

THE TECHNOLOGY PROGRAMME
APRIL 2005 COMPETITION FOR FUNDING

Emerging Energy Technologies

Summary

The Government is committed to stimulating the development and utilisation of new and renewable energy sources. These technologies can provide a continuously growing contribution in the competitive energy market, contributing to climate change goals, energy diversity and security.

An indicative £9m of funding has been allocated for Collaborative Research & Development projects in this competition that will ultimately deliver significant energy, environmental and business benefits to the UK.

For this competition, priority has been given to the key underpinning technologies of:

- Intelligent grid management;
- Hydrogen;
- Fuel cells;
- Wave and tidal stream technologies.

Background

Background and Scope for Applications

Fundamental changes to the nature of the UK electricity networks is required in order to meet the challenges of the future. The introduction of new, dispersed generating technologies together with the deployment of significant amounts of intermittent, often remote, renewable sources will over time require major changes to the way our electricity networks are designed, operated and controlled.

The costs and complexity of the changes involved could present a major barrier to the deployment of new generating technologies and the achievement of the government's environmental targets and aspirations. Innovation plays a key role in addressing the challenges of accommodating a radically changed and dispersed generation portfolio with diverse operating characteristics. Responses to these challenges will need to be effective, cost efficient and have the potential to at



least maintain traditional levels of demand security and network resilience.

Proposals are therefore invited which seek to address the technical or commercial implications of connecting significant amounts of dispersed generation (both large and small) to the electricity networks and managing the consequences as seen at both a local network and “system” level. Proposals are also sought which quantify or propose means of dealing with the consequences of connecting large amounts of intermittent generation to the electricity networks. These consequences might include increased reserve of capacity requirements, rapid and significant variations in generator output and power transfers, together with the impact of weather systems etc.

Hydrogen

Hydrogen as an energy carrier offers the potential for zero emissions at the point of use and depending on how it is produced, a virtually zero carbon emission chain. However there are severe techno-economic barriers to the achievement of a hydrogen economy and innovation will be essential to address them. Production, storage, distribution and energy conversion are all areas where cost reduction and enhanced performance are required. The UK has an excellent science base including the UK Sustainable Hydrogen Energy Consortium (UKSHEC), part of the EPSRC Sustainable Power Generation and Supply – SUPERGEN¹ programme.

We would welcome proposals seeking to address one or more of these barriers through research and development. Projects involving collaboration between industry and the science base would be particularly welcome.

This could include areas such as storage (e.g. significant improvements to existing methods such as compressed gas or liquid, or new solid state storage systems); production (higher efficiency small-scale electrolysis or reformation); or systems for rapid vehicle refuelling. This list is for illustration, not intended to exclude proposals dealing with other areas of interest.

Fuel cells

Fuel cells are an enabling technology for the hydrogen economy but also offer increased efficiency and reduced carbon emissions using a range of other fuels. There are various different fuel cell technologies and the Technology Programme does not preclude proposals using any particular technology provided that it is suitable for the proposed application. Proposals should focus on tackling key development issues that affect the commercial prospects for fuel cells. Priority applications include commercial/industrial CHP (combined heat and power), distributed power generation and road transport, but other applications may be considered if they provide a transition pathway to the priority applications.

We welcome proposals for developing and evaluating innovative fuel cell stack and system designs, and key stack and system components with particular emphasis on the UK supply chain.

¹ www.epsrc.ac.uk/ResearchFunding/Programmes/InfrastructureAndEnvironment/Initiatives/SustainablePowerGenerationAndSupplySUPERGEN.htm

Wave and Tidal Stream

Funding is available to develop, evaluate and test wave and tidal stream devices.

Of particular interest will be:

- proposals for design, engineering and cost reduction studies to further develop and improve understanding of existing design concepts (i.e. those already being demonstrated or are close to demonstration). We are looking for rigorous engineering studies that develop a common and robust understanding of the long-term economic potential for these technologies, together with the development of a technical route map for taking forward the development of these concepts;
- proposals involving direct and full collaboration between competitive industrial device development teams to better understand the detailed nature of the temporal and spatial nature of the tidal stream resource, essential for the development of future designs; all the data from this work would be published, for the benefit of the entire industry and academia. We would expect proposals to complement the work of the SUPERGEN Marine Consortium who are already active in this area;
- proposals for the development and evaluation of device concepts that are new to the Technology Programme. Projects should typically involve technical and economic modelling with a view to identifying the optimum set of design parameters for the device that minimises the price of delivered electricity. Proposals should include a clear description of the device together with an explanation of the philosophy behind the design, and what sets it apart from device concepts already under development or in operation. They should also include preliminary estimates of energy output, operation and maintenance costs and cost of energy, together with an explanation of how these were estimated.

Project Details

Projects can range from small, highly focused basic research aimed at establishing technical feasibility, though to applied research, and to experimental development projects configured to produce technology demonstrators. In particular we would encourage projects that can demonstrate benefits to a number of business sectors, and ideally should include at least one partner with defined end-user needs.

Typically a project would have a 1-3 year duration and require DTI support of up to £1m, although larger projects are encouraged where high value for money is demonstrated.

Other funding opportunities

EPSRC is interested in co-funding the academic element of projects in this technology area that demonstrate added value to its existing portfolio; by building on or being complementary to existing research programmes. Applicants who wish to seek research council funding should read the additional guidance provided at www.dti.gov.uk/technologyprogramme

Contact

If you have any queries about this technology area, please contact Jonathan Holyoak at the DTI.

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For general enquiries about the application process please contact the helpline on **01355 272155** or email **info@technologyprogramme.org.uk**

Key Dates

Competition Opens: **25th April 2005**

Deadline for registering your intention to submit an application is: **13th June 2005**

Outline application submission deadline: **20th June 2005**

For details on how to register and apply go to: **www.dti.gov.uk/technologyprogramme**

