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Silwa Tidal Power Station

Tidal Range: Power, Protection, Permanence.

National Infrastructure for a Resilient Energy System

From the British Hydropower Association

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Foreword

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The UK stands at a moment of profound change. Our energy system is being rebuilt at pace. But in doing so, we are becoming more exposed, to weather, to global supply chain shocks, and to system instability. In this context, the question is no longer simply how we generate clean power. It is how we build a resilient system that can endure.

Tidal range offers a clear answer

It is Power: Predictable, sovereign, and available for generations to come. Driven not by weather, but by the gravitational forces of the moon. At a time when our system is becoming increasingly dependent on variable generation, this certainty is not just valuable; it is essential.

It is Protection: Infrastructure that does not merely sit within the system, but actively reduces risk. Tidal range schemes strengthen coastal resilience, mitigate flood risk, and protect communities, industry, and critical national infrastructure. In doing so, they reduce future public cost and increase national security.

It is Permanence: Designed to operate for over a century, tidal range is intergenerational infrastructure. It is built once, but delivers value across decades, through energy security, economic regeneration, and a revitalised domestic industrial base.

Tidal range must not be viewed as a niche renewable technology. It is national infrastructure, a strategic asset that strengthens the resilience of our energy system, our economy, and our society.

This brochure sets out the scale of the UK's resource opportunity. The projects identified here represent more than capacity. They represent a coordinated pathway to deliver long-life, multi-benefit infrastructure that supports clean power, protects our coasts, and anchors regional growth. In a more uncertain world, resilience is no longer optional. Tidal range is not simply about generating clean power.

It is about ensuring the system is resilient, enduring and works when it matters most. This is not a new technology. It is proven. It is scalable. And the United Kingdom possesses one of the greatest tidal resources in the world.

Aerial view of the tidal power plant La Rance, France

What is Tidal Range Hydropower?

Tidal range is a form of large-scale, low-head hydropower that converts the potential energy created by the height difference between high and low tides into electricity, using coastal barrages or lagoons. Generation occurs on predictable tidal cycles, independent of weather conditions. Schemes use established turbine technology and have an operating life exceeding 100 years.

The technology is commercially proven at scale, with long-operating reference assets such as La Rance (France) and Sihwa (Republic of Korea). The UK possesses a globally significant tidal range resource, particularly in the Severn Estuary and along the west coast, with an identified technical potential exceeding 20 GW.

Unlike other renewables, tidal range is not weather-dependent and provides a predictable, system-stabilising role within the electricity network

Scheme	Country	Installed Capacity	Commissioned
La Rance Tidal Power Station	France	240 MW	1966
Sihwa Lake Tidal Power Station	South Korea	254 MW	2011

Table 1: Details of two operational tidal range schemes

Tidal Range Hydropower at a Glance

Power

Predictability: Tides can be forecast with high accuracy for centuries into the future. This enables reliable system operation and supports long-term planning.

Firm Power: Reduces balancing costs and reliance on peaking gas generation. Reduces system volatility and exposure to weather-driven generation patterns.

Scale of UK Opportunity: Over 20 GW of identified technical potential, concentrated in the Severn Estuary, Irish Sea and along the west coast.

Grid Resilience: Creates generation next to load, reduces the impact on the transmission network and minimises losses associated with distance. Provides essential system services, such as inertia and reactive power.

Load Growth: Given the rapid growth in demand from data centres, there is a need to revise NESO's Future Energy Scenarios and large-scale generation technologies such as tidal range should be accelerated.

Protection

Flood Defence: Over 10 million people in the UK live in areas at risk of coastal or river flooding. Tidal Range can deliver flood mitigation and reduced flood risk.

Coastal Resilience: Provides protection for critical national infrastructure, including ports, transport links, coastal rail networks, and coastal industry.

Delivery Resilience: The UK must spread the deliverability risk of its Clean Power mission across a diverse portfolio of technologies, avoiding over-reliance on a small number of generation technologies and supply chains, which increases the risk of non-delivery.

Economic Resilience: Protects coastal economies, supply chains and industrial activity from increasing climate and flood risk, reducing long-term disruption and public cost.

Habitat Protection: Supports the protection and adaptation of coastal and estuarine habitats by enabling active management of sea levels in response to climate change.

Permanence

Asset Life: With operating lives typically exceeding 100 years, the lifecycle of tidal range infrastructure far exceeds that of other generation technologies and reduces the need for repeated reinvestment over time.

Economic Impact: High domestic content (60–80% UK), driven by civil and marine construction, ports, fabrication and long-term operations.

Supply Chain: Aligned with existing UK capabilities in heavy civils, marine construction, precast concrete, turbines, gates and balance-of-plant offers an opportunity to enable reindustrialisation in key Industrial heart lands.

Enabling Infrastructure: Many schemes will also provide transport links, amenity value, port upgrades and long-term regional regeneration.

Policy Fit: Regulated Asset Base is a proven policy enabler for nationally significant infrastructure. Tidal Range will benefit from a regulated or risk-sharing framework reflecting high upfront costs, long asset lives and low operational risk.

Why do we need Tidal Range now?

The UK is building an electricity system that is increasingly weather-dependent, harder to operate, and more vulnerable to failure during periods of system stress.

Amid ongoing energy price volatility caused by another global energy crisis, we must reassess whether our pathway away from fossil fuels is truly deliverable.

- Consumer bills are rising due to wholesale price exposure, escalating network, constraint and balancing costs. Tidal range directly reduces this exposure by providing predictable, time-tabled generation that lowers reliance on expensive balancing actions and peaking gas.
- Fossil fuels continue to set electricity prices. Tidal range displaces price-setting gas with firm, domestic renewable power.
- Global supply chain pressures and inflation are delaying projects. Tidal range mitigates this risk through a civil-led, high-UK-content supply chain less exposed to international volatility.
- As the system becomes dominated by variable renewables, operational challenges such as dunkelflaute (periods of low wind and solar generation), low inertia, and voltage control are increasing. Tidal range provides inherent inertia and system stability services.
- Grid congestion and transmission constraints are growing. Tidal range schemes are located close to major demand centres, reducing network strain and losses.
- Electricity demand is seeing an unforecasted step change in growth from data centres. Tidal range represents one of the few large-scale predictable renewable resources still largely untapped in the UK.

In this context, tidal range hydropower is not just another renewable technology, but a strategic infrastructure solution. It enhances system resilience, complements deliverability of the Clean Power 2030, grows new domestic supply chains and meets unforecasted load growth.

The Role of Government

Tidal range must be treated as nationally significant infrastructure, not as a conventional generation technology.

Tidal range hydropower is characterised by high upfront capital costs, very long asset lives, and low operating risk. As a result, it is poorly suited to full merchant market exposure, despite its technical maturity. As with other nationally significant, long-life infrastructure, an appropriate risk-sharing framework is required to unlock private investment while protecting consumers. The introduction by Government of a cap and floor mechanism for Long Duration Energy Storage provides a useful example. For tidal range, the Regulated Asset Base (RAB) model would align construction risk, asset longevity and system benefits without constituting a technology subsidy. Thames Tideway Tunnel provides a useful precedent, showing how the RAB can support critical infrastructure deployment, reducing cost of capital and protecting consumers. This reflects the fact that tidal range delivers system-wide and societal benefits beyond electricity generation, including flood protection and long-term resilience.

It is essential that Government extends the Clean Power 2030 portfolio to de-risk deliverability of the existing pathway, extend the UK's ability to grow the economy through utilisation of legacy industrial capability and utilise our natural resource, as an Island Nation, of our tides.

Government should assess tidal range as multi-benefit national infrastructure, reflecting its combined energy, flood protection and resilience value.

Locations

Locations of Tidal Range schemes under development

Our Island Nation's Tidal Range resource

The projects are detailed according to their geography, starting with Western Somerset Lagoon in the South West and moving clockwise round the Country.

	Scheme Name	Scheme Location	Overview	Status
1.	**West Somerset Lagoon**	Between Minehead and Watchet	~6.5 TWh/year | ~20,000–30,000 job years | Protects vulnerable coastal communities	**Development**
2.	**Aberthaw Lagoon**	Aberthaw	~1.3 TWh/year | £3.2bn+ GVA | Addresses one of the UK's highest flood-risk zones	**Development**
3.	**Swansea Tidal Lagoon**	Swansea	~0.5–1 TWh/year | 16,000+ jobs | Protects urban waterfront	**Advanced (DCO precedent)**
4.	**North Wales Tidal Lagoon**	Colwyn Bay, North Wales	~4.5 TWh/year | Regeneration of highly deprived coastal communities | Protects critical transport infrastructure | Large scale coastal flood protection	**Development**
5.	**Mostyn SeaPower**	Mostyn North Wales	~300 GWh/year | Regional industrial growth | Protects coastal transport links	**Development**
6.	**Mersey Tidal Power**	Between Birkenhead and Liverpool	~2 TWh/year | £3.5bn+ GVA | Protects major urban region	**Advanced (pre-DCO)**
7.	**Natural Wyre**	Between Fleetwood and Knott End-on-Sea	~287 GWh/year | Regeneration in one of England's most deprived coastal areas | flood defence for low-lying communities	**Development**
8.	**Morecambe Bay & Duddon Estuary**	Between Morecambe and Barrow in Furness	~7.8 TWh/year | Tens of thousands of job years | Large-scale coastal protection	**Concept**
9.	**Solway Firth**	Between Dumfries and Cumbria	Multi-GW potential | Rural economic renewal | Coastal resilience for vulnerable communities	**Concept**
10.	**Centre Port**	Between Lincolnshire and Norfolk	~1 million people protected | New deep-sea port and Industrial hub | Multi-billion infrastructure investment	**Development**

Advanced: Progressing through consenting and delivery pathway
Development: Active design, feasibility and stakeholder engagement
Concept: Early-stage opportunity requiring further development

Continued...

Coastal Resilience and Flood Protection

Tidal range is one of the few forms of energy infrastructure that can both generate power and reduce the national flood risk. Flood protection is a core system benefit, not a peripheral co-benefit, yet it is largely excluded from traditional energy appraisal. Tidal range schemes can provide long-term coastal and estuarine flood defence, reducing future public expenditure and climate risk. For example, the proposed Mersey Tidal Power scheme should be viewed not only as an energy generator, but as the Mersey's equivalent to the Thames Barrier; a piece of nationally significant infrastructure that protects communities, displaces future flood defence costs, and enhances resilience to sea level rise and extreme weather events.

Strengthening UK Capability through a Domestic Supply Chain

Tidal range hydropower is fundamentally a civil and marine-led infrastructure technology, with core components, closely aligned to existing UK strengths in heavy civil engineering, marine construction, precast concrete, fabrication and ports. With up to ~80% UK content, tidal range creates a domestic supply chain that reduces exposure to global volatility and de-risks delivery compared with import-dependent technologies. It also provides a clear pathway to rebuild industrial capability that has significantly diminished, but remains latent across UK regions, particularly in coastal and industrial heartlands.

Workforce, Skills and Long-Term Employment

Tidal range projects require a broad, transferable workforce, spanning civil engineering, marine operations, electrical and mechanical systems, environmental monitoring and long-term asset management. Construction phases support large, sustained workforces over many years, followed by stable, skilled operational roles lasting decades. This profile aligns strongly with coastal and post-industrial regions, providing opportunities to redeploy skills from heavy industry. Crucially, a visible project pipeline enables forward planning of training, apprenticeships and workforce development, ensuring skills are built ahead of peak demand and retained within the UK economy.

Sequenced Delivery to support Long-Term Growth and Supply Chain Development

A programme-based pipeline of tidal range projects enables repeatable delivery and learning curve benefits, particularly in caisson fabrication, turbine assembly and control systems. This creates the confidence required for early investment in UK manufacturing capacity, allowing supply chains to re-emerge, scale and mature over time. A sequenced approach underpins cost reduction, standardisation and sustained industrial growth, ultimately supporting the development of a domestic tidal range industry with export potential.

Regional Regeneration and Capturing Long-Term Economic Value (GVA)

Tidal range projects act as anchor infrastructure for regional regeneration, concentrating investment, jobs and supply chain activity within specific geographies over long construction periods and 100+ year operational lifetimes. This drives substantial local Gross Value Added (GVA), supporting ports, fabrication yards, engineering firms and wider local economies. However, these long-term, place-based benefits, alongside social and strategic value, are not fully captured under current appraisal methodologies. Reform of the HM Treasury Green Book is needed to properly account for regeneration, skills development and the enduring economic contribution of infrastructure of this scale.

Volume of Generation

A coordinated programme of tidal range projects would provide diversity of tidal phasing across the UK coastline, smoothing aggregate output and reducing system volatility.

This becomes increasingly important as electricity demand accelerates, particularly from data centres and electrification, raising a fundamental system question: how will large, sustained volumes of reliable generation be delivered to meet this new growth?

West Somerset Tidal Lagoon

Summary

West Somerset Tidal Lagoon is a 2.5 GW tidal lagoon scheme in the Bristol Channel, extending between Minehead and Watchet in West Somerset. The scheme will have the ability to deliver around 6.5 TWh of fully predictable electricity per year, using approximately 125 low-head turbines within a lagoon enclosed by a ~22km wall and impounding an area of roughly 80 km². The project has an indicative capital cost of £11.2bn, reflecting its scale and multi-benefit ambition. Generation cost of under £100 per MWh at first commissioning under a Regulated Asset Base model, reducing over time, showing value for money against other low.

The scheme also highlights opportunities for co-location of floating solar, wind, marine farming and energy storage. From a delivery perspective, the project is designed around repetitive caisson and modular construction, well suited to UK port-based manufacturing, with substantial demand for aggregates, marine plant, precast fabrication, turbines, gates and long-term O&M, creating a clear pipeline for skills in civil, marine, electrical, hydraulic and environmental disciplines.

Co-Benefits

Coastal Protection: Protection of low-lying coastal communities of Minehead and Watchet, which are increasingly exposed to storm surge and coastal erosion.

Coastal storm protection and resilience benefits are integral to the scheme.

Regeneration: West Somerset has some of the lowest productivity levels in England and an ageing population, with limited access to high-value employment. The scheme acts as anchor infrastructure for the economic renewal of coastal Somerset and long-term regeneration of Minehead and surrounding coastal communities. Visitor, leisure, tourism and regeneration masterplan elements (marina, education, recreation) will support local economies that have experienced structural decline and limited inward investment.

Economy and Jobs: Delivered over 8–10 years, the scheme would generate tens of thousands of job years and create strong supply-chain activity across Southwest England and South Wales.

System Resilience: Strengthens Southwest energy resilience and supports electrification and port decarbonisation.

Supply Chain: Anchor long-term UK tidal range manufacturing and refurbishment capability.

Status

Development work and design alongside active stakeholder engagement and evidence-building. A build time of ~5 years to first generation. Currently working towards consenting and financing pathway.

Key attribute	Detail
Installed capacity	**2.5 GW 13 bi-directional low-head turbines**
Annual generation	**~6.5 TWh/year**
Lagoon wall length	**~22 km**
Lagoon area	**~80 km²**
Design life	**>100 years**
Indicative cost	**£11.2bn (2025 prices)**

Aberthaw Lagoon

Summary

The Aberthaw Tidal Lagoon is a potential project concept identified through work undertaken following the recommendations of the Severn Estuary Commission (SEC). The Commission concluded that tidal range energy in the Severn Estuary has the potential to play a strategic role in the UK's future energy system, and that well-sited lagoon schemes could be technically feasible, commercially viable and environmentally manageable.

In response to the SEC's recommendations, Cardiff Capital Region and the West of England Mayoral Combined Authority have undertaken early-stage work to identify projects that could align with the Commission's criteria for a future Commercial Demonstration Project.

As part of this process, a potential ~600 MW tidal lagoon concept to the east of Aberthaw has been identified. At this stage, the project remains conceptual and subject to further feasibility, environmental assessment, commercial development and government policy decisions.

The concept has been identified as having the potential to:

- Demonstrate how a commercial-scale tidal lagoon project could be delivered
- Support the development of environmental monitoring and adaptive management approaches.
- Inform the potential long-term development of a wider Severn Estuary tidal lagoon programme.

The Aberthaw area has also been identified as strategically significant due to its proximity to the potential around redevelopment of the former coal fired Aberthaw power station into a low carbon destination, existing grid infrastructure and brownfield industrial land, which may support its future role as part of a nationally significant clean energy cluster.

Co-Benefits

Regeneration: Enables the transition of former industrial sites into a new clean energy and manufacturing cluster. Anchor infrastructure for Aberthaw Clean Energy Park. Regional regeneration in South Wales and Southwest England.

Economy and Jobs: GVA, jobs and skills

- Planning phase (7 years): ~£248m GVA & ~4,200 job years
- Construction phase (5 years): ~£3.23bn GVA & ~36,500 job years
- Operations: ~£31m GVA annually, ~250 permanent jobs & 120+ year asset life.

System Resilience: Much needed green energy source for SE Wales.

Supply Chain: Major UK supply-chain and skills activation (marine civils, caissons, turbines, ports, fabrication, R&D).

- Sea level rise protection: The scheme would support protection along the South Wales coastline that it impounds.

Status

Concept-stage opportunity. No final development, investment or delivery decisions have been made.

Key attribute	Detail
Installed capacity	**~600 MW**
Annual generation	**~1.3 TWh/year (~450,000 homes)**
Lagoon wall length	**~12 km**
Lagoon area	**~15-20km²**
Design life	**>100 years**
Indicative cost	**~£3.25 billion (2025 prices)**

Swansea Tidal Lagoon

Summary

A previous iteration secured a development consent order (DCO) and was intended to de-risk a wider UK lagoon fleet. Although it did not proceed, Swansea remains one of the most advanced tidal range opportunities and a key route to demonstrating the national case.

At its core is a reconfigured tidal power station integrated with solar, a renewable-powered data centre, and advanced manufacturing. This strengthens the commercial case by linking generation directly to high-value demand and long-term regional employment. The updated project is now framed as an energy and industrial cluster, supporting manufacturing, digital infrastructure, skills, regeneration, and coastal resilience, while driving Welsh supply-chain growth and waterfront development.

Co-Benefits

Coastal Protection: Protects a major urban waterfront, including thousands of homes and businesses in Swansea Bay to sea level rise and storm events.

Regeneration: Accelerates regeneration of Swansea waterfront, creating a high-value economic zone linking energy, digital infrastructure and advanced manufacturing. Tourism, public realm and destination value through Dragon Head Park, visitor facilities and waterfront amenities.

Public Support: Independent polling and consultation show strong support for the Swansea Bay Tidal Lagoon, with over 80% support recorded by an independent ComRes survey and a positive statutory planning outcome reflecting local economic importance.

Economy and Jobs: The project is forecast to support over 2,500 direct roles and more than 16,000 jobs across the wider economy.

System Resilience: Integrated model linking tidal power with solar, storage, advanced manufacturing, and data infrastructure. Renewable-powered data centre and community heat network potential.

Supply Chain: Significant local employment and supply-chain activation. High-value manufacturing and innovation co-located with renewable generation.

Status

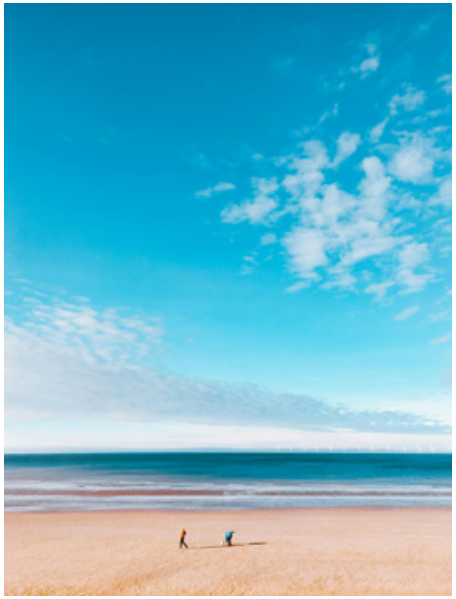
A Development Consent Order was granted in June 2015 for the earlier Swansea Bay proposal, but the scheme did not proceed following the UK Government's 2018 decision not to support the CfD strike price. The Swansea Project is now continuing through planning, consenting, and commercial development. The previously granted DCO remains an important precedent.

Key attribute	Detail
Installed capacity	**380 MW**
Annual generation	**0.44 TWh/year**
Lagoon wall length	**~10km**
Lagoon area	**~12km²**
Design life	**>100 years**

North Wales Tidal Lagoon

Summary

North Wales has long been recognised as having strong tidal range potential due to its funnelled Irish Sea coastline and proximity to existing transmission infrastructure. The scheme is positioned as complementary to other North Wales energy assets, including offshore wind, nuclear (Wylfa site), and port-based industrial clusters. With an installed capacity up to 2.5 GW this coastal lagoon scheme could generate up to 4.5 TWh of electricity per year.



Co-Benefits

Coastal Protection: North Wales coast is increasingly exposed to sea level rise, with long-term risk to transport and housing infrastructure. The scheme will protect vulnerable coastal infrastructure including the North Wales Coastal Railway, the A55 and low-lying communities at increasing risk from sea level rise, especially Rhyl and Kinmel Bay.

Regeneration: Rhyl is consistently ranked among the most deprived communities in Wales, with some neighbourhoods in the top 10% most deprived in the UK. The scheme will support economic regeneration in areas where long-term structural decline has created significant economic and social challenge. The scheme acts as a catalyst for levelling up coastal North Wales through sustained infrastructure investment. Amenity and tourism benefits linked to waterfront regeneration.

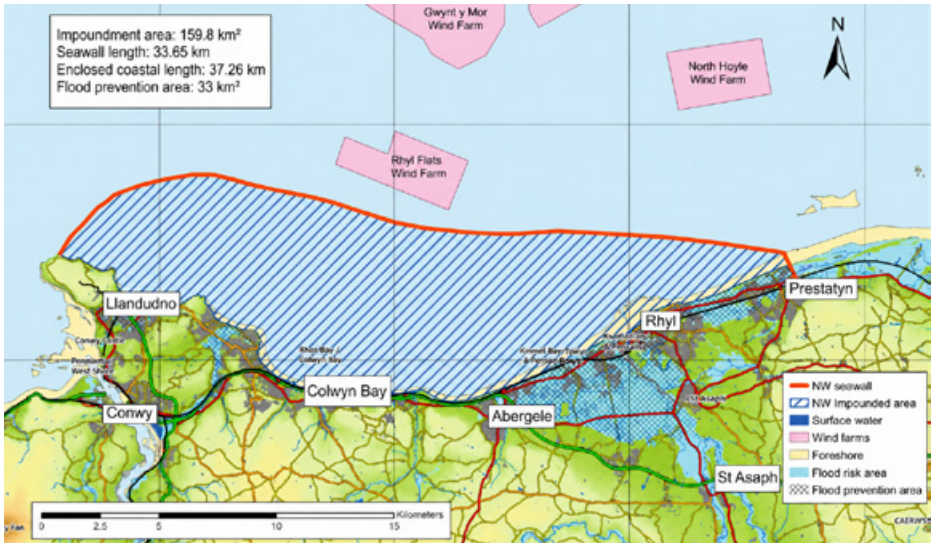
Economy and Jobs: Significant job years during construction (marine civils and electro-mechanical dominant) Long-term skilled O&M employment across hydro-mechanical, electrical, digital control, marine and environmental disciplines.

System Resilience: Located proximate to strong grid nodes, industrial demand and future Wylfa-related infrastructure. Co-location opportunity for battery storage, hydrogen electrolysis or direct-wire industrial supply.

Supply Chain: Activation of North Wales ports and regional fabrication clusters.

Status

Requires further hydrodynamic optimisation, environmental assessment, grid confirmation and commercial structuring before progressing to formal Development Consent Order (DCO) submission.



Key attribute	Detail
Installed capacity	**~2.5 GW range (concept scale)**
Annual generation	**~4.5 TWh/year (indicative range depending on configuration)**
Lagoon wall length	**33km**
Lagoon area	**159.8 km²**
Design life	**>100 years**

Mostyn SeaPower Tidal Lagoon

Summary

Mostyn SeaPower is a proposed tidal lagoon in the Dee Estuary, North Wales, positioned as a regionally scaled, multi-benefit coastal infrastructure project. The scheme comprises 8 × 16 MW or 8 × 21 MW bi-directional turbines (128 MW), generating ~300 GWh per year, with a ~6.7 km lagoon wall enclosing ~12.2 km². As a long-life asset, it is designed to deliver predictable renewable electricity for over 100 years.

Co-Benefits

Coastal Protection: Coastal flood protection for low-lying land, A548 and North Wales Coastal Railway.

Regeneration: Strengthens the economic role of the Dee Estuary as a regional industrial and logistics hub. Public access route along lagoon wall; potential aquaculture/ amenity/tourism benefits.

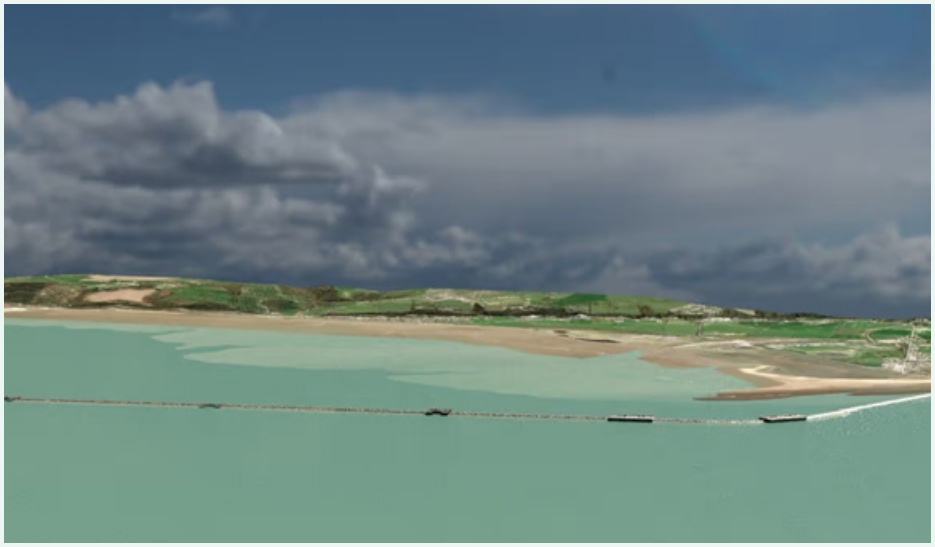
Economy and Jobs: Investment capable of delivering material regional economic value while acting as an early deployment project for the wider UK tidal range fleet.

System Resilience: Grid connection discussions linked to nearby Connah's Quay demand.

Supply Chain: The project would allow Welsh and Northwest supply chains, including steel fabrication, turbine assembly, port-based pre-construction and marine civils, to build capability, de-risk delivery models and standardise components, directly supporting future deployment at larger schemes such as Mersey, Severn and West Somerset. Construction would utilise the adjacent port, supporting civil works, electro-mechanical supply, and opportunities for regional fabrication and supply chain development.

Status

The project is at development stage (pre-DCO), with hydrodynamic and geophysical studies, environmental data collection, grid connection agreement with NESO finalised. Subject to programme updates and Government policy the scheme could have a 4 year build period and be commissioned in the early 2030s.



Key attribute	Detail
Installed capacity	**8 × 16 MW or 8 x 21 MW = 128 MW**
Annual generation	**~298 GWh/year**
Lagoon wall length	**~6.7 km**
Lagoon area	**~12.2 km²**
Design life	**>100 years**

Mersey Tidal Power

Summary

Mersey Tidal Power is a proposed large-scale tidal barrage across the River Mersey estuary in the Liverpool City Region, promoted as a flagship piece of multi-benefit infrastructure combining clean energy generation with transport connectivity and regional regeneration. The project will have an installed capacity of around 700 MW, delivering approximately 2 TWh of highly predictable electricity per year, located directly adjacent to major demand centres across the Liverpool–Manchester conurbation. As with other tidal range schemes, the barrage would be designed as long-life infrastructure, with an expected operating life in excess of 100 years.

Co-Benefits

Coastal Protection: Provides long-term flood protection for communities and critical infrastructure across the Mersey Estuary, reducing exposure to climate-driven sea level rise. Comparable in strategic importance to the Thames Barrier in protecting a major UK economic region.

Regeneration: Acts as transformational infrastructure for the Liverpool City Region, driving regeneration across the Wirral and South Liverpool waterfronts. Supports economic renewal in communities facing long-term deprivation and industrial transition.

Economy and Jobs:

- Across planning and construction (c.11–14 years), the scheme would deliver approximately £3.5–3.8bn GVA and 39,000–44,500 job years, with peak on-site employment of up to 5,000 roles.
- In operation, it would generate £30–35m annual GVA, support 250–300 permanent skilled jobs, and operate for 120+ years with long-life civil structures and periodic turbine refurbishment.
- The scheme will support a regional skills pipeline and drive major regeneration across the Wirral and South Liverpool waterfronts.

System Resilience:

System & Strategic Value

- Predictable, non-weather dependent generation
- Provides inertia and grid stability benefits
- Reduces balancing and constraint costs
- Long-life, low lifecycle carbon asset

Supply Chain: The scheme will activate Northwest ports (Liverpool, Birkenhead and Ellesmere Port).

Status

In development (pre-consenting / project development phases referenced by Liverpool City Region Combined Authority and public updates via the Development Consent Order)

Ongoing development and consultation activity; latest public updates indicate a multi-year development/consenting programme before construction (2035)

Key attribute	Detail
Installed capacity	**~700 MW**
Annual generation	**~2 TWh/year**
Lagoon wall length	**~2-3km**
Lagoon area	**~20-25km²**
Design life	**>100 years**
Indicative cost	**£3.5-3.8bn**

Natural Wyre – Natural Energy Wyre

Summary

Natural Energy Wyre (NEW) is a proposed tidal barrage across the River Wyre estuary in Lancashire. It would deliver predictable renewable electricity while supporting coastal resilience and regional regeneration. The scheme is framed as an integrated energy solution, combining tidal generation with storage, grid balancing, and coastal protection.

Co-Benefits

Coastal Protection: Provides tidal defence for low-lying communities along the Wyre estuary, reducing long-term flood and erosion risk.

Regeneration: Fleetwood and parts of the Fylde Coast rank among the most deprived areas in England, with high economic inactivity and limited industrial diversification. The scheme supports economic renewal in Fleetwood and surrounding coastal towns (Blackpool), which experience limited economic diversification.

The scheme creates connectivity and economic linkage across the estuary, improving access and investment potential.

Economy and Jobs: Construction would generate regional employment across marine engineering, civil works, fabrication and port-based logistics in Northwest England.

System Resilience: Located close to major offshore wind developments in the Irish Sea, creating potential system balancing and integrated energy opportunities.

Supply Chain: The project would also support local supply chains in aggregates, precast concrete, turbines, gates, electrical systems and marine plant.

Status

Early-stage project development with preliminary design and stakeholder engagement completed. Development pathway requiring planning consent and early seed funding to complete the development phase before financial close and construction.

Key attribute	Detail
Installed capacity	**160 MW (6 turbines)**
Annual generation	**~287 GWh/year**
Lagoon wall length	**~1-2 km**
Design life	**>100 years**

Morecambe Bay & Duddon Estuary Tidal Lagoon

Summary

Typically framed as a pair of barrages this scheme has a combined installed capacity of around 4 GW and potential annual generation of up to ~7.8 TWh, positioning the scheme among the largest in the UK equivalent to powering ~2 million homes.

Co-Benefits

Coastal Protection: Provides large-scale flood and coastal protection across Morecambe Bay, an area exposed to tidal and storm surge risk.

Regeneration: Barrow-in-Furness is identified as a key growth area but requires major infrastructure investment to unlock potential. The scheme will support economic revitalisation in Barrow-in-Furness and surrounding coastal communities. New connectivity across the bay unlocks access, investment, and labour mobility. There would also be the positive impact of tourism and public realm benefits via visitor facilities and promenade.

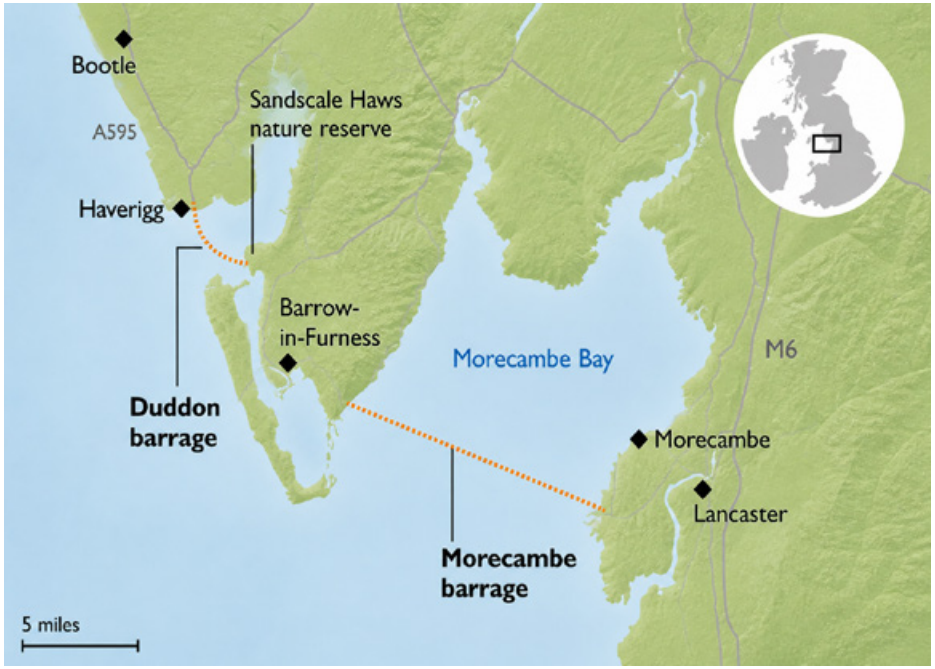
Economy and Jobs: Significant construction employment would generate tens of thousands of job years across marine civils, fabrication, turbines and port logistics. Ongoing operations would sustain skilled operational roles and long-term refurbishment activity, acting as a durable economic anchor for Lancashire and Cumbria.

System Resilience: Schemes would complement Irish Sea offshore wind, reduce balancing and constraint costs, and strengthen Northwest grid resilience alongside supporting industrial electrification and potential hydrogen integration.

Supply Chain: Anchoring a large-scale UK marine and supply chain capability with strong stimulus for Northwest England supply chain.

Status

Development finance required to refresh strategic and finance case and alongside the design and delivery plan.



Key attribute	Detail
Installed capacity	**4 GW**
Annual generation	**~7.8 TWh/year**
Lagoon wall length	**~20-25km**
Lagoon area	**~150-200km²**
Design life	**>100 years**

Solway Firth Tidal Lagoon

Summary

The scheme is framed as a lagoon-style, or partial-estuary enclosure, rather than a full barrage across the entire Firth, with a phased and modular development and reduced navigational and environmental constraint relative to full-barrage options.

Co-Benefits

Coastal Protection: Enhances resilience of vulnerable coastal and rural communities to flooding and extreme weather.

Regeneration: Provides long-term economic opportunity in Dumfries & Galloway, an area with limited large-scale infrastructure investment. The project aligns with coastal and rural economic renewal objectives in areas historically dependent on agriculture, ports and traditional industry. Amenity, tourism and active-travel opportunities along lagoon crest. Ports in the Irish Sea region (e.g., Workington, Cairnryan, Heysham) could potentially support logistics and fabrication.

Economy and Jobs: Multi-thousand construction job years (marine civils, quarrying, fabrication). Long-term O&M employment (hydro-mechanical, electrical, digital, environmental).

System Resilience: B6 boundary - Given Scotland's high wind penetration, tidal range in the Solway could play a balancing and diversification role within the GB system.

Supply Chain: Activation of local ports and marine services Potential anchor infrastructure for Dumfries & Galloway regeneration.

Status

Concept-stage & requires development finance for Hydrodynamic modelling, Environmental baseline surveys and Grid connection engagement.

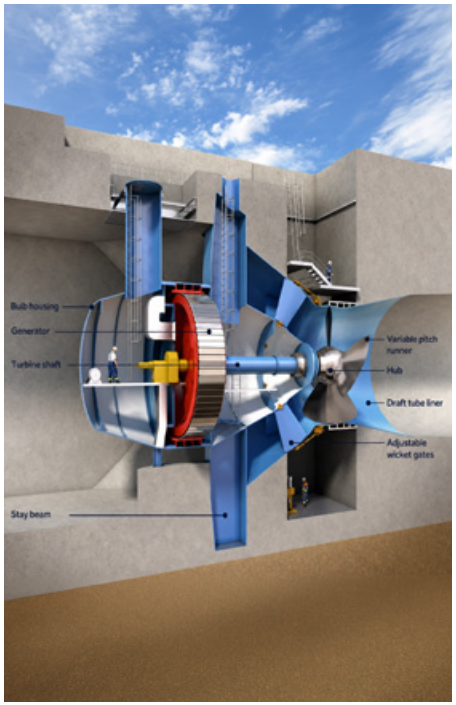
Key attribute	Detail
Installed capacity	**5-10 GW**
Annual generation	**~10-20 TWh/year**
Lagoon wall length	**~25-40km**
Lagoon area	**~300-500km²**
Design life	**>100 years**

Centre Port UK

(The Wash Tidal Barrage & Container Terminal)

Summary

Centre Port UK is a proposed multi-benefit tidal barrage across The Wash, linking Lincolnshire and Norfolk, combining flood defence, predictable renewable energy generation, and a deep-sea container terminal within a single piece of national infrastructure.



Co-Benefits

Centre Port UK is a multi-billion-pound integrated infrastructure project combining an ~18 km tidal barrage with a deep-sea container terminal.

Coastal Protection: Protects extensive low-lying agricultural land and communities across The Wash, an area highly exposed to sea level rise for up to ~1 million people.

Regeneration: Enables creation of a new strategic logistics and industrial hub for the UK. Delivery would require a major marine and port infrastructure programme, with the potential to anchor a new industrial cluster powered by long-life, predictable tidal generation.

- In operation, it would anchor a new logistics and industrial cluster, with ~1.5 million TEU phase-one throughput and long-term employment in port, energy and asset management.
- Decarbonisation of major freight and industrial demand through electrified port operations
- Supports levelling up in parts of Lincolnshire and Norfolk with historically lower investment levels.

Economy and Jobs: Construction would generate significant job years across marine civils, port engineering, turbines and transport links, stimulating supply chains across Eastern England and the UK.

Supply Chain: Transport connectivity via new crossing plus logistics/port growth.

Status

The scheme is making progress toward the Development Consent Order (DCO) and a staged delivery approach.

Key attribute	Detail
Installed capacity	**~1.5-2.0 GW**
Annual generation	**~3-5 TWh/year**
Lagoon wall length	**~18 km**
Lagoon area	**~400-600km²**
Design life	**>100 years**

	Project	Region	Status/ Scale
1.	**West Somerset Tidal Lagoon (Bristol)**	Bristol Channel - Southwest England	Feasibility and site selection completed, DCO 2027-29. 6.5 TWh of fully predictable electricity per year, using approximately 125 low-head turbines within a lagoon enclosed by a ~22 km wall and impounding an area of roughly 80 km².
2.	**Aberthaw Lagoon**	Welsh and Bristol Channel – South Wales	Feasibility and site selection being undertaken 2026, DCO 2027-29. 600 MW of fully predictable electricity per year, using approximately 60-100 low-head turbines within a lagoon enclosed by a ~10 to 12 km wall and impounding an area of roughly 80 km²
3.	**Swansea Bay Tidal Lagoon**	South Wales	Feasibility and site selection completed for smaller scheme. Larger scheme work in progress. Potential of 350–1,000 MW scheme, while providing a long-life asset to a wider fleet of UK lagoons and deliver associated regeneration and public-realm benefits along the Swansea waterfront.
4.	**North Wales Tidal Lagoon (Colwyn Bay)**	North Wales	Feasibility and site selection being assessed. A mid to large-scale tidal range lagoon typically framed in the 2.5GW concept range, delivering approximately ~4.5 TWh per year of fully predictable generation, with a 100+ year asset life and positioned as part of a wider North Wales and UK tidal range portfolio.
5.	**Mostyn SeaPower**	Dee Estuary - North Wales	Mostyn SeaPower own and operates the adjoining port of Mostyn and have planning/grid connection for the project. Installed capacity: 8 × 16Mw - 21MW = 128 MW; Annual generation: ~298 GWh/ development-stage proposal.
6.	**Mersey Tidal Power**	Northwest England	The formal application for a Development Consent Order (DCO) is currently aimed for submission in 2026. 2 TWh of highly predictable electricity each year, located directly adjacent to major demand centres across the Liverpool–Manchester conurbation.
7.	**Natural Wyre**	Northwest England	Early-stage pathfinder tidal barrage (~287 GWh/year), positioned to demonstrate UK tidal range delivery models and support future large-scale deployment.
8.	**Morecambe Bay & Duddon Estuary**	Lancaster / Cumbria	4 GW with potential annual generation of up to ~7.8 TWh, positioning the scheme among the largest tidal range concepts in the UK.
9.	**Solway Firth (Dumfries)**	Southwest Scotland	5-10 GW of installed capacity, delivered through a coastal lagoon or partial-estuary enclosure designed as long-life infrastructure with 100+ year asset life.
10.	**Centre Port UK - The Wash Tidal Barrage & Container Terminal)**	East England	Raising funding for DCO 2026 process. ~18 km across the wash, generating fully predictable renewable electricity at scale, sufficient to power around 600,000 homes and businesses while simultaneously delivering flood protection and enabling a new deep-sea container port.

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BRITISH HYDROPOWER ASSOCIATION

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TIDAL RANGE ALLIANCE

The British Hydropower Association is the leading trade membership association solely representing the interests of the UK hydropower industry.

Our mission is to drive growth in the sector by engaging, influencing and promoting hydropower, tidal range and pumped storage hydro, making these technologies relevant within the Government's ambition to enable a decarbonised, secure grid by 2030.

The Tidal Range Alliance is a collaboration between stakeholders working towards the progression of Tidal Range projects and sits within the British Hydropower Association.
The group was founded to provide additional focus on the potential of Tidal Range and work together to promote the benefits of capturing one of our Island nation's key resources.

For more information, please contact:
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