TIGER - Influencing Economic Policy

The Tidal Stream Industry Energiser Project, known as TIGER, is building partnerships to develop new tidal stream technologies, test and demonstrate them at a number of locations around the Channel region, and use the learning to make a stronger, cost-effective case for tidal energy as part of our future energy mix.

Capital to fund projects

ORE Catapult's 2018 cost reduction report identified that lack of understanding of the technology across the finance and insurance sectors was a component in driving the high cost of capital faced by developers and so a key cost driver in tidal stream Levelised Cost of Energy.

TIGER engagement with the finance community

At the outset of the project, interviews were conducted with the finance community which identified a number of challenges as barriers to investment. During the life of TIGER project, partners have met with the industry to understand their issues and define the challenges associated with accessing capital, equity and insurance. The industry has since made major progress working with TIGER to address each of these issues and as evidenced below, the market has moved forward since TIGER started in 2019.

Challenge: Loss of confidence without revenue support

- With Energy Security and Net Zero now top priorities, the **UK Government demonstrated international leadership in setting a £20m ringfence** in Allocation Round 4 (AR4) of the Contracts for Difference (CfD) scheme in November 2021. Four successful tidal stream projects were awarded contracts in Orkney, the Pentland Firth and Anglesey totalling 40.7MW.
- In 2023 the UK Government continued to show support for tidal stream with a **ringfence of £10m in Allocation Round 5** (**AR5)**.
- In France, the **Government and renewables trade body SER recognised the work being carried out** by TIGER in showcasing the benefits of tidal stream and opened discussions around the eligibility criteria for a Feed-In Tariff (FIT). In May 2023 developer HydroQuest announced they were closing negotiations on a FIT for their Raz Blanchard project.
- **Tidal stream could provide between £5bn and £17bn** Gross Value Added to the UK economy by 2050 (University of Edinburgh, What is the value of innovative offshore renewable energy deployment to the UK economy? September 2021).

Challenge: Offshore wind's aggressive cost reductions have been to tidal energy's detriment

- Tidal stream, via economies of scale, volume, and accelerated learning, is on a similar cost reduction curve as wind and solar. The technology is projected to reach **£78/MWh by 2035** and below £50MWh by 2050 and 10GW of deployment. **At 1GW of deployment tidal stream will be cheaper than new nuclear**. (ORE Catapult, Cost Reduction Pathway of Tidal Stream Energy in the UK and France, October 2022)
- Tidal stream projects have far exceeded offshore wind's UK supply chain content target of 60%: **Nova Innovation and Orbital Marine Power have both achieved more than 80% UK content for site**

construction in their most recent installations. Nova Innovation have gone on to retain 98% of UK content in their operational supply chain. (EU Development Fund Tidal Stream Industry Energiser Project, September 2021)

Challenge: Larger scale projects attract lower cost finance

- The UK has around **11.5GW of practical (accessible) tidal stream capacity** which, when developed, will provide 34 TWh/year of predictable green firm power electricity, equivalent to 11% of the UK's current annual demand. (Royal Society, A review of the UK and British Channel Islands practical tidal stream energy resource, November 2021).
- A report commissioned by the TIGER project on analysis of scale up across other sectors, describes the key manufacturing challenges and considerations that need to be overcome to ensure that the industry can deliver the volumes of devices that are anticipated. (ORE Catapult, Tidal Stream Volume Manufacturing Roadmap, May 2022).
- The Renewables Readiness Assessment (RRA) is a comprehensive tool for assessing the suitability of conditions in different countries for the development and deployment of renewable energy. Designed and refined by IRENA since 2011, the RRA is a country-initiated process that identifies short- and medium-term actions for the rapid up-scaling of renewables. (IRENA, scaling up investments in ocean energy technologies, March 2023).

Challenge: Technology development slow

- University of Edinburgh, 2022 UK Ocean Energy Review sets out **current progress in the tidal stream sector** and key developments, including Nova Innovation's intention to develop a 15MW tidal array in Scotland, Orbital's O2 device reporting a peak power of 2.5MW and what Allocation Round 4 will deliver. Plus: MeyGen site generates the world's first 50GWh of electricity from tidal power, February 2023.
- Tidal stream projects create **76 full time equivalent (FTE) jobs per MW during a project's construction in the UK, and 5.5 jobs/MW/year during operation**. (Element, European Tidal Energy Impact Analysis Report, May 2022).

Challenge: Alternative paths to market

- Tidal stream's predictability can replace the firm power role that fossil fuels currently play in the energy system, reducing costs associated with curtailment and the need for reserve gas capacity caused by supply/demand mismatch. **Modelling carried out by Imperial College London demonstrated that tidal stream alone reduces the UK's required Combined Cycle Gas Turbine (CCGT) capacity by over 40%, from 8.1GW to 4.9GW.** (Imperial College London, Role and Value of Tidal Stream Generation in the Future UK Energy System, February 2022)
- Tidal stream supports a more cost-effective energy system by reducing the amount of energy storage capacity required which will be a key driver of cost in the future energy system. (University of Plymouth, Impacts of tidal stream power on energy system security, September 2022)
- Models the impact of 6.4GW of wave and 6.2GW of tidal stream deployment by 2050 which would lead to a reduction in the annual dispatch cost from £13.54bn to £12.51bn. **This is a saving of £1.03bn per annum for UK households.** (University of Edinburgh, What are the UK power system benefits from deployments of wave and tidal stream generation? January 2023)

Challenge: Insurance

- The Ocean Energy Accelerator (OEA): A proposed financial innovation to stimulate the cascading effect of insurability on bankability to enhance investment through the leveraging effect of risk-averse debt on equity. This document envisages the formation of a protected cell company (PCC) captive insurer as a structure to overcome the failure of the insurance market to provide sufficiently robust insurance products which would enable new ocean energy projects to be demonstrated and commercially deployed. The OEA prospectus has been reviewed by the Marine Energy Council and a group of tidal stream developers have stepped forward, keen to be part of a pilot project. ORE Catapult is now working with developers and key players within the marine insurance sector to scope out the pilot project to run in FY23/24.

Challenge: Investment preparedness and due diligence

- The TIGER project has included real world demonstrations and published scientific research industry reports, specifically the 'Tidal Stream Site Cost Reduction Report', Energy Systems Benefits, Technology Roadmap and Ocean Energy Accelerator reports. These reports not only demonstrate the cost reduction trajectory that can be achieved, but they also show how the **UK and France can generate over 80% of materials from the local supply chain, create up to 45 jobs per MW deployed** – exceeding the wind and solar industries and contributing up to **£17 billion to the UK economy by 2050**.
- Resolution Foundation, The Economy 2030 Inquiry, May 2022: Average returns (on public investments in innovation) in tidal stream is comparatively higher than investment in other renewable technologies. In addition, the return on investment is generated outside of the golden triangle regions.

Conclusion

The TIGER project has addressed many of the economic concerns outlined by the sector at the start of the project. Coordination between the UK Marine Energy Council and the French renewables trade body SER has enabled the exchange of lessons learnt and acknowledgement of best practice. These discussions take into account that the UK tidal market is slightly larger than the French market, which is centred around Brittany and Normandy. Both countries at this stage are keen to grow indigenous capability and they both have eyes on the wider export market across Asia, Canada, Europe and the United States.

At the time of writing (July 2023) both UK and French tidal stream markets are much healthier as a result of the TIGER project, with clear signals of support from UK and French Governments. The TIGER website provides a single publicly accessible repository for key tidal stream data, lessons learnt and best practice - the project has enabled the development of stronger connections with the financial sector and has supported the prospect of tailored insurance cover for projects.

For further information on any of the above initiatives please contact:
simon.cheeseman@ore.catapult.org.uk

www.interregtiger.com