Technology Strategy Board
Driving Innovation

Developing High Value Chemicals through Industrial Biotechnology

SEPTEMBER 2009

COMPETITION FOR FEASIBILITY PROJECT FUNDING

BIS Department for Business Innovation & Skills

BIOSCIENCES TECHNOLOGY AREA

Developing High Value Chemicals through Industrial Biotechnology

SEPTEMBER 2009 COMPETITION FOR FEASIBILITY PROJECT FUNDING

Summary

The Technology Strategy Board is running a competition to fund the development and commercialisation of innovative processes that will generate high value chemicals through industrial biotechnology, on behalf of the Department for Business, Innovation and Skills (BIS). An indicative £2.5m is being invested to support feasibility projects, particularly those led by small and medium-sized enterprises (SMEs). Projects should be business-led, either as part of a collaborative consortium or by a single company.

Background and Challenge

In April 2009 the Government's *New Industry, New Jobs* report highlighted a range of new industrial technologies in manufacturing, including industrial biotechnology, in which strong UK capabilities should also be a priority for government attention and support. Industrial biotechnology can contribute significantly to the shift from a chemical industry based on oil, to one based on renewable and biological substances.

The challenge is to develop biosciences-inspired technologies which are:

- cost-competitive
- have improved performance
- can be exploited through new supply chains.

BIS' Industrial Biotechnology Innovation and Growth Team report (May 2009) made a number of recommendations, including developing an open access demonstration facility and establishing an Industrial Biotechnology Fund.

The demonstration plant

The report recommended that the demonstration facility should be established by 2010, with capacity for fermentation of up to 10,000 litres, with associated upstream and downstream facilities. The facility will be not-for-profit and open to any company that wants to use it. It will offer SMEs in particular the chance to trial new processes or technologies that they are not able to do in-house – due to cost or risk. The facility will help businesses use industrial biotechnology to develop and demonstrate proposals into viable products for the market.

BIS is investing £12m towards the creation of the industrial biotechnology demonstration plant on the site of the National Industrial Biotechnology Facility (NIBF) in the North East of England. It is envisaged that this larger scale (10,000 litres) plant will be completed and fully operational by December 2010 with some parts ready for use by June 2010 (assuming there are no construction delays).

The regional development agency, One North East, has earmarked up to £1.5m to secure the day-to-day running of the new plant in the short-term. This new, larger scale plant, together with the existing smaller scale facilities, all at the NIBF site, will help to identify and deliver new processes, materials and products; and help the translation of novel ideas into new products.

The Industrial Biotechnology Fund

The report recommended that an Industrial Biotechnology Fund should be set up by the end of 2009. The fund would provide industry, again focusing on SMEs, with access to demonstration facilities. It suggested £2.5-5m per year is needed for 3-5 years. The successful demonstration of a process, feedstock or material using industrial biotechnology is intended to lead directly to production-level activities (mainly by SMEs) elsewhere in the UK within a 2-4 year timescale.

Through the fund (which is intended to be financially supported through the public and private sector), BIS has allocated £2.5m to support feasibility projects from this 2009 competition.

Scope

We will fund projects looking at how industrial biotechnology can be competitively applied to the production of high value chemicals.

Challenges include replacing existing petrochemically-derived products or novel transformations to create new or cheaper pharmaceuticals. The use of agricultural feedstocks, novel biocatalysts and innovative biotransformation technology offer the potential to develop new, efficient, and sustainable methods of obtaining a significant part of our energy, chemicals and materials needs. Integrating plant and aquatic feedstocks with the power of microorganisms has the potential to drive the development of novel bio-based products to improve health and nutrition, as well as energy and water usage. Industrial biotechnology could lead to using bio-based chemicals and materials to make a wide range of products such as the medical devices, paints, and personal care items that are currently made from petroleum.

The successful demonstration of a process, feedstock or material using industrial biotechnology is intended to lead directly to production-level activities in the UK within a 2-4 year timescale.

This competition aims to stimulate collaboration between industrial biotechnology developers, higher education institutions and in particular, the **chemical sector**. The chemical and chemistry-using sectors are encouraged to use this initiative to pilot industrial biotechnological routes for existing processes or to address new challenges.

This 2009 competition invites proposals addressing the identified challenges with innovative solutions, which demonstrate significant benefit in terms of sustainability

over existing petroleum-based approaches in areas such as, but not limited to:

- platform chemicals
- novel biochemicals
- chemicals for use in health and personal care products
- biodegradable lubricants
- cleaner, more efficient manufacturing of chemicals, including fine chemicals, materials, and active pharmaceutical ingredients
- the discovery and sustainable use of natural products as biologically active ingredients.

Projects that are aimed at making or developing a new process for making, biofuels are **excluded**. But projects that either exploit co-products or by-products of a biofuels processes, or themselves produce co-products or by-products that could be exploited by a biofuels process are **included**.

Feasibility Project Duration, Timing, and Scale

The majority of the projects supported under this 2009 competition will be feasibility projects:

- operating at or below 1,000 litre batch processing capacity
- lasting up to six months
- able to commence in April 2010.

These projects may be run at any of the small scale industrial biotechnology pilot plant facilities around the UK.

Successful feasibility projects, once nearing completion, could then provide a stepping stone for application to the collaborative R&D competition set for autumn 2010. We expect to provide, via the fund, up to £2.5m, to take those successful, high quality projects forward. Under the 2010 R&D competition we will give preference to applicants proposing to use the new large scale demonstration plant at the NIBF.

Under the current 2009 feasibility competition, we may fund a few exceptional feasibility projects lasting longer than six months, and/or operating up to 10,000 litre batch processing capacity. However, any such projects must be completed no later than 31 March 2011 and preference will be given to projects intending to use the NIBF. (In the unlikely event that construction of the new demonstration plant at the NIBF is delayed, access to the plant may not be possible until sometime in early 2011. Any project work carried out by project consortia, under the 2009 competition, that is delayed beyond 31 March 2011 would become ineligible for support.)

Other Application Criteria

Under this 2009 feasibility competition, all applicants must show how their project will make an overall positive contribution in terms of economic, environmental and social impacts – the triple bottom line – taking into account the full product lifecycle.

Most funding is for feasibility studies for short-term (up to six months) projects (attracting up to 75% public funding) with a total project size of up to £200k, particularly those led by SMEs. These studies will be operating at or less than the 1,000 litre processing capacity. Applications can be made by collaborative consortia or single companies.

Applications must:

- be industry-led
- have processes already developed that need demonstration of capability
- be considering entry into their chosen market
- need to conduct small-scale technical feasibility studies
- want to test and develop projects for future larger funding competitions.

Under this 2009 competition, we will also consider exceptionally high quality industry-led project applications which are looking to demonstrate above the 1,000 litre scale and require total project investment of around £200,000-500,000 (under standard collaborative R&D funding rules). We may ask projects requiring investment of more than £200,000 to provide additional information.

Applicants should refer to the Competitions section at **www.innovateuk.org** which provides links to supporting documentation. We require all projects to provide a non-commercially confidential summary, at the start and at the conclusion of the project, for dissemination.

Projects wishing to use the current or planned larger scale facilities at the NIBF (www.uk-cpi.com/3_pages/focus/advanced-processes/services/process-development.htm) should contact the NIBF on 01642 447 278 or NIBF@uk-cpi.com **prior to submission** – for scheduling purposes.

Application Process

The process for this competition is a single stage process. The Guidance for Applicants at **www.innovateuk.org.uk** explains the process in more detail. The key dates for this competition are:

- 18th September 2009 – competition opens
- 6th October – Briefing Day (London)
- 12th October – Open Day at the NIBF, Wilton
- 12th November 2009 – registration of intent to submit
- 19th November 2009 – the last date when an application can be submitted.
- 18th December 2009 – all applicants will be informed of the outcome by this date, following assessment by the independent panel.

The briefing and open days are optional, although potential applicants are strongly advised to attend one of the events if possible.

Key dates

Competition opens	**18th September 2009**
Briefing Day	**6th October 2009**
Open Day at the NIBF	**12th October 2009**
Registration of intent to submit	**12th November 2009**
Deadline for receipt of full applications	**19th November 2009**
Decision to applicants	**18th December 2009**
Projects commence	**April 2010**
Projects end September	**2010***

*Although a few exceptional projects could be of longer duration, but ending no later than 31 March 2011.

Further information

For more information about this and other events, and details of how to register and apply, visit **www.innovateuk.org** under Competitions.

Competition helpline: 01355 272155

Email: competitions@tsb.gov.uk

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. Email pressoffice@tsb.gov.uk with any queries.

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.
See www.innovateuk.org for more information.

The Technology Strategy Board
North Star House
North Star Avenue
Swindon
SN2 1UE

Telephone: 01793 442700

www.innovateuk.org