing 5% of the UK's electricity demand, cleanly, sustainably, cheaply and predictably, producing 16.5TWh per year, at a cost significantly cheaper than other alternatives over its operating life of at least a 120 years. In addition to the obvious national attractions of such a project, the regional economic benefits on both sides of the Severn estuary would be substantial, with a significant job creation (the STPG study estimated as high as 50,000) and potential for a large, hi-tech, manufacturing hub in Wales and the west of England.

A recent previous promotor of the project (Hafren Power) failed to both appropriately engage with stakeholders and carry out the work and studies necessary to demonstrate that the tidal barrage across the Severn estuary is not only the most efficient use of the tremendous tidal energy potential of the region but also is environmentally friendly. Such studies would demonstrate both the low direct impact of the barrage and the multiple environmental advantages over the on-going degradation of the estuary through the process of climate change, that has in fact accelerated in recent decades.

The House of Commons Energy and Climate Change Committee (ECCC) highlighted these important concerns and deficiencies. The Government in response to the ECCC commented that the project has great potential and also stated that upon the studies which the ECCC highlighted being carried out, the Government would give the project "serious consideration", concluding the project is very much alive but requires more detailed studies.

In addition the sea bed of the coastal waters of the UK is owned by the Crown and managed by the Crown Estate. Accordingly permission is required from the Crown Estate to lease the land for any activity such as off shore wind, tidal lagoons or a tidal barrage. In the market engagement of December 2013 the Crown Estate specifically excluded the Severn Estuary from any market tender for the leasing of land for tidal energy in in order to, quote " avoid prejudicing further work or compromising any future proposals in relation to any Severn Barrage scheme."

Accordingly the project for a tidal energy barrage across the Severn Estuary is still, subject to carrying out the necessary work and studies proposed by the Government and the ECCC, a viable and ongoing concern which is being worked on with a new promoter, Severn Tidal Energy. We have formed a new strong management team with significant support, and shall be launching the campaign to promote the project in a new and all-inclusive manner by carrying out the work specifically requested by Government and by engaging all stakeholders in a collaborative and cooperative manner.

Wales is in a unique position at the moment, at the outset of the development of a globally significant hi-tech manufacturing industry. We feel that it is important that the Welsh Government supports firms looking to develop techniques and technology across the supply chain by creating infrastructure such as testing grounds. We greatly appreciate the opportunity to engage with the Welsh Assembly at an early time in the process in order to discuss the impact on job creation in Wales, the supply chain and manufacturing opportunities associated with this project, which will assist with the promotion of the environment and economy of Wales for the benefit of both the region and the country as a whole.

**Michael S Davies**
**Chief Executive Officer, Severn Tidal Energy Ltd**

**Appendix I – Market Engagement of the Crown Estate December 2013**

The Crown Estate
Tidal Range Projects - Market Engagement
December 2013

In line with The Crown Estate's strategic objective to support the growth and diversity of the renewable energy portfolio in the UK, we are seeking views from project developers, other companies in the industry and stakeholders about a possible approach to leasing tidal range projects.

To provide a framework for this dialogue, this document asks interested parties to provide information covering a number of areas, including; design, construction, consenting and finance to which we would welcome responses.
Written submissions are invited in letter form, e-mailed to: tidalrange@thecrownestate.co.uk
This document was published on 17th December 2013 and the deadline for responses is 17:00, 7th February 2014.

The Crown Estate
Tidal Range Projects – Market engagement to inform consideration of a leasing process that may be implemented in 2014/15.

1. Introduction

I. Tidal Range Interest
The Crown Estate is seeking to:  Understand the appetite and interest from developers of tidal range energy projects in the UK which have a reasonable prospect of commencing construction in the near term1; and,  Invite comment on the outline scope for a leasing process that is being considered for English and Welsh territorial waters, excluding the Severn Estuary2.

The rapid development of renewable energy capacity is central to the delivery of the EU's target of a 20% renewable energy contribution by 2020. The Crown Estate in its role as steward of the UK's seabed is keen to understand the extent to which tidal range projects can contribute to this target and complement the UK's growing portfolio of offshore wind, wave and tidal stream developments. The Crown Estate is aware of interest from the developers of potential tidal range projects and wishes to explore the readiness of the sector in contemplation of a leasing process. Subject to the conclusions from this market engagement exercise, we will consider commencing a formal competitive leasing process in early 2014, with a view to awarding seabed rights to successful applicants later in the year.

II. What is The Crown Estate
The Crown Estate manages the following assets on behalf of the Crown:  over half of the foreshore of the United Kingdom (being the area between low water and high water on the coast and tidal waters);  almost the entirety of the seabed to 12 nautical miles;  rights to natural resources on the continental shelf (excluding hydrocarbons) under the Continental Shelf Act 1964;  rights to exploit natural resources to enable generation of electricity from wind, waves and the tides on the continental shelf under the Energy Act 2004 (within the "Renewable Energy Zone"); and  rights to lease the transportation and storage of natural gas and carbon dioxide on the continental shelf under the Energy Act 2008 (within the "Gas Infrastructure and Storage Zone").

1 Near term means the ability to secure consent and move to construction by 31st March 2020.

2 See diagram 1 Under The Crown Estate Act 1961, The Crown Estate is entrusted to manage these assets of national importance with all net revenue being provided to HM Treasury for the benefit of the nation. The assets are managed on a commercial basis in accordance with the principles of good estate management and under a duty to enhance the

value of the assets and the return obtained from them. In doing so we engage with partners, statutory authorities and other bodies on a regular basis in order to facilitate the development of a world-class offshore energy capability, which is already bringing significant new inward investment, business and jobs to the UK.

Rights are required from The Crown Estate to install, own and operate renewable energy projects within UK waters and further information on the role of The Crown Estate, in the form of a briefing paper, can be found at; http://www.thecrownestate.co.uk/media/387737/role-in-offshore-renewable-energy.pdf.

III. Purpose of this engagement document:
The purpose of this engagement document is to invite comments from prospective tidal range energy project developers and other interested stakeholders on the outline of a potential leasing process for tidal range projects that is being considered by The Crown Estate. The document also describes the requirements that The Crown Estate would require applicants to meet, and the rights that The Crown Estate may grant. This is to help inform prospective developers' understanding of what is likely to be required to secure rights, and when they might be ready to seek rights from The Crown Estate. Responses will inform the development of leasing processes that The Crown Estate may undertake in 2014 or thereafter.

2. Approach and Timetable

I. Outline scope of the potential leasing process
The Crown Estate is engaging with Government, prospective market participants and other stakeholders to understand the level of support for and readiness of tidal range projects in UK waters. We are inviting comment on the outline scope of the potential leasing process, which would cover proposals for projects of up to 1GW in installed capacity, to be located in English and Welsh territorial waters, excluding the Severn Estuary.
The Crown Estate would only consider granting rights through any immediate leasing process to projects that have a reasonable prospect of commencing construction in the near term, i.e. prior to the 31 March 2020. However The Crown Estate would not rule out the potential for further processes at a later date and to a different timetable.

II. Rationale for scope
i. Engagement: The Crown Estate is engaging with UK, devolved and regional bodies because the successful development and installation of tidal range projects is likely to require policy and financial support, may require specific actions by Government bodies, and would involve extensive work with statutory authorities. Engagement with these bodies is intended to help inform them of the approach The Crown Estate is considering, and to ascertain whether there are any specific issues relating to policy, financial support or regulatory regime that should be reflected in the scope and timing of any process that we may undertake.  Engagement with prospective market participants is intended to inform locational and timing aspects of the approach The Crown Estate might undertake, and give an indication of the level of interest in developing tidal range projects at this time.  Comment is invited from other stakeholders with an interest in UK tidal range energy projects to help inform the development of any leasing process that we may subsequently take forward.

ii. Spatial Extent:
The Crown Estate Seabed: Any potential leasing process would be limited to areas of the seabed and foreshore that form part of The Crown Estate within UK territorial waters3. The Crown Estate does not have the power to grant rights outside of the UK, and at this time is not aware of any interest in developing tidal range projects beyond territorial waters.

Scotland and Northern Ireland: At present The Crown Estate does not intend to run a leasing process in these locations. Unlike in England and Wales, the most recent Strategic Environmental Assessments (SEAs) for Scottish Territorial Waters and offshore Northern Ireland do not cater for tidal range energy projects. However, we welcome comment from organisations with an interest in developing a tidal range energy project proposal in these areas. This will help us

understand the market interest in developing projects in these areas, and we will provide a summary of responses to relevant government bodies

The Severn Estuary: The Energy and Climate Change Committee (ECCC) inquiry report; http://www.publications.parliament.uk/pa/cm201314/cmselect/cmenergy/194/194 02.htm issued in June 2013 examined a new proposal for a tidal barrage in the Severn Estuary, and included conclusions that:

- Further research, data and modelling are needed before [the] environmental impacts [of a Severn Barrage] can be determined with any certainty.
- The need for compensatory habitat on an unprecedented scale casts doubt on whether [a Severn Barrage] project could achieve compliance with the EU Habitats Directive.
- The Government should remain open to considering any marine project in the Severn which is able to comply with the requirements of the relevant EU and UK legislation, including a potential barrage scheme. i.e. to the 12nautical mile limit.
- Harnessing the energy of the Severn would offer significant decarbonisation and energy security benefits.

The ECCC inquiry report recommended:

- Consideration is given to first developing a smaller scale tidal [range] project, in order to build a stronger evidence base for assessing impacts, risks and costs before proceeding with any larger scale scheme.
- The Government should take this into consideration before approving the development of projects in the Severn estuary.

In response to the ECCC report the Government agreed in principle to the direction, whilst recognising that the unique environment in the Severn Estuary means that not all potential schemes provide a comparable evidence base.

Any potential leasing process is likely to exclude the Severn Estuary (as indicated below) to avoid prejudicing further work or compromising any future proposals in relation to any Severn Barrage scheme.

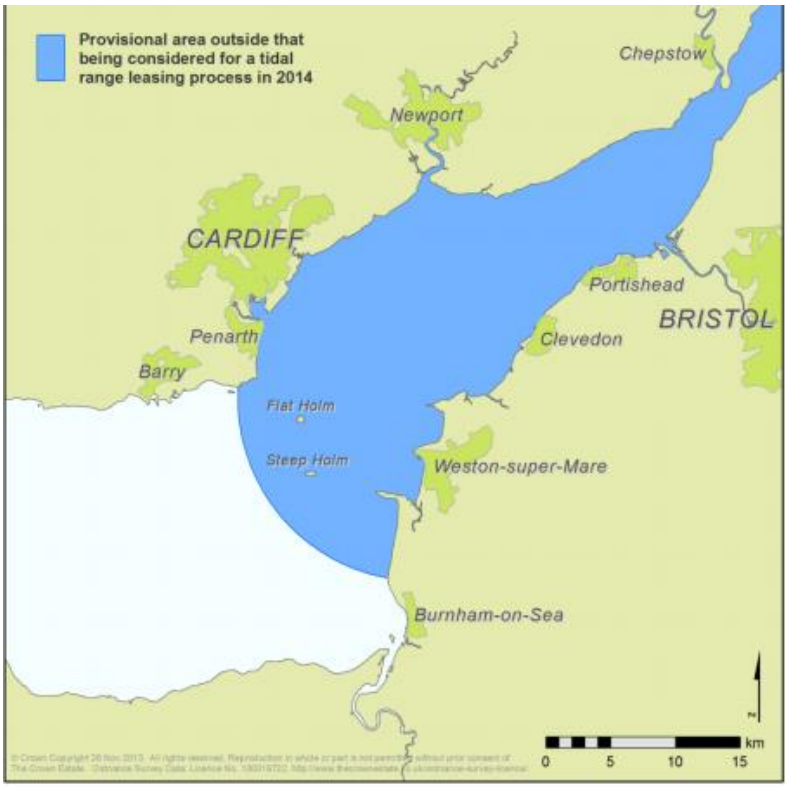

diagram 1

It is envisaged that any process is likely to be open to applications for projects in the wider Bristol Channel area.

iii. Project Generation Capacity:
We will consider running a leasing process for project proposals of up to 1GW in capacity. This upper limit is intended to accommodate commercial-scale proposals, whilst also recognising the recommendation from the ECCC inquiry report, specifically, developing smaller scale projects first, and the rationale that informed this.

iv. Competition for Sites
It is expected that project developers will want exclusive rights in relation to their project proposals, to have sufficient confidence to be able to commit the funds necessary to develop their project and secure full funding for any construction phase. Granting exclusivity to a particular location for a defined option period inevitably precludes the possibility of other competing developers using the site. As a consequence, if a leasing process is undertaken, it will be on a competitive basis and The Crown Estate will also only grant rights for proposals that are reasonably likely to progress to a point at which they are fully consented and funded in a timely manner. In practice this is likely to mean projects that have a reasonable prospect of commencing construction prior to the 31 March 2020.

v. Delivery of Construction and Capacity
Developers that are considering developing proposals that would commence construction beyond 2020 are welcome to respond to this engagement with details of their proposals. This information will support consideration of the need for a leasing process(es) after 2014/15.

III. Timeline
Government Engagement Exercise. Oct/Nov 2013 Market Engagement Exercise. Dec/Jan 2014 Evaluate market interest and align leasing process. Jan/Feb 2014 Commence stakeholder engagement and HRA as appropriate. Spring 2014 Leasing Process Spring - Summer 2014 Sign option agreements, subject to HRA. Summer - Autumn 2014
The above timeline is indicative only and is subject to market interest feedback. The Crown Estate makes no commitment to undertaking this or any process.

Following the conclusion of any leasing process for tidal range projects in 2014/15, market appetite, government support and stakeholder concerns will be evaluated with a view to considering conducting a further process in the coming years.

3. How to participate in this exercise

If your organisation would like to participate in the engagement exercise, please: □ Consider the request for project information below; and □ Respond in letter form (in English), covering the points requested. □ Letters should be e-mailed in PDF or Word format to Peter Lawrence, Tidal Range Project Manager. Hard copies are not required but are acceptable.

Deadline for responses and/or requests for clarification is; 17:00hrs on the 07/02/2014.

Peter Lawrence – Tidal Range Project Manager
The Crown Estate 16 New Burlington Place London, W1S 2HW
tidalrange@thecrownestate.co.uk Tel: 07786545543

4. Request for Project Information

Prospective developers of tidal range energy projects are invited to respond to this market engagement setting out the following: I. A summary of the project proposal setting out its name, its location (including indicative coordinates

and shape file (WGS84 or BNG). II. A brief description of the project including whether it is a barrage, shoreline-connected lagoon, offshore lagoon or dynamic tidal scheme, planned generating capacity, design life, and current consenting status. III. A plan showing target dates to i. secure statutory consents ii. enter into a grid connection agreement iii. secure revenue/capital support in the form of ROCs / CfDs etc iv. obtain full funding and reach a final investment decision v. commence construction, and vi. complete commissioning (to the extent they are known). IV. A brief description of the developer (or consortium) and its intended role in the development, construction, operation and long term ownership of the proposed project. Details of the project team and expertise in the design and build of tidal range projects. V. An outline of the broader benefits that the project could deliver, economically, socially and environmentally.

5. Request for feedback on outline scope of potential leasing process

The Crown Estate would also welcome participation in this engagement exercise by interested stakeholders who have information or interest in tidal range projects and technologies.
Interested organisations are invited to consider the potential scope of a future tidal range leasing process as set out in this paper and provide any relevant feedback, comments or information that may inform how the process is developed.

6. The Crown Estate's leasing requirements and form of rights

The following sections set out (I) what The Crown Estate is likely to require from applicants during any leasing process and (II) the basic form of rights that may be granted to successful applicants. These sections are intended to help prospective project developers to understand when they might be ready to make an application to The Crown Estate for seabed rights for a tidal range energy project, and the work that is likely to be required to succeed in such an approach. The Crown Estate is also interested to receive any comments on project specific aspects of tidal range development which ought to be reflected in any grant of rights made.

I. Leasing requirements
Applicants will need to demonstrate to The Crown Estate that they have the capacity to safely design, consent, fund, install, operate, maintain, and ultimately remove their proposed tidal range project in a reasonable timeframe. The Crown Estate will also need to evaluate the potential for spatial conflict between the proposal and any existing rights granted by The Crown Estate for other activities in close proximity to it. In practice during the leasing process applicants are likely to need to provide (inter alia) the following:

i. Project development plan (covering environment and geotechnical site surveys, design and consenting). This and the following plans will need to demonstrate a credible prospect of securing consents and funding within the exclusive option period. ii. Technology & supply chain plan (covering the selection and/or development of impoundment and generating technologies, and how and when the developer would get to the point at which a firm decision could be made regarding these, and a strategy for appointing and managing key supply chain participants). iii. Communications and external engagement plan (covering government bodies, and other key stakeholders). iv. Evidence of funding in place to complete development, and funding plan to secure funding for project construction. v. Financial support routes targeted (i.e. ROCs, CFDs, capital grant, other) including description of how the project will demonstrate compliance with eligibility criteria and timescales. vi. Evidence of existing experience and expertise, and resourcing plan to fill any gaps in this to enable delivery of project development, technology and funding plans, and strategy to resource post Final Investment Decision (FID) activities. vii. Outline business case (setting out costs, revenues, returns, capital funding breakdown and assumed costs of capital). viii. A description of the approach that would be taken to decommissioning and removing the project infrastructure, and restoring the seabed to a safe and proper condition, and an estimate of the costs of this decommissioning, removal and restoration. ix. Evidence of Health, Safety and Environmental performance, policy & strategy.

II. Basic form of rights
Rights are likely to be granted in two stages, an initial exclusive option by way of agreement for lease (AfL), that will contain within it a pre-agreed form of Lease that may be exercised within a defined option period if certain conditions are met.

The AfL will grant the rights necessary to enable a developer to carry out site and resource investigations (including the installation of temporary resource measurement devices) to support project development. The option period will be set for a reasonable period of time to allow a developer to secure consents, grid connection agreement, and funding commitments, likely to be around 5 years4 from execution of the AfL. Conditions to be met by a developer before it can exercise a Lease option will include (inter alia):

i. Compliance with the tenant's obligations under the AfL. ii. Independent report and certification of the proposed impoundment structure and generating technology. iii. Approval by The Crown Estate for the project specification and delivery plan iv. Obtaining a defined list of key project consents. v. Securing full funding and FID for the project (including any government funding arrangements and guarantees). vi. Providing acceptable financial security for the tenant's liabilities under the Lease and evidence of meeting the insurance requirements of the Lease. vii. Funding in place to enable the safe and timely decommissioning of the project from commencement of construction.
The Lease will be agreed at the point that the AfL is executed, with relevant information relating to the project (dates, spatial information etc) that has been finalised and approved by The Crown Estate during the option period being inserted when the option is exercised. The Lease will contain the rights necessary to install and operate the proposed project.

Rights relating to electricity connection to shore (for offshore projects) will be contained within the AfL and Lease, together with arrangements to be adopted if any connection to shore falls within the OFTO regime.
Fees will be payable to The Crown Estate under the AfL and Lease; details of the level of these fees are not available at this time.

7. Next steps

Following receipt of responses to this engagement and the engagement with Government bodies, consideration will be given to whether or not a leasing process for tidal range energy projects will be carried out during 2014/15, and if so, the form it will take. Any announcement regarding this will be

- The Crown Estate will not grant exclusive rights to projects that do not have a reasonable prospect of securing consents and construction funding within this timeframe to avoid developers land-banking an exclusive right that would act to prevent other proposals from being progressed in a more timely manner.
- made on The Crown Estate's website, and those interested in this should check http://www.thecrownestate.co.uk/news-media/news/ for any announcements in due course.

8. Confidentiality

"How this information will be used":
We will use the information provided to us as part of this engagement exercise to inform our strategy for tidal range leasing in the UK. It is likely that we will share summary information from the engagement with relevant government bodies and other key stakeholders, which will describe the number of potential projects within broad regional areas and the characteristics of these projects and the project developers. In recognition of its commercial sensitivity it is not our intention to disclose information that specifies either the exact location of a proposal, the developers of specific proposals, or the outline target dates for the project.

Stakeholders that choose to respond to this engagement are asked to set out whether they are happy for us to (a)

disclose their responses to relevant government bodies, or (b) publically.

In the event that respondents do not wish us to disclose information because they consider it would be commercially prejudicial to their interests, such information should be clearly identified, and the rationale for its disclosure being commercially prejudicial set out.

All respondents should be aware that The Crown Estate is subject to The Freedom of Information Act 2000 (FOIA) and Environmental Information Regulations 2004 (EIR). We will respond to enquiries made under the FOIA and EIR. Respondents therefore acknowledge that the content of their response may be disclosed in full where The Crown Estate received a relevant request for information. Whilst The Crown Estate will seek to engage with the respondent where such a request is received, this cannot be guaranteed and the decision as to the requirement for disclosure is at the sole determination of The Crown Estate

Those concerned about the disclosure of information submitted in response to this engagement should familiarise themselves with the FOIA and EIR and the relevant codes of practice and how these address communicating with those that have supplied information in relation to its potential disclosure.

For avoidance of doubt, the engagement exercise is not a leasing competition and is unrelated to any existing leasing activities that are underway. Whether companies participate or not in the exercise will have no bearing on The Crown Estate's decisions to award development rights now or in future.

No representation or warranty, express or implied, is or will be given by The Crown Estate or any of its agents or advisors with respect to the information or opinions contained in this engagement document. Any such liability or responsibility is hereby expressly disclaimed.

Under no circumstances shall The Crown Estate incur any liability in respect of decisions or actions of respondents or those reading this document, which is provided without reliance and for information purposes only. Furthermore, The Crown Estate cannot in any circumstances be held responsible for any costs incurred by any respondent which relate in any way to this document or engagement process and The Crown Estate does not owe any duty of care to any respondent in respect of matters arising in any way out of this document or engagement process.

**Appendix II: The Government Response to the House of Commons Energy and Climate Change Committee Report**

The Government set out its position in an open response the report produced on the concept of a Severn tidal energy barrage by the Select Committee on 18 September 2013. The entire contents of their response is set out below:

**Government Response to the Report of the House of Commons Energy and Climate Change Committee**

The Government welcomes the Committee's report on "A Severn barrage?" (HC 194), published on 10th June 2013.

The Government has clearly set out its position with respect to a Severn barrage. Following its extensive feasibility study of Severn Tidal Power (STP) the Government concluded in 2010 that it did not see the strategic case for public investment in a Severn barrage. It has not, however, ruled out a privately funded scheme coming forward.

The Severn estuary has great potential. However, the Government recognises that a traditional tidal barrage is not the only way of exploiting the outstanding resource of the Severn estuary.

The Government remains keen to hear about well-developed proposals for harnessing the power of the Severn estuary - be it through a barrage or other means.

However any such scheme would need to credibly demonstrate strong evidence of value for money, economic benefits, energy saving and environmental impact mitigation before the Government could take a view on its potential. It is clear from the report that the Energy and Climate Change Committee shares the Government's view on the level of development of the Hafren Power proposal. In its current form, the Hafren Power proposal for a Severn barrage does not demonstrate that it could deliver the benefits it claims it would achieve. The Government's response sets out a number of the ways in which Hafren Power would need to improve its proposal for it to merit further serious consideration.

In its report, the Committee raised a number of detailed comments and recommendations. These are considered separately below.

Transparency and public consultation

1. Robust and credible evidence is fundamental to building trust and reassuring key stakeholders, particularly for an unprecedented and huge project such as the proposed Hafren Power barrage. We support the calls for further evidence and technical detail of the proposal in order to arrive at an informed decision. We recommend that such evidence is placed in the public domain as soon as possible if stakeholder confidence is to be established and in order to promote maximum transparency. (Paragraph 16)

The Government agrees with this statement. Given the significance of a project such as a Severn barrage and the broad interest it will generate across wide stakeholder memberships, it is vital that transparency and good communication should underpin the development of any such proposal.

The Government has been pleased to see that Hafren Power have shared their full Business Case with the Committee and have published a redacted version of it on their website. The Government encourages the consortium to continue ensuring transparency and good communication with their stakeholders and the public.

2. We further recommend that Government makes clear to Hafren Power that no further consideration will be given to their proposal until and unless the additional information requested has been provided. (Paragraph 17)

The Government has made it clear to the Hafren Power consortium that it would need to see much more detailed, credible evidence of their proposal before it would consider it further. The type of information the Government would

expect to see in support of such a proposal includes:

- In-depth study of environmental impacts. This would require both baseline studies and estimation of likely effects.
- Detailed environmental compensation and mitigation plans.
- Further information on turbines including: modelling of impacts, plans to move from concept stage to commercialisation, including in-situ testing.
- Gaining commitment to the project from low head turbine manufacturers.
- Evidence to substantiate claims of how much of the proposed benefits can be delivered.
- Extensive stakeholder consultation including a clear, understandable breakdown of the level of public support the developer thinks they would need and a thorough, robust evidence base to support this.
- Analysis of impacts on upstream ports and navigation and mitigation plans.
- Detailed evidence supporting job creation figures.
- Detailed evidence of the flood impact figures.

The Government is prepared to further consider the Hafren Power proposal once this information is provided.

3. We consider Hafren Power's expected timetable for the passage of a Hybrid Bill completely unrealistic. We note that the Hybrid Bill route does not offer an open and fully accountable process for stakeholders and affected parties. An application via the Planning Act 2008 may provide a more suitable legislative vehicle for a barrage project. Clearer guidelines on due process, expected timescale and the information required by Government under different legislative routes, and particularly under a Hybrid Bill, would be helpful for both stakeholders and developers. (Paragraph 22)

The detailed process and requirements for an application under the Planning Act 2008 are set out in secondary legislation, and explained in DCLG guidance notes and advice notes issued by the National Infrastructure Division of the Planning Inspectorate. Detailed information is available from the Planning Inspectorate website.[1]

The Government would expect an application for an installation of this type to be accompanied by an Environmental Statement (ES) to comply with the Environmental Impact Assessment (EIA) Directive. A Report on Consultation, demonstrating how the proposal has taken account of the outcome of consultation, and a Habitats Regulations Assessment of the effect of the proposal on protected sites would also be required.

The expected timescale for a proposal to be consented under the Planning Act regime would be approximately 2 years for the pre-application consultation process, 9 months for application and examination, 3 months for the PINS recommendation and 3 months for the Secretary of State to determine the application. This means that the earliest a formal application under the Planning Act 2008 would be is in Summer 2015 (and, since the EIA will require detailed studies of migrating and breeding birds and fish to establish a proper baseline, which are unlikely to be able to begin until Autumn 2013, then cover the breeding season of Spring/Summer 2014, this may be optimistic). If an application was submitted by Summer 2015, we would expect it to be determined by mid Autumn 2016.

As the Minister noted in his oral and written evidence, the process for a Hybrid Bill is not specified by legislation. Before considering the introduction of a Bill, the Government would need to be persuaded, on evidence presented by Hafren Power, that the proposals would be viable. In order to reach such a conclusion, the Government would require much of the same information to that required to support an application for development consent, including evidence of the environmental impact of the proposal and of wide public engagement. It would further require satisfactory resolution of the level of Government support through Contracts for Difference (CfDs).

The Government would not expect to lay a Bill before the ES was received. Preparation of an ES is likely to take the same time as for an application under the Planning Act 2008, i.e. around 2 years, with the earliest possible completion date therefore being Summer 2015.

A slot in the legislative programme would need to be identified with Parliamentary Business Managers. It is likely that, even if time is found, this would not be before Autumn/Winter 2015, at the earliest. Depending on the complexity of the Bill (which is likely to need to cover, as a minimum, the same issues as a Development Consent Order under the Planning Act 2008, including all the relevant deemed planning permissions and other licences) it could take longer.

As noted in the report, there have been very few similar Bills to act as indicators of how long it might take for the Bill to complete the Parliamentary process. This would likely be at least a year, but it could extend to three or four years. This would indicate a time frame for Royal Assent, if such a Bill was introduced and enacted, between early 2017 and 2020.

Costs and value for money

4. We recommend that Government ensure that levelised cost of energy analysis reflects a fair appraisal of long-term cost and power generation, which takes into account the full lifecycle of marine energy projects. (Paragraph 28)

The Department of Energy and Climate Change employs a flexible approach in calculating generation costs for Tidal Range projects, reflecting the uncertainty in this emerging technology. DECC's Electricity Generation Cost publication[2] draws on the Ernst & Young/Black & Veatch approach[3]. This assumes a 40 year financial life in levelised cost of energy calculations, despite project lifetimes potentially exceeding this. Ernst & Young / Black & Veatch cite uncertainty in policy frameworks supporting generation over longer lifetimes, discounted cashflows making minimal impact past 40 years, and unknown timing and costs of project refits that may be required sometime after 40 years. This methodology is used to provide an illustrative estimate of levelised cost of energy for the tidal range (barrage) industry.

DECC's latest estimates of levelised cost of energy for the Severn Barrage[4] were calculated on a project lifetime basis, reflecting the availability of information on a project basis to enable this approach.

This flexibility in methodology when looking at both illustrative and project specific cost estimates for tidal range projects will continue to be reflected in DECC's approach.

5. We believe that the strike price for the barrage would have to be considerably higher than the £100/MWh which Hafren Power have "in mind". Furthermore, the company say they would require this price to be guaranteed for 30 years, twice as long as an offshore wind project. It is unsatisfactory that such wide-ranging figures have been cited regarding the level of Government support required for a barrage. As a minimum, the strike price for barrage-generated electricity should not be higher than that for offshore wind, which is expected to be around £100/MWh by 2020. While the use of novel turbines and updated design may indeed provide savings in barrage construction, it is very unlikely that the Hafren project will be financially viable with a strike price at this level. If a higher strike price was offered, it would risk swamping the Levy Control Framework to the detriment of other low-carbon technologies. Claims by Hafren Power of long-term affordability are too distant and uncertain a prospect to overcome more immediate economic, environmental and local concerns. (Paragraph 34)

It is not for Government to comment on what level of revenue support would make a privately funded project economically viable. Without further detailed evidence on the design of the project it is difficult to assess whether Hafren Power claims of the strike price they may require can be substantiated.

As part of its June announcement, the Government stated that is was not intending to set a strike price for tidal range projects for the first Electricity Market Reform delivery plan period running to March 2019. This is due to the lack of cost data available for tidal range projects, including a potential Severn barrage. Instead, Government will consider how best to price CfDs and the appropriate length of contracts for tidal range projects, on a case-by-case basis.

In any case, the relative value for money of a Severn Barrage would need to be assessed alongside other low carbon

generation competing for funding in the Levy Control Framework (LCF).

6. We do not believe that potential collateral benefits should be factored into any strike price negotiations. In the case of the Hafren scheme, significant uncertainty remains regarding whether such savings would in fact be made, and there is a lack of consensus regarding the impact of a barrage on flooding. The support available via Contracts for Difference comes directly from consumers via their energy bills. Any flood defence savings made as a result of projects supported will not accrue to bill payers but to the Exchequer. We recommend that the savings from any potential reductions in Government spending are disregarded when negotiating strike price. (Paragraph 37)

The strike price is set on the basis of the cost of building and operating specific technologies or generation assets in order to meet Government electricity objectives. It does not include secondary or collateral costs/benefits which might arise from a project such as potential flood savings. On that basis, we would not take into account flood savings or any other collateral costs/benefits in setting a strike price for the barrage.

7. While we do not share these concerns regarding foreign investment, and indeed welcome investment in renewable projects from private sources, all efforts should be made to ensure maximum UK content if the project is taken forward. (Paragraph 38)

The Government agrees with this statement. We welcome foreign investment in UK energy and infrastructure projects. However it is clearly desirable that these investments come with a high UK content and creation of UK growth and jobs.

Given the current level of detail of the proposal it is difficult to assess the validity of Hafren Power's claim that 80% of the investment in their project would remain in the UK.

8. The Committee notes that the current mechanisms to support large renewable projects are limited in scope, and that support under CfDs will be limited by the Levy Control Framework. While private finance offers a welcome boost to infrastructure investment, particularly during the economic downturn, projects will inevitably need to provide an attractive return to investors and the future cost of such finance remains uncertain. We are not convinced that Hafren will be able to raise the funds needed for their project as easily and cheaply as they claim. (Paragraph 41)

To date, Hafren power have not presented the Government with compelling evidence of their likelihood of raising the necessary levels of finance for such a project.

9. Hafren Power's proposals will require massive support under the Contract for Difference (CfD) mechanism and for a much longer period than alternative low-carbon technologies. Currently it is unclear whether the company's proposal would be eligible for such support since it has yet to prove value for money compared with other low-carbon sources. Until the company is able to provide stronger evidence of interest from investors and of the basis for its claimed costings, the economic viability of the project will be in doubt. (Paragraph 42)

The Government agrees that without further evidence it is not possible to assess the economic viability of the project nor the level at which it should be supported. We refer the Committee to our answer to paragraph 34 above.

Environmental impacts and mitigation

10. We conclude that the environmental impacts of the Hafren Power barrage, as currently presented to us, are very considerable and that there is a high risk of unintended and possibly damaging consequences. We also conclude that Hafren Power has not presented sufficient credible evidence relating to estuary morphology, impacts to habitats and upstream fluvial flood risk. Further data, research and modelling will be required before impacts in these areas can be assessed with any degree of certainty. (Paragraph 50)

11. We therefore conclude that the usefulness of international comparator sites is limited as a result of differences in estuary characteristics and scheme designs. (Paragraph 53)

12. We note that the Environment Agency claims that it is "not aware of any turbine designs which would allow the safe, repeated passage of fish through a barrage at the scale proposed." While claims that a barrage would lead to very extensive fish mortality may be exaggerated, existing figures of low level fish mortality tend to derive from a single species and do not encompass the diversity of species found in estuaries. Studies have largely focused on only direct mortality. However initial studies on indirect mortality suggest it may constitute a significant source of overall mortality. Field testing a prototype in an estuary on a range of fish species and sizes will need to be carried out before the claimed "fish-friendliness" of Hafren Power's proposed turbine can be determined. (Paragraph 57)

The Government agrees with the above comments. It is for the developers to do the necessary work to prove that their design is 'fish-friendly' and will not jeopardise the UK's obligations under the Water Framework Directive and Habitats Directive. Such studies will need to take account of the wide variation in vulnerability of different fish species arising from to their different morphology, physiology and behaviour.

13. Before giving further consideration to the project, the Government should establish greater clarity in the terms and application of the Habitats Directive to major renewable infrastructure projects, in particular regarding the derogation process and principle of 'Imperative Reasons of Overriding Public Interest' (IROPI). (Paragraph 67)

Compliance with the Habitats Directive must be judged on a case-by-case basis as the impacts of a project can vary considerably between similar projects depending on factors such as their scale, location and the exact technology used. It is therefore hard to provide detailed clarity on how the Directive would apply to what is still a hypothetical, very high level proposal. We would expect the European Commission to ask for much more detailed proposals before discussing the detailed application of the Directive in respect of issues such as 'like for like' compensation.

The Government is however committed to making its general guidance on the Directive clearer and the IROPI principle is the subject of published DEFRA guidance[5], including advice on how and when the IROPI test should be applied. This sets out that 'plans and projects which enact or are consistent with national strategic plans or policies (e.g. covered by or consistent with a National Policy Statement or identified within the National Infrastructure Plan) are more likely to show a high level of public interest.' Renewable energy projects are therefore likely to show a high level of public interest given EU level targets and the duties set out in the Climate Change Act. However this does not mean all renewable projects can automatically go ahead. The developer also needs to be able to show there are no alternative solutions and that they have secured compensation that will maintain the integrity of the Natura 2000 network.

14. Serious questions remain about the effectiveness and feasibility of providing compensatory habitat on the scale required for the proposed Hafren Power barrage scheme. While optimisation of barrage design and operation offer possibilities for mitigation, the requirements of the EU Habitats Directive are a significant challenge. We note that smaller scale projects may face fewer obstacles in achieving compliance with European legislation. (Paragraph 73)

The Government agrees - but given the sensitive and highly protected environment of the Severn Estuary, any project may face insurmountable obstacles unless IROPI can be clearly demonstrated.

15. We appreciate the financial outlay implied in, for example, developing a full Environmental Impact Assessment of the proposed project. But it is clear that such a largescale, high risk and high cost project cannot go ahead in a designated area without supporting evidence and assessments in place. Without such evidence the project will not achieve political and public acceptability. (Paragraph 74)

The Government agrees.

Socio-economic impacts

16. The Hafren Power barrage scheme could offer significant benefits for the UK in terms of jobs and growth, with the potential to reinvigorate the local economy. A tidal barrage on this scale would highlight the UK's engineering capabilities in the construction of large-scale renewable projects. (Paragraph 79)

The Government's STP feasibility study concluded that a barrage could benefit the regional economy with net value added to the economy and jobs created. However, these would have to be balanced with potential negative impacts on the current ports, fishing and aggregate extraction industries in the estuary.

The net regional benefits represented in the STP study varied greatly (with construction jobs ranging from +5,300 to -2,200 (with a central estimate of +440 jobs) and GVA from £5.9bn to £1.5bn (with a central estimate of £2.1bn)).

Benefits and impacts from the current proposal would differ depending on the specific features of the proposal including adequate provision for sea-locks as well as location and scale of manufacturing, supply chain etc. It is difficult to assess what the job and economic impact of the Hafren Power proposal will be in practice, not having seen detailed evidence behind their headline figures.

Whilst a project of this scale could highlight UK engineering capability, it is worth noting that the actual export potential for such a project are likely to be limited, given the maturity of the technology and the small number of sites around the world with the combination of features to make a tidal barrage viable.

17. Hafren Power has failed to reassure the ports industry that its business would continue to be viable with a barrage in place. Serious questions remain in regard to the barrage's impact on water levels, shipping times, freight costs and siltation. These will need to be fully addressed before impacts to the ports can be accurately evaluated. (Paragraph 86)

The Government agrees with this observation. Each of the issues identified, even taken alone, could have very serious implications for the ports on either side of the Channel and estuary upstream from the proposed Barrage. The ports also identified the prospect of ship congestion at the lock system as a potentially serious deterrent to the choice of these ports by ship operators.

18. We therefore recommend that any claims about job creation and economic benefit should be independently verified, particularly with reference to the costs being borne by energy users, with adverse impacts to existing industries factored in to calculations in order to provide a robust assessment of net regional economic impact. The employment benefit of a barrage scheme is likely to centre around temporary jobs during construction. The number of high-quality, permanent jobs created by the proposals will be ultimately more significant. (Paragraph 90)

The Government agrees that detailed evidence needs to be provided to back up the Hafren Power proposal's headline figures on jobs and economic benefits and that these should be independently verified. These figures are unlikely to be refined until greater clarity is provided on the actual design of the scheme including, for example, on:

- choice of turbine manufacturer;
- details on turbine operations;
- details on manufacturing and supply chain;
- adequate provision of locks and other measures to mitigate impacts on ports.

Decarbonisation and energy security benefits

19. We accept that a tidal barrage scheme in the Severn estuary could provide a reliable and predictable low-carbon electricity supply, which could bring benefits for energy security. Technological innovations such as smart grids, interconnection and electricity storage could help to overcome the challenges associated with tidal energy. (Paragraph 95)

20. We note the disparities in these carbon savings assessments and the need to take into account a carbon payback period. Carbon reduction offered by a barrage would nonetheless be considerable. (Paragraph 96)

21. We conclude that the Hafren Power project in its current form has not demonstrated sufficient value as a low-carbon energy source to override regional and environmental concerns. We agree with the Minister that, at present, the barrage is not vital to meeting our 2050 carbon targets, for which alternative pathways exist. On the basis of the evidence available, we further conclude that the same or similar policy objectives could be delivered through less environmentally damaging means and possibly at lower cost. (Paragraph 99)

Government recognises the strong energy and climate change benefits that a Severn Barrage could bring. It has summarised these in our written evidence to the Committee. However these cannot come at any cost. The Government agrees with the Committee that the Hafren Power proposal in its current form does not credibly demonstrate sufficient mitigation of the environmental and regional economic impacts. Nor does it demonstrate sufficiently good value for money for the consumers.

There are many ways in which the UK could meet its decarbonisation targets. The focus is on technologies which can allow us to meet these targets whilst balancing environmental impact mitigation, economic benefits and value for money for the consumer.

Barrage technology and alternatives

22. Although Hafren Power has assured the Committee that it has included time for turbine testing and development in the project timescale, we doubt that the two years proposed will allow sufficient time for production of a novel turbine as well as the necessary independent verification and trials. (Paragraph 103)

The Government agrees with this statement. It is our understanding from discussion with technology developers that such a novel turbine would take about 5-10 years to be developed, verified and tested.

23. We conclude that a more incremental approach using alternative technologies (such as tidal lagoons) may have the potential to provide a lower-risk, lower-impact option than the Hafren Power barrage scheme. Whether these alternatives offer better value for money is far from clear at this stage. Any alternative proposals to the Hafren Power scheme would need to demonstrate the same robust evidence about the costs, environmental and socioeconomic impacts which we require for the Hafren Power scheme. We recommend consideration is given to first developing a smaller scale tidal project, in order to build a stronger evidence base for assessing impacts, risks and costs before proceeding with any larger scale scheme. The Government should take this into consideration before approving the development of projects in the Severn estuary. (Paragraph 114)

The Government agrees with this approach in principle. A smaller-scale tidal range scheme could in particular provide important information on the operation of the innovative turbines, which Hafren Power proposes to use. It is worth noting, however, that, given the considerable scale of a CardiffWeston type barrage and the unique environment of the Severn Estuary, a smaller-scale tidal range project would not necessarily provide wider evidence readily comparable to the type of impacts from a larger scheme.

Smaller schemes, including tidal lagoons, are still likely to be challenging and to have high capital costs. As set out by the Committee, smaller schemes would also need to demonstrate strong evidence of value for money, economic benefits, carbon saving and environmental impact mitigation.

24. We conclude that the Government should continue to examine the energy generating potential of the Severn region in the event of Hafren Power's proposed barrage scheme not going ahead. We therefore recommend that the Government consider how a more proactive approach to Severn resource management could stimulate growth in the

marine renewables industry and drive forward tidal projects in the region. (Paragraph 116)

There is a huge amount of potential energy in the Bristol Channel and it is only right that the Government should be seeking the best ways of extracting it. The Government's STP study took an in-depth look at a number of tidal range options for the Severn estuary.

The Government welcomed the RegenSW report on a balanced technology approach in the Bristol Channel. The RegenSW report goes some way in looking at the possible combinations of renewable energy projects in the Bristol Channel to make best use of its resource whilst considering environmental impacts and regional industry concerns. Until concrete proposals are put forward by developers, the Government doesn't see a strategic case for funding further studies to examine the potential of the region at the expense of the tax payers. The Government sees the RegenSW report as a useful framework against which developers can best consider the appropriate use of resources in the Bristol Channel.

However, as many of these technologies are still emerging or not cost competitive, it is not appropriate for Government to take a directive approach. The Government sees this role as most effectively achieved by the market. It is not for Government to be directive over which technology solutions should be adopted by developers at the outset.

The Government has set out the broad agenda for the renewable energy mix it wants to see to the 2020s and beyond. We are putting in place a framework for efficient support mechanism through the Electricity Market Reform.
The Government is also fully committed to the development of a UK wave and tidal stream industry. To date, it has provided sustained and targeted support for the development of the sector enabling it to move from initial concept onto prototypes and now looking to support the first arrays. The support package is comprehensive and larger than anywhere else in the world. In this spending period alone £80m of public money will have been invested in the sector. This has allowed the UK to maintain its standing as "the destination" for marine energy.

The Government strongly believes that these energy policies taken together will create an environment allowing winners to emerge naturally.

However, it is vital that any proposal or set of proposals demonstrate compellingly that they are viable, good value for money for the consumer and environmentally responsible.

1 http://infrastructure.planningportal.gov.uk/application-process/the-process/
2 https://www.gov.uk/government/organisations/department-of-energy-climatechange/series/energy-generation-cost-projections
3 http://webarchive.nationalarchives.gov.uk/20121205174605/http:/decc.gov.uk/assets/decc/what%20we%20do/uk%20energy%20supply/energy%20mix/renewable%20energy/explained/wave_tidal/7 98-cost-of-and-finacial-support-for-wave-tidal-strea.pdf
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