



Wave and tidal stream energy technologies: reducing costs and improving performance

COMPETITION FOR COLLABORATIVE R&D FUNDING

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Summary

The Technology Strategy Board, in partnership with the South West RDA (Regional Development Agency), is to invest up to £9m in innovative collaborative research, development and demonstration in the area of wave and tidal stream energy technologies.

Wave and tidal stream technologies are a priority for the Technology Strategy Board, and we aim to help identify those technologies that will enable the cost-effective exploitation of wave and tidal resources in the UK and globally. Together with the Carbon Trust's Marine Renewables Proving Fund (MRPF) we will help projects meet the criteria necessary to access the Government's Marine Renewables Deployment Fund, fiscal incentives such as the Renewables Obligation, and private investment.

This competition is the first in a series of activities led by the Technology Strategy Board on the research and development of wave and tidal stream energy devices. This competition will address the high-level challenges of:

- **driving down the cost of energy**
- **improving the reliability and performance of devices.**

This competition for collaborative proposals consists of two strands:

- **to enhance the performance of existing devices**
- **to progress novel concept devices.**

Collaborations must be business-led and involve science-to-business or business-to-business interactions.

The competition is open to wave and tidal stream device manufacturers, and also to collaborations that will develop the UK supply chain and the skills needed to deploy these technologies. It complements the September 2010 'Wave and tidal stream

energy technologies: underpinning deployment' competition, which targets full-scale devices installed and operating in the sea (see www.innovateuk.org under Competitions).

Both competitions complement the MRPF, and together they aim to advance wave and tidal technologies along the innovation chain to grow business opportunities and achieve the Government's renewable energy targets.

South West RDA investment is on the basis of its leadership on the low carbon economic agenda, helping South West England's economy build on its designation as the UK's first Low Carbon Economic Area (specialising in marine energy).

Background and challenges

Wave and tidal energy offers promising prospects for the UK, as highlighted in *The UK Low Carbon Industrial Strategy*, published by the Government in July 2009. Because of the UK's natural resources and world leadership in the development of this technology, marine energy could contribute significantly to the UK's targets for renewable energy and it represents a significant economic opportunity for the UK.

Wave and tidal stream technologies are at an early stage of development. They are expected to be a significant part of the UK's renewable energy mix in 2050, with the potential to provide up to 20% of the UK's electricity needs. They are estimated to contribute around 1.3GW to the UK's 2020 renewable energy target.

To fully realise the potential for marine energy in the UK, several technological challenges must be tackled. These range from proving which technological solutions will most successfully harness marine energy, to reducing the cost of the energy produced to make the technology competitive with other renewable energy solutions.

We have identified several areas for investment which will enhance the capacity of UK business to develop and commercialise marine energy, both within the UK and globally.

Scope

This competition will support applied research and experimental development of wave energy and tidal stream devices, addressing the high-level challenges of:

- driving down the cost of energy
- improving the reliability and performance of wave and tidal stream energy generating devices.

Through this competition we will encourage projects that can build on existing UK world-class knowledge, such as that emanating from previous public or privately funded projects, particularly those ready to move from the lower technology readiness levels towards demonstration.

Proposals must explain how the work will help gain a share of the UK and global marine energy markets against other innovative leaders in this field. They should also state how they will enable the UK to achieve its 2020 and 2050 renewable energy targets, and specify what share of the projected 1.3GW of electricity produced from marine energy in 2020 will be attributable to the specific proposal.

The competition is open to wave and tidal stream device manufacturers, and also to collaborations that will develop the UK supply chain and the skills necessary to deploy these technologies.

This single-stage competition consists of two strands: one to enhance the performance of **existing devices**, and the other to progress **novel concept devices**.



Strand 1: existing devices

This strand will cover:

- Existing full-scale devices. Applied research and experimental development to:
 - improve system reliability, installation, operation, maintenance and retrieval methodologies (eg, through the detailed design and development of innovative subcomponents such as powertrain, mooring and structural materials)
 - reduce costs and enhance power capture (eg, through new materials, novel manufacturing and assembly techniques, advanced control systems or innovative power-take-off mechanisms).
- The development of second-generation existing devices that reduce the cost of energy, enhance performance and improve survivability by refining engineering design elements, including device components (moorings, power take off, control mechanisms) and systems performance. Enhanced performances and cost reductions must be referenced to the current device's development status.
- Applied research and experimental development of devices at 1/4 scale or larger, to take forward concepts that have successfully completed a programme of tank testing and detailed techno-economic modelling. These devices must offer evidence of significant advantages compared to existing full-scale devices.

Strand 2: novel concept devices

This strand will support R&D projects for novel concept devices that have already carried out initial desk-based evaluation and have evidence to indicate the concept may have long-term commercial prospects. We will support more detailed techno-economic modelling and evaluation, and laboratory-scale tank testing.

Coordination with other funding bodies

In addition to this joint competition with the South West RDA, the Technology Strategy Board is working closely with other funding bodies such as the research councils, the Carbon Trust, the Energy Technologies Institute, other RDAs and the Department of Energy and Climate Change. Together we will develop a portfolio of projects spanning the innovation chain which will tackle short and long-term challenges relating to climate change and security of supply, while developing significant opportunities for wealth creation in the UK. We expect the successful projects to complement the portfolios of the other funding bodies.

Funding allocation, eligibility and assessment criteria

The Technology Strategy Board and the South West RDA have allocated up to £9m in total to fund innovative collaborative research, development and demonstration projects that address one or more of the areas outlined in the scope. Collaborations must be business-led and involve science-to-business or business-to-business interactions involving a minimum of two partners (one industrial).

Given the international nature of many of the key businesses involved in the low carbon supply chain, non-UK based businesses are eligible to be consortium members, providing there are a minimum of two UK partners (one of which must be a business) and clear quantified benefits to the UK are identified. Although non-UK businesses can participate, they cannot lead the project or receive grant funding.

To be eligible for funding from the South West RDA, at least one partner must be based in South West England. Strong consideration will also be given to proposals that include innovative use of the consented area of seabed at the Wave Hub site in Cornwall.

Strand 1: existing devices

We will fund industry-led collaborative projects normally lasting two to three years that require public sector funding investment of typically £250k to £2.5m, spanning both applied research (attracting 50% public funding) and component or small-scale pilot demonstrations (25% public funding), or a combination of both. Consortia with small and medium-sized businesses might attract a higher percentage of funding and this will be considered case by case. Strand 1 will attract most funding, and projects should aim to implement significant business change within three to five years of the end of the project.

In addition to the criteria in the Guidance for Applicants, projects will be assessed against the following:

- quantified contribution to the UK renewable energy target
- realistic timescale to achieve this contribution
- proof of energy cost reduction and timescale to achieve it
- proof of improved performances compared to competitors
- ability to provide match funding
- track record of project delivery.

Strand 2: novel concept devices

As part of the total programme, up to £1m has been allocated to invest in projects with total costs of up to £500k. We expect these projects to be in applied research (50% public funding).

In addition to the criteria in the Guidance for Applicants, projects will be shortlisted by independent experts before the assessment and then evaluated against the following:

- evidence of potential for significant improvements in cost reduction and efficiency
- evidence of initial desk-based study and independent validation

- appropriateness of the proposed test methodology
- ability to provide match funding
- route map to device scale-up and realistic stage-gate approach.

Definitions of the categories of research are in the Guidance for Applicants, which will be available by **8 March 2010** (see www.innovateuk.org under Competitions).

The Technology Strategy Board and the South West RDA will consider the quality of the proposals in each strand before deciding the final allocation of funding. For both strands, successful applicants may have to undertake more in-depth due diligence and validation of the technology before grant offer letters are issued.

Application process

This single-stage competition opens on **8 March 2010** and applicants must register their intent to submit an application by **22 April 2010**. The application form, including annexes and finance forms, has to be formally received by noon on **29 April 2010**. Following an independent assessment process, applicants will be informed of the decision on **11 June 2010**.

The Guidance for Applicants provides full details of how to complete and submit the application form. A briefing event will be held on **18 March 2010** to explain the application process and competition requirements in more detail. We strongly advise that all applicants attend.

Key dates

Competition opens	8 March 2010
Briefing day	18 March 2010
Registration of intent to submit (compulsory)	22 April 2010
Deadline for receipt of applications	29 April 2010 (noon)
Inform applicants of decision	11 June 2010
New projects workshop	7 July 2010

Further information

For more information about this and other competitions, and details of how to register and apply, please see www.innovateuk.org under Competitions. The Guidance for Applicants will be available online by **8 March 2010**.

Competition helpline:
0300 321 4357

Email:
competitions@tsb.gov.uk

The Technology Strategy Board is a business-led executive non-departmental public body, established by the Government. Its role is to promote and support research into, and development and exploitation of, technology and innovation for the benefit of UK business, in order to increase economic growth and improve quality of life.

The South West RDA leads the development of a sustainable economy in South West England, investing in jobs, supporting business, improving places and creating the conditions for business to prosper.
www.southwestrda.org.uk

Collaborative research and development is part of the Government's Solutions for Business portfolio.

Publicity

The Technology Strategy Board frequently publicises the results of competitions and this includes engagement with the media. All applicants will be given a chance during the competition process to opt out of any publicity. Willing applicants will be asked to provide an agreed form of words for use in publicity material. E-mail pressoffice@tsb.gov.uk with any queries.

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