



National Infrastructure Commission
1 Horse Guards Road
London
SW1A 2HQ

8 January 2016

National Infrastructure Commission: call for evidence – delivering future-proof energy infrastructure

Dear Sirs/Madams,

Tidal Lagoon Power is driving a critical change in the UK's energy mix with the development of low cost, low carbon electricity sources that are sustainable, UK based and deliver long-term energy security for 120 years.

Overview

- Tidal lagoons offer low carbon, sustainable energy generation from a domestic technology with significant UK value and global export potential.
- Tidal lagoons deliver reliable, long-term predictable renewable energy to the UK System allowing balancing requirements to be identified well in advance.
- Tidal lagoons offer a source of low carbon energy without the inherent imbalance risk associated with other intermittent generators such as wind and solar.
- Tidal Lagoon Power is discussing with National Grid how to realise and optimise the benefit to the System from a portfolio of UK based tidal lagoons.
- Barriers such as current regulation and market structure mean that there is not at present a clear identifiable pathway for developing the system management potential of tidal lagoons.
- Tidal Lagoon Power welcome further engagement and discussion with the National Infrastructure Commission.

Introduction

Tidal lagoons represent affordable and sustainable infrastructure that can:

- generate domestic, low carbon electricity at scale;
- create long term UK employment;
- catalyse a long term UK hydroelectricity manufacturing and engineering industry;
- promote biodiversity;
- promote local community resilience and pride; and
- allow UK institutions and the general public to invest in and take long term ownership of our natural power assets.



Our first project, Tidal Lagoon Swansea Bay, establishes a scalable blueprint for our programme. Beyond this, we aim to develop, construct and operate a fleet of tidal lagoons to meet up to 8% of UK electricity demand - a significant contribution to the economy and to the decarbonisation of the energy sector. A report by CEBR¹ found that a fleet of 6 lagoons in the UK could contribute £27 billion to UK GDP, creating or sustaining 35,800 jobs on average and 70,900 jobs at its peak. Once operational, 6 tidal lagoons would contribute £3.1 billion per annum to UK GDP, creating or sustaining as many as 6,400 full time equivalent long term jobs. Also, because of the significant export potential, CEBR also reported that there was a potential to increase net exports by £3.7 billion per year (equivalent to 13% of the current trade deficit).

Smart infrastructure for a smarter energy future

Tidal lagoons are an innovative composition of the best established engineering, technology and development approaches, designed to generate predictable renewable energy for 120 years. Our main focus at this stage is to finalise the agreements necessary to start construction to deliver the Tidal Lagoon Swansea Bay project. This project will demonstrate innovative first of kind renewable energy technology, and unlock the potential for larger tidal lagoons in future.

A future portfolio of larger tidal lagoons will contribute domestic low carbon electricity at scale to the System. We also have an ambition to further understand the potential for a portfolio of tidal lagoons to provide flexibility and dynamic dispatching of power to the System.

We are engaged with National Grid to explore the potential ability of a future portfolio of tidal lagoons to provide solutions to current and emerging challenges to the Transmission System. Whilst one of the key characteristics of tidal lagoons (of relevance to system management) is their long-term predictability (a unique feature amongst renewable sources of energy), they also inherently involve a significant element of control and flexibility in their dispatch, attributes which have most potential through the development of a portfolio of larger future lagoons.

Tidal lagoons also have the capability to pump, thereby consuming energy (as well as the ability to generate). This capability could prove highly useful to system balancing needs in times of stress. The dual capability of future large tidal lagoons as a generator and a load, coupled with the ability to modulate the power level in both these operational modes (through the deployment of variable speed drives) is an attractive system management

¹ 'The Economic Case for a UK Tidal Lagoon Industry', Centre for Economics and Business Research, July 2014.



opportunity. As a fleet, tidal lagoons present a portfolio of highly predictable energy generation close to population centres, with the possibility of portfolio-wide frequency response, synthetic inertia and load.

There are barriers, including current regulation and market structure, which mean that there is not at present a clear identifiable pathway for developing the system management potential of tidal lagoons.

The key barriers preventing the realisation of benefits to the System from future tidal lagoons relate to current procurement approaches by National Grid, such as flexibility, and term of contracts and services. Current contracting requires fairly rigid availability windows (variable only between weekdays and weekends), which impedes the participation of tidal lagoons because operational parameters are largely governed by a tidal cycle (known long in advance). A move towards more flexible contracting designed around technology capability would be a welcome change.

Also, the maximum contract term for ancillary services is currently 2 years. If ancillary services become a key part of the suite of benefits offered by tidal lagoon technology, longer term contracts would be required in order to develop and finance this operational capability.

TLP would welcome the opportunity to discuss these barriers in further detail directly with the National Infrastructure Commission. We are keen to engage with work focused on future proofing the UK's electricity System as we believe that changes can be made to help realise the potential for tidal lagoons to offer system management capability in addition to significant low carbon electricity generation.

If you have any queries, or wish to discuss further, please contact me at [\[email address redacted\]](#) or [phone number redacted].

Yours faithfully,

Catrin Jones

Policy Manager

Tidal Lagoon Power