Appendix 7.5

Preferred option and the PEIR – presentation to statutory consultees and key stakeholders

Tidal Lagoon Swansea Bay

Project introduction/update – formal consultation
July 2013

1

Energy & emissions context

UK energy sources (2011) – 88% fossil fuels, 8% nuclear, 4% renewables. 43% imported
- Only Malta and Luxembourg produce less renewable energy in Europe
- CEO of Ofgem predicts UK 'energy crunch' & black-outs by 2017 as power plants expire faster than they are built, nuclear build program falters, and fossil fuel prices rise (Feb '13)

Climate Change Act 2008 – 80% reduction in carbon dioxide emissions by 2050
- 25% reduction in energy consumption
- Transition of energy for transport and heat from fossil fuels to low carbon sources
- 100% increase in electricity generation

EU Renewables Directive 2009 – 15% of UK energy needs from renewables by 2020
- Equates to 30% of renewable electricity
- Requires investment in 30GW of renewable energy capacity
- Also requires substantial investment in gas to provide back-up

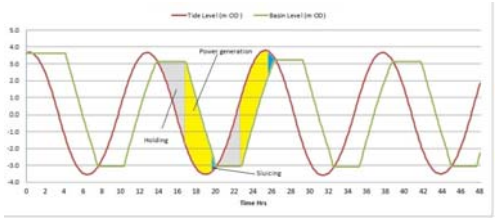
2

UK tidal energy resource

- Island nation with largely un-tapped marine energy resource – best in Europe
- Tidal lagoons require:
  - Shallow water
  - Large tidal range
- Difference in high tide times around the UK creates potential to produce 24-hour base-load renewable electricity from a network of lagoons
- Essential part of energy mix and a new, exportable industry

3

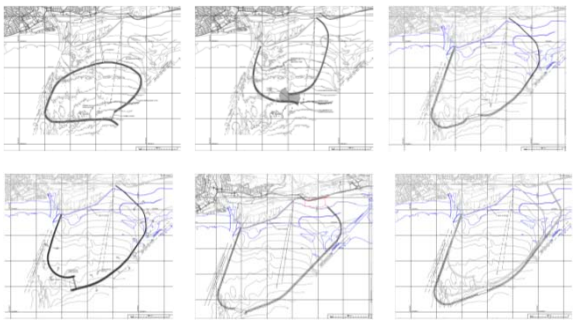
Typical 48-hr lagoon operating cycle



- 48-hour sequence shows holding, sluicing & (avg. 14-hr per day) power generation periods for single lagoon with 16 turbines and 10 sluice gates
- Second & subsequent lagoon cycles would be staggered, combining to provide 24-hour base-load power

4

Summary of 14 lagoon options considered



5

Swansea Bay Tidal Lagoon, Oct 2012

Design as submitted to PINS for EIA Scoping, Oct 2012

Wall length	9.5km
Area	9.4km^2
Installed capacity	250MW
Annual output (gross)	400GWh
Design life	50-100yrs
Height of wall	11-19m
Wall above low water	11.3m
Wall above high water	2.8m
Tidal range Neaps	4.1m
Tidal range Springs	8.5m

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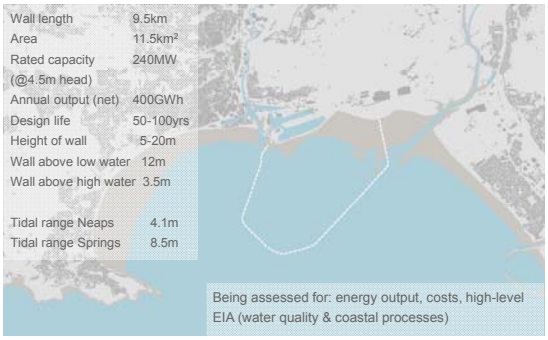
Current preferred option under review

Wall length	9.5km
Area	11.5km²
Rated capacity (@4.5m head)	240MW
Annual output (net)	400GWh
Design life	50-100yrs
Height of wall	5-20m
Wall above low water	12m
Wall above high water	3.5m
Tidal range Neaps	4.1m
Tidal range Springs	8.5m



Being assessed for: energy output, costs, high-level EIA (water quality & coastal processes)

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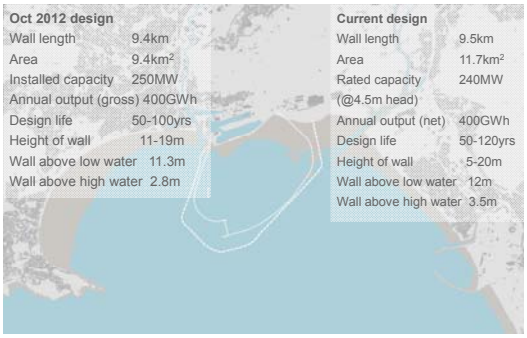
Design comparison

Oct 2012 design	
Wall length	9.4km
Area	9.4km²
Installed capacity	250MW
Annual output (gross)	400GWh
Design life	50-100yrs
Height of wall	11-19m
Wall above low water	11.3m
Wall above high water	2.8m

Current design	
Wall length	9.5km
Area	11.7km²
Rated capacity (@4.5m head)	240MW
Annual output (net)	400GWh
Design life	50-120yrs
Height of wall	5-20m
Wall above low water	12m
Wall above high water	3.5m



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Ongoing EIA, viability & design refinement

18 months of development work suggests Swansea Bay offers great potential for lagoon construction. Key ongoing work streams:

- **EIA** – scope agreed with regulators, EIA now underway, with collaborative input from statutory consultees (including NRW and LPAs). PEIR published 4 July.
- **Hydrodynamic modelling** – multiple lagoon shapes/sizes tested for water quality, sediment transport and sand erosion/deposition impacts
- **Value engineering** – reduce cost of sea wall, turbine housing, construction methods
- **Turbine design** – leading manufacturers Voith/Alstom/GE refining specifications for low-head bulb turbines
- **Grid** – pre-application discussions with National Grid & Western Power Distribution to identify likely grid connection, network capacity and timescales
- **Leasing & consents** – engagement with landowners including The Crown Estate, ABP Swansea, Swansea University, St Modwen
- **Onshore masterplanning** – maximising onshore opportunities with ABP & University

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Environmental Impact Assessment

Comprehensive assessment of impacts, from construction to decommissioning, and including cumulative impacts from other proposed development and activities

- Coastal processes, sediment transport & contamination
- Marine water quality
- Intertidal & sub-tidal benthic ecology
- Fish, recreational & commercial fisheries
- Marine mammals
- Coastal birds
- Navigation & marine transport
- Terrestrial ecology
- Seascape & visual amenity impact
- Onshore transport & air quality
- Economy, tourism & recreation
- Marine & terrestrial noise
- Archaeology & historic landscape
- Flood risk
- Land quality
- Habitat regulation assessment
- Water Framework Directive assessment

EIA scoping report submitted to PINS:	*Oct 2012*
EIA scoping response received:	*Nov 2012*
Baseline reviews:	*Q1 2013*
Preliminary Environmental Impact Report ready:	*4 July 2013*

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Planning context

Planning Act 2008
- +100MW offshore lagoon = Nationally Significant Infrastructure Project
- Application to Planning Inspectorate (PINS) for decision by Sec. of State for Energy
- Development Consent Order (DCO) combines previous separate consent procedures
- DCO will comprise: lagoon structure, onshore grid connection, supporting development

Marine and Coastal Access Act 2009
- Marine license required for construction and dredging in Welsh waters
- Issued by Welsh Govt. Marine Licensing Team (MLT)
- PINS and MLT cooperate; processes run in parallel

Town & Country Planning Act 1990
- Apply to Swansea/NPT Councils for elements outside the NSIP above Mean Low Water, e.g. bio-fuels facility

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NSIP planning process – 6 key stages

1. Pre-application – front-loaded consultation phase
   - Informal – "issues and options", autumn 2011 to June 2013
   - Formal – "preferred option", 4 July to 5 August 2013
2. Submit application, EIA and consultation report – Oct 2013, 28 days for PINS to accept
3. Pre-examination – 3 months: publicity, registration, preliminary public meeting
4. Examination – 6 months: reps, hearings, Local Impact Reports from LPAs
5. Recommendation & decision – 3 months for PINS, 3 months for SofS
6. Post-decision – 6-week period for legal challenge

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Consultation phasing

"To manage the tension between consulting early, but also having project proposals that are firm enough to enable consultees to comment, applicants are encouraged to consider an iterative, phased consultation consisting of two (or more) stages… Applicants might wish to consider undertaking informal early consultation at a stage where options are still being considered. This will be helpful in informing proposals and assisting the applicant in establishing a preferred option on which to undertake formal statutory public consultation." DCLG Pre-App. Guidance, Para 52.

- **Phase 1, informal consultation (s42 & s47 groups): 'Issues and Options'**
  - Phase 1a (basic project intro): autumn 2011 to February 2013
  - Phase 1b (refined project intro/design): March to July 2013
- **Phase 2, formal consultation, s42 & s47: 'Preferred Option and the PEIR'**
  - Approach agreed with LPAs & set out in Statement of Community Consultation
  - 4 July to 5 August 2013

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Informal public consultation: April 2013

Event	Swansea Civic Centre	Mumbles, Ostreme Centre	Port Talbot, Princess Royal Theatre	TOTALS
Date	11 April, 10am-6pm	16-17 April, 12-6pm each	18 April, 10am-6pm	~
Attendance	197	176	58	**431**
Feedback forms	77	93	32	**202**
In favour / undecided / opposed	71 / 6 / 0	78 / 14 / 0	25 / 7 / 0	**174 / 27 / 0**

- Common concerns as summarised, more info on EIA preferred
- Over 80% of attendees rated the event (useful/informative) as 8/10 or above

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Informal consultation – issues/response

KEY ISSUE	RESPONSE
Coastal processes/sediment transport – impact on beaches in the Bay and further afield	EIA / iterative design process to minimise impact – e.g. changes to lagoon shape
Ecology – impact on fish, birds, marine mammals, other marine organisms	EIA / iterative design process to minimise impact – e.g. fish-friendly turbine design
Water quality – impact on designated bathing beaches, shellfish areas, other water uses	EIA / iterative design process to minimise impact – e.g. provision of storm water treatment
Visual impact	Increase no. of CGI views in EIA (LVIA)
Energy – how much energy, and when?	Energy optimisation studies / iterative design process to maximise energy production – e.g. changes to lagoon size/shape, number/size of turbines

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Informal consultation – issues/response

KEY ISSUE	RESPONSE
Navigation – impact on large & small vessels	EIA / consultation with port owners & users / iterative design process to minimise impact – e.g. changes to lagoon shape
Traffic & transportation – during construction, operation, events	EIA and masterplanning study. Aim to maximise use of rail/sea transport during construction
Planning – the process by which consent will be sought	Provision to include description in consultation materials
Deliverability – will it ever happen?	Provision to include company background, consultants' credentials, & project finance info in consultation materials

While a wide range of issues have been raised by stakeholders and the public, the balance of responses has been very positive.

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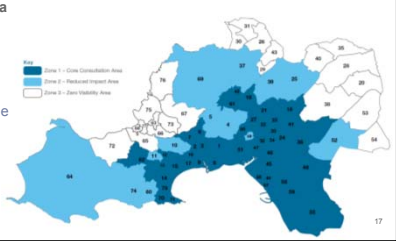
Formal consultation – zoning

- **Zone 1, core consultation area** – seafront & other wards with significant visibility – focus of all communications, mailing & questionnaire to all addresses, events etc
- **Zone 2, reduced impact area** – wards with limited visibility – mailing & questionnaire to all addresses, attendance at Zone 1 events promoted
- **Zone 3, zero visibility area** – mass media/public relations & letters to Community Councils to promote participation, online response, & attendance at Zone 1 events



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Formal consultation – materials & events

- PEIR and Non-Technical Summary published 4 July, sent to +100 statutory consultees – follow-up meetings arranged as required
- s48 notice of consultation published in local & national press, from 26 June
- SoCC published (SWEPost & Western Mail), 26 June
- Project website fully updated, PEIR & NTS published, online questionnaire, from 4 July
- Local poster campaign from 20 June, local radio campaign (260 spots) from 1 to 26 July
- SoCC & questionnaire mailed to 180k addresses in zones 1 and 2
- 18x staffed public consultation events in 16 locations around the Bay, 5 to 31 July
- 3x un-manned displays in Bay area, from 4-17 July and 4-31 July
- 10x deposit locations around the Bay holding PEIR & NTS for public review
- On-going meetings with multiple local stakeholders, community councils etc
- **Deadline for responses: 5 August**

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Masterplanning/landscape concepts

- Visitor facilities, sports, recreation, arts/culture and mariculture
- Improved connections across Swansea Docks from SA1 to new Uni SAIC along 3.5km waterfront
- 4 new 'marine parks', new habitats created
- 3 main buildings, at least one bridge (plus series of smaller structures TBC)

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Landscape concepts – 4 marine parks

The lagoon provides a unique opportunity to establish 'marine parks' where new buildings and public spaces respond to their surroundings both on and offshore

Landward Urban Park – at western landfall

Landward Ecological Park – at eastern landfall

Broad Seaward Park – western seawall to turbine housing/offshore buildings

Narrow Seaward Park – turbine housing eastwards

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Landscape concepts – 4 marine parks

Landward Urban Park – at western landfall

- Main entrance to the lagoon from the land, including opportunities for recreation, sport and play, attracting a diverse range of people & creating a lively atmosphere
- Wide promenades, terraced platforms, a beach front, play spaces, attractive lighting, stretches of waterside parkland, trees and decking
- Access for boating associated with the Western Landfall Building(s)

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Landward Urban Park CGI

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Landscape concepts – 4 marine parks

Landward Ecological Park – at eastern landfall

- Natural edge to the north-eastern section of the lagoon abutting Crymlyn Burrows
- New wildlife habitats (grasslands, saltmarsh, sand dunes) linked to the SSSI, a beachfront to the University SAIC and opportunities for mariculture production
- Timber boardwalks, informal paths, wild grasses, natural landforms and mariculture allotments

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Landscape concepts – 4 marine parks

Broad Seaward Park – western seawall to turbine housing/offshore buildings

- Offering visitors a choice of cycle & pedestrian routes with opportunities for upper and lower level tide routes, straight and sinuous
- Typically hard landscape, with crisp concrete edges, cantilevered decks, sinuous walkway structures extending from the seawall, spectator seating, viewing platforms and access to the water's edge

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Broad Seaward Park CGI

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Landscape concepts – 4 marine parks

Narrow Seaward Park – turbine housing eastwards

- Extending along the most remote sections of the seawall, including the furthest point from land & the deepest waters of the lagoon
- Functional character with a hard, engineered landscape
- Typical features include patterned concrete, rock armour, follies & fishing platforms

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Western Landfall Building concept

- Onshore Operations & Maintenance (O&M) and emergency facilities
- Boating centre PLUS: arrival/orientation/other facilities for visitors

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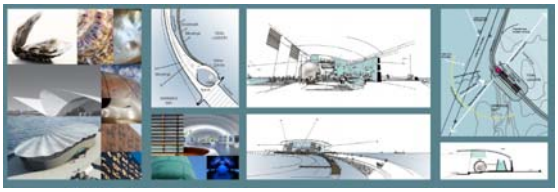
Offshore Building concept – 'the Oyster'



- Offshore Operations & Maintenance (O&M) and emergency facilities
- Turbine visitor centre, exhibition centre, café, 360 views
- Visitors able to enter turbine housing from here

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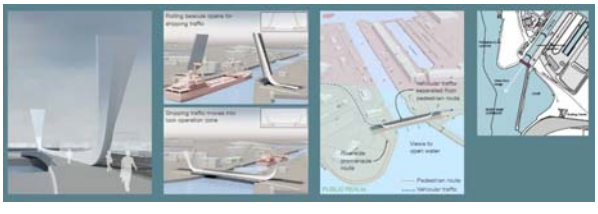
King's Lock bridge concept



- Double-leaf "rolling bascule" bridge, energy efficient opening mechanism
- Works with existing lock, no constraints for shipping access, minimum time open
- Pedestrians/cycles separated from Port traffic

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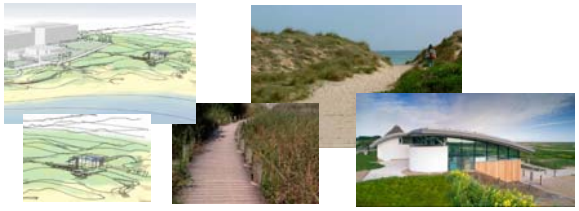
Eastern Landfall Building concept



- Seawall access control, onshore O&M facilities (as required) & info facility related to Crymlyn Burrows SSSI and the lagoon
- Single-storey building on proposed dune & grassland between SAIC & seawall
- Natural form echoing the dune system, views through and from the building

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TLSB programme – pre-application phase

• Notify the Secretary of State of the proposed application	Oct 2012
• Confirm requirement for (and scope of) Environmental Impact Assessment	Oct 2012
• Environmental Impact Assessment underway from	Nov 2012
• Consult Swansea/NPT Councils on consultation methods	Mar/Apr '13
• Publish SoCC and s48 notice	26 June
• Preliminary Environmental Information Report (PEIR) complete	4 July
• Formal public consultation events (based on PEIR)	4 Jul - 5 Aug
• Deadline for receipt of comments on formal consultation	5 Aug
• Submit planning application to Planning Inspectorate	6 Dec

• *Bay area school summer holidays: 23 July to early Sept*

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TLSB programme – post-application phase

Programme based on 31 October submission

• 28 days for Planning Inspectorate to accept/refuse the application	3 Jan '14
• Pre-examination phase (publicity, registration, preliminary public meeting)	Jan-Apr '14
• Examination phase (hearings, Local Impact Reports)	Apr-Aug '14
• Recommendation by Planning Inspectorate	Oct '14
• Decision by Secretary of State for Energy	early '15

BUILD PHASE – targets as of May 2013

• Construction start, target	Mar 2015
• Construction complete, target	End 2017

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Swansea Bay – opportunity overview

- **240MW** tidal lagoon generating up to **400GWh** (net) annually. Electricity for **121,000 homes** (equivalent to Swansea's domestic use, 70% of the Bay's, or 8% of Wales')
- An extremely **reliable electricity source** offering predictable, zero carbon, electricity for 100 years. Saving c.216,000 tonnes CO_2 p.a.
- **World's first man-made lagoon** capable of generating electricity avg. 14 hours a day using both ebb and flood tides
- An iconic **education, sports** and **art amenity**
- An opportunity to develop a **tidal range industry** for the UK, centred around Wales
- Low risk adaptation of **proven components**. Project is comprised of UK standard sand core breakwater & bulb hydro turbines mounted inside concrete turbine housings

Welsh Power Comparison

Alltwalis, Carm. (wind)	23MW
Barry Power Station (gas)	235MW
Gwynt y Môr (offshore wind)	576MW
Wylfa, Anglesey (nuclear)	490MW

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Long-term economic benefits

- **Job creation** – internal estimate (subject of an independent study), but new jobs will be created directly & indirectly across wide range of sectors & skills, e.g:
  - **Supply chain & construction** – c.2,880 new jobs of which 1/3 direct & 2/3 indirect/ induced, c.80% local. Turbine housings, sluice gates, flood doors, rails, electrical controls, hydraulics, precast concrete components, the visitor centre & ancillary buildings could all be manufactured/built locally
  - **Quarrying** – preferred North Wales quarry, min. 40 jobs for 3yrs (excl. indirect/induced)
  - **Operations & maintenance** – min. 20 long-term, permanent jobs running the lagoon
  - **Tourism** – min. 40 permanent jobs created in visitor facilities (excl. indirect/induced)
- **Community fund** – 'lagoon grants' for community programmes, e.g. education outreach, energy efficiency schemes, recreational equipment for outdoor pursuits
- **Share offer** – public investment in the lagoon with South Wales prioritised
- **Cheaper electricity** – local lagoon electricity tariffs via partnership with Good Energy plc.

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Key partners

ATKINS – Design, engineering & project management

ALSTOM VOITH – Turbine design & testing

Van Oord Marine ingenuity – Dredging, marine engineering & offshore projects

KGAL – Specialist in control & design of water gates

COSTAIN – Tier one, engineering solutions providers

LDA DESIGN – Masterplanning & landscape design

TENCATE materials that make a difference – Textiles technology, Geotubes®

sgurr energy – Engineering consultancy specialising in renewables

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Tidal Lagoon Swansea Bay

An artist's impression *(CAD used to size wall heights)*

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