

Technology Strategy Board

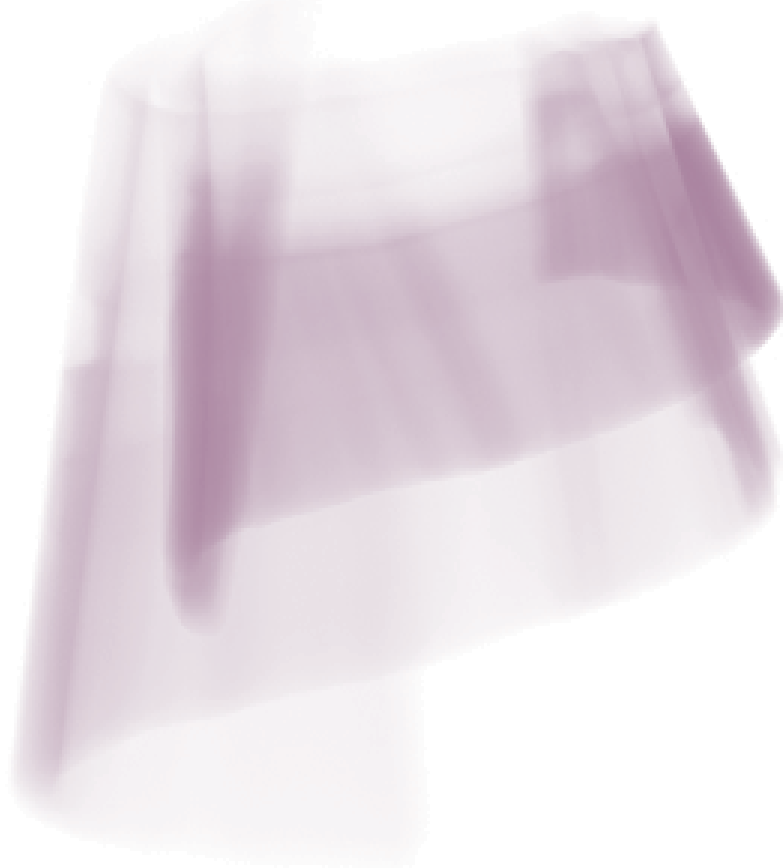
Driving Innovation



Affordable Composites Manufacturing

NOVEMBER 2009

GRAND CHALLENGE: COMPETITION FOR FUNDING



BIS | Department for Business
Innovation & Skills

**ADVANCED MATERIALS AND HIGH-VALUE
MANUFACTURING TECHNOLOGY AREAS**

Affordable Composites Manufacturing

NOVEMBER 2009 GRAND CHALLENGE: COMPETITION FOR FUNDING

Summary

We are launching a grand challenge in the area of composites manufacturing on behalf of the Department for Business, Innovation and Skills (BIS). The competition aims to stimulate the uptake of fibre-reinforced polymer matrix composites, across a range of markets, by inspiring a major leap forward in technologies that go beyond conventional methods, to enable high-performance, high-value products to be manufactured more quickly and affordably.

Up to £6m has been allocated to fund a three-stage competition for feasibility studies, collaborative research and development, and ultimately demonstration of technologies for the cost-effective and rapid manufacture of composites.

There are three stages in the competition:

Stage 1: Interested consortia or individual businesses first submit a Grand Challenge Response outlining their idea.

Stage 2: Successful applicants will then be invited to conduct a feasibility study detailing proposed ideas for the manufacturing process – a total of £500k has been allocated to fund this stage.

Bidders Workshop: All successful applicants present their feasibility work.

Stage 3: The most promising projects from the feasibility studies will then be invited to develop and test their ideas – a total of £500k has been allocated to fund this stage.

Grand Prize: After development and testing, the most outstanding proposal will be awarded £5m to demonstrate its technology.

The challenge is open to industry-led consortia or individual businesses. After each stage proposals will be independently assessed.

Background and challenge

In its April 2009 report *New Industry, New Jobs*, the Government set out its active industrial strategy, proposing improvements in the overall business environment, better recognition of the way that Government decisions can shape markets, and targeted interventions in areas of potential growth. One such area is (polymer matrix) composites.

Advanced manufacturing (manufacturing that employs technologically complex products and processes) is increasingly aiming to exploit the properties and potential benefits of advanced materials, such as fibre-reinforced polymer matrix composites. It is therefore important to enable UK industry to capitalise on the unique properties of advanced composites (for example, to improve performance and make structural components lighter) and to seize the opportunities from a growing global market for new applications.

However, a major barrier to the commercial exploitation of composites across all sectors is the lack of cost-effective and rapid manufacturing processes (most industries worldwide lack the technology to manufacture large structures cost-effectively and in high volumes). The composites industry is limited to low-volume production because the technology to make greater volumes more quickly and cheaply has yet to be developed and validated on a commercial scale. Additionally, changing existing metal-based production lines to test the new technologies may be capital intensive (as well as disruptive to normal operations), and businesses, especially small and medium-sized enterprises (SMEs), lack the funds.

This £6m competition for collaborative research, development and demonstration of fast and affordable manufacture of composites will enable a range of innovative approaches to be explored and shared across industry, leading to a major reduction in the cost and improvement in the speed of manufacturing. For industry,

this will offer the chance to become world leading in this area. It will help companies enter high-volume composite manufacturing at a cost that is not prohibitive and with less risk, especially to SMEs. For example, it will help the UK composites industry develop techniques and processes and train staff to produce potentially high-volume structures, including, but not limited to, aircraft wings, automotive components, larger wind turbine blades, and process equipment that operates in demanding conditions (for example, under high pressure or in a highly corrosive atmosphere).

Scope

The aim of this competition is to develop cost-effective and rapid composite manufacturing techniques for high-performance, high-value products.

Emphasis will be on structural continuous carbon fibre-reinforced polymer matrix composites, exploiting their high strength and stiffness, exceptional strength-to-weight ratios, dimensional stability, improved fatigue strength and impact resistance, and corrosion resistance.

The ability to manufacture complex components reliably and to a high quality will be of major importance. Design for manufacturing development activities will be within the scope of the competition provided that they are part of a fully integrated manufacturing project. Related issues such as non-destructive examination (NDE) and joining (including to metallic components) are not directly within the scope of this competition but should be considered in the context of the viability of proposed manufacturing processes.

We particularly welcome applications that address technologies that can be applied across more than one market sector.

Costs that are eligible for funding include the purchase of capital equipment, the manpower associated with its commissioning, and subsequent



manufacturing development and product prototyping activities.

Project deliverables are anticipated to be demonstrator items and their associated manufacturing processes, which will be presented to a forum of senior representatives from Government and industry.

Application process

The competition is structured in three stages:

Stage 1: Grand Challenge Response

Stage 2: Feasibility studies

Stage 3: Development and testing of concepts.

At each stage, applicants need to focus on addressing the following key issues:

- proposed manufacturing process and products
- consortium structure
- market opportunities (which, size, etc)
- programme deliverables/milestones/timescales
- financial structure (including consortium contributions)
- benefits and risks of proposed approach
- likelihood of success (based upon idea itself and experience of consortium).

Between Stage 2 and Stage 3, a Bidders Workshop will be held to review each of the qualifying Stage 2 submissions and to help establish the strongest consortia and ideas to be taken forward into Stage 3.

Within the Bidders Workshop consortia will present their approach – with all participants required to complete our non-disclosure agreement prior to the event.

There is total funding of £1m available for Stage 2 and 3 activities and it is anticipated these stages will be 75% publicly funded.

At the end of Stage 3 the Grand Prize winner of £5m will be funded on the basis of 50% public funding and so require matched funding from the winning consortium.

Stage 1: Grand Challenge Response

Applicants should aim to provide a compelling, but concise, response to the challenge of this competition, and cover all of the key issues we have outlined.

The Grand Challenge Responses will be independently assessed and ranked against the scope of the competition and the key issues. See the Guidance for Applicants for further details at www.innovateuk.org. The highest ranking responses will progress to Stage 2.

Each applicant organisation may submit up to three responses.

Stage 2: Feasibility studies

We anticipate providing funding of around £15k for each feasibility study outlining proposed ideas for the manufacturing process. Feasibility studies need to be completed by 29th January 2010.

On completion of the feasibility study reports the consortia will attend a Bidders Workshop. The workshop will be used to review each of the qualifying Stage 2 submissions and to help establish the strongest consortia and ideas to be taken forward into Stage 3.

Only consortia willing to share their approach openly in such a forum need submit an application.

The mandatory workshop will be held on 8th-10th February 2010 followed by independent assessment to determine which projects to take forward to Stage 3.

Stage 3: Development and testing of concepts

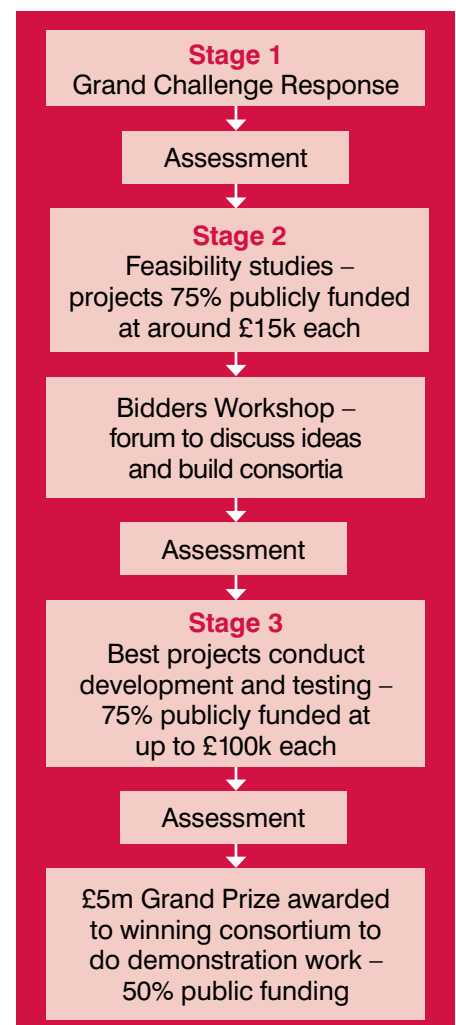
Following assessment the successful consortia will prepare a full stage programme plan for independent assessment. We anticipate funding individual proposal activities up to £100k each (depending on the size and complexity of the proposition). Stage 3 development and testing must be completed by 17th March 2010.

Grand Prize: £5m for demonstration

At the end of Stage 3 a Grand Prize of £5m will be awarded to the winning consortium (to be matched by the consortium).

The winning consortium will have one year to demonstrate its proposal, and must complete the project by 31st March 2011. We require the winner to actively exploit the development commercially.

Applicants should refer to the Competitions section at www.innovateuk.org, which provides links to supporting documentation. The Guidance for Applicants explains the application process in detail. We require all projects to provide a non-commercially confidential summary at the conclusion of the project, for dissemination.





Key dates

Competition launch	26th November 2009
Stage 1 Challenge Response deadline	Noon 18th December 2009
Stage 2 awards to applicants	8th January 2010
Stage 2 submission deadline	Noon 29th January 2010
Workshop	8th – 10th February 2010
Stage 3 awards	17th February 2010
Stage 3 submission deadline	Noon 17th March 2010
Grand Prize awarded	31st March 2010

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

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

Telephone: 01793 442700

www.innovateuk.org