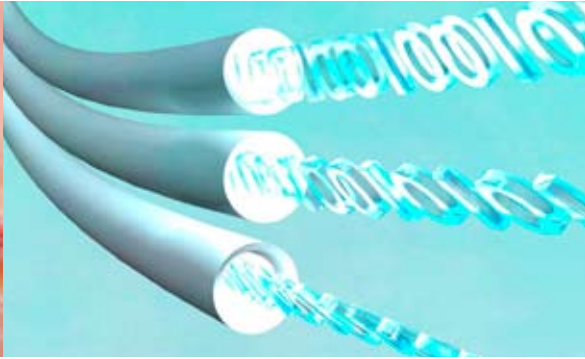


Technology Strategy Board

Driving Innovation



Photonics²¹ – Next Generation Optical Internet Access

NOVEMBER 2008 COMPETITION FOR FUNDING



Photonics²¹ – Next Generation Optical Internet Access

NOVEMBER 2008 COMPETITION FOR FUNDING

Summary

An indicative £1 million of Technology Strategy Board investment is available for Collaborative Research and Development feasibility projects in the area of next generation optical internet access. The intention is to help establish future European collaborations that will participate in larger initiatives such as Framework 7 or the proposed Photonics²¹ ERANET+. Total project costs must be in the range of £30k-100k and the project should last between two and six months. There are two opportunities to participate in this feasibility competition and applications can be submitted into either or both rounds with no preference given to either approach.

The Challenge

The challenge is to identify ways to address the technical challenges facing Next Generation Optical Internet Access in the 2015 to 2020 timeframe and build European collaborations to exploit the technology to generate UK wealth.

Background

High speed internet access is recognised by organisations such as the UK Photonics Leadership Group as becoming increasingly important, as demand for bandwidth increases. Next Generation Optical Internet Access is a big opportunity for business in the UK and Europe, where one of the key issues is how to enable ubiquitous broadband access of at least 1 Gb/s per subscriber within the next decade. Solutions need to be economically scalable to 10 Gb/s, whilst meeting the shorter term needs of system operators and users.

The UK is working with other member states and the European Commission to help develop initiatives in this area (such as the PHOTONICS²¹ ERANET+). Within this context, the Technology Strategy Board is looking to position UK business to investigate innovative technical solutions and build pan-European collaborations that can exploit the market opportunities and be successful in these future European initiatives. PHOTONICS²¹ is a European Technology Platform that identifies photonics opportunities in areas ranging from lighting through to biophotonics and communications. One of the challenges to have emerged from this analysis is the need for cost-effective improvement of the network speed available to end-users. Given the nature of the technology, finding solutions that work across Europe will help to open wider market opportunities than those within single or a few member states.

Enabling an optical infrastructure across the whole of Europe, with true next generation broadband capabilities, will fundamentally change the way that businesses operate and will become a fundamental aspect of worldwide competitiveness. Flexibility in working practices, with an increase in remote working, will evolve, enabled by this communications infrastructure. This will reduce the amount of travel that is required and related carbon emissions. Security and reliability of the network will also be important to ensure that users can depend on the service provided. In addition, the operation and maintenance of current generation networks consume substantial amounts of electricity themselves such that significant energy savings can be made by deploying next generation access technologies, particularly long reach optical networks.

Scope for Applications

All applications must address both the challenge defined by this competition **and** also align with the technical scope defined here in order to deliver **cost-effective** solutions. Applications **must be industrially led** and involve collaboration between at least two organisations; this could be two or more businesses (B2B) or business and universities (S2B). The deliverable will be a report detailing the technical findings (e.g. experimental results, technology definition, roadmaps, future proof architectures etc.) and route to exploitation, including an explanation of the work carried out to construct European collaborations. Projects will be expected to focus on critical issues in the areas below, explaining why they are critical and exactly what impact the successful completion of the project will have.

The technology focus shall be on the components, sub-systems, systems and architectures to achieve the next generation of optical internet access (free-space communications is not included), including transceivers, amplifiers, switching/routing components and manufacturing technology to achieve the required performance and yield. Technology and deployment cost should be considered, given a climate where consumers always require more bandwidth for less. Materials developments will be considered but applications would need to indicate how the full value chain would be constructed to exploit the innovation.



The competition areas are:

- Concepts for access and home networks based on optical fibres for up to 10 Gb/s everywhere provision (FTTP¹, FTTC², PON³, WDM-PON⁴ etc.), focussing on the optical/physical layer of next generation networks, including protocols and management.
- Development of technologies as enablers of future transmission (including coherent technologies), with the capacity to deliver robustness, resilience, reach and bit rate/capacity (through multi-level coding etc.) as well as tuneable/colourless aspects.
- Key switching and component technologies and designs to enable the above, including control aspects and optical hybrids, e.g. polarisation handling and phase discrimination, integrated and hybrid technologies including InP⁵, polymers, OPLLs⁶, VHDWDM⁷, low energy subsystems etc.
- Seamlessly linking access, backhaul and core network architectures, including the architecture convergence with the radio access network to develop wireline/wireless systems integration. An important output would be the definition of future requirements at the component, sub-system and system level, and an evidence based understanding of network traffic that they will support (possibly including network modelling and simulation).

Funding Allocation and Project Details

An indicative £1 million of Technology Strategy Board investment is allocated to Collaborative Research and Development feasibility projects that address the technical challenge and align with the scope described above, involving science-to-business (S2B) or business-to-business (B2B) interactions. The total project costs should be in the range of £30k-100k and it should last between two and six months. An investment of up to 75% of the total project cost will be considered; but a robust case must be made to support the requested amount. The aim of feasibility projects is to encourage exploration of initial ideas to develop them into more tangible applications to secure further development investment, particularly where the participants need to access resources or skills outside of their organisation to take the idea forward. The Guidance for Applicants (via the Competitions link at www.innovateuk.org) defines these categories of research.

To make the competition fair to all applicants, our intention is to allocate 50% of the allocated funds to the first assessment round and 50% to the second round. Unsuccessful applicants from the first round will be eligible to re-apply in the second round utilising the feedback provided by the review panel. The Technology Strategy Board will require all projects to provide a non-commercially confidential summary, at the start and the conclusion of the project, for dissemination.

Application Process

The process for this competition is in line with Technology Strategy Board policy which seeks to give opportunity for applicants to make an initial optional application prior to their compulsory submission. The optional application will be looked at by officials and a response given to applicants within three working days. Applicants may take advantage of this up to one week prior to the application deadline. The key dates for this Competition are, for the first round, the 10th November 2008 when the call opens and the 18th December 2008 when the application must be submitted. For the second round, the dates are the 19th January 2009 and the 26th February 2009.

The Guidance for Applicants explains the process in detail. Following the independent panel review, the Technology Strategy Board will then inform applicants of the outcome. For the first round of applications that will be the 19th January 2009, and for the second round that will be 16th March 2009.

There will be an Information Day for all Technology Strategy Board collaborative R&D competitions in Bristol on 5th November 2008. There will be an optional briefing event for this competition in London on 19th November 2008. These briefings are optional although applicants are strongly advised to attend one of the events.

1 FTTP = Fibre To The Premises

2 FTTC = Fibre To The Cabinet

3 PON = Passive Optical Network

4 WDM-PON = Wavelength Division Multiplexed Passive Optical Network

5 InP = Indium Phosphide

6 OPLL = Optical Phase Locked Loop

7 VHDWDM = Very High Density Wavelength Division Multiplexing



More Information

For more information about this and other competitions and details of how to register and apply, please see Competitions at www.innovateuk.org.

Helpline:
01355 272155

Email:
competitions@tsb.gov.uk

The Technology Strategy Board advises on the selection of priority technology areas and 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
B1 North Star House
North Star Avenue
Swindon
SN2 1JF

Telephone: 01793 442700

www.innovateuk.org

Key Dates

First Round

Competition opens:	10th November 2008
Optional briefing:	19th November 2008
Optional Expression of Interest deadline	10th December 2008
Application deadline	18th December 2008
Decision and feedback to applicants	19th January 2009

Second Round

Competition opens:	19th January 2009
Optional briefing:	4th February 2009
Optional Expression of Interest deadline	18th February 2009
Application deadline	26th February 2009
Decision and feedback to applicants	16th March 2009