

Technology Strategy Board

Driving Innovation



Design for Future Climate: Adapting Buildings

COMPETITION FOR FUNDING

JUNE 2010

LOW IMPACT BUILDINGS INNOVATION PLATFORM

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Summary

We are launching a competition to fund the development of strategies to adapt UK buildings to the changing climate. We will invest up to £2.5m in this first round of the competition. A second round will be held in 2011, with additional funding of up to £2.4m. The programme will be delivered by the Low Impact Building Innovation Platform, which is part of a broader focus on sustainability and low carbon innovation at the Technology Strategy Board.

The construction industry is already working to make buildings more energy efficient, but expected changes in the climate over the next 100 years mean that we will need to adapt our existing and new buildings if they are to cope. There is a significant market opportunity for design teams to develop climate adaptation services to respond to forthcoming changes in standards and regulations.

We are inviting proposals from design teams to develop adaptation strategies for two types of existing large building project:

- planned **low impact new buildings** that are now at the design stage, or
- large non-domestic buildings that are about to be **refurbished to low impact standards**.

Contracts for these building projects should already be in place between the design team and client.

We will award contracts for up to £100k to cover the total costs of developing an adaptation strategy. Design teams will do this by exploring five questions in depth (see 'Funding allocation and project details', p3). At the end of the contract applicants must submit a detailed report of their data, designs and findings, for dissemination by the Technology Strategy Board.

We are inviting applications from single companies only, which will subcontract work to other partners as necessary.

Applicants must submit with their proposal a letter of intent from the client expressing a commitment to participate fully in the design process and to consider implementing recommendations.

Applicants must be in a position to start their work on site by **31 August 2011**. If this is not possible, applicants should enter the second round of the competition in 2011.

The first round of this competition opens on **14 June 2010**.

Background and challenge

The ultimate aim of this competition is to develop the UK's capability for adapting buildings to the challenges posed by the future climate as projected by the UK Climate Impacts Programme (www.ukcip.org.uk).

The climate is changing and this is having an impact on the robustness of buildings to provide habitable indoor environments. We could be faced with:

- a wetter winter and a drier summer in every part of the UK
- a 22% decrease in average summer rainfall in the south east – which is already water-stressed
- an increase of 16% in average winter rainfall in the north west, with increases in the amount of rain on the wettest days leading to a higher risk of flooding
- a rise in sea levels by up to 36cm.

Significant changes are planned for standards and regulations. This competition is in response to the publication on 31 March 2010 of Departmental Adaptation Plans by all government departments¹. These plans set out the key risks, each department's priorities around adapting to climate change, their policies and what they have already done.

1 See www.defra.gov.uk/environment/climate/programme under Adaptation across Government

The commercial lifetime of buildings varies enormously, from 20 years for typical retail units to more than 100 years for some housing and public buildings. The commercial lifetime of components also varies; for example, from 10 years for an internal office fit out to 25 years for a façade. There is a business opportunity in adapting or replacing all existing buildings several times this century as the climate continues to warm to 2100 and beyond.

More and more clients can see the value in maximising their return on investment by adding measures for resilience and resistance to climate change to their design briefs. To minimise the financial risk to clients of refurbishing buildings, building professionals and clients will need to assess the costs, benefits, maintenance and timing of retrofitting adaptation measures – such as adding shading, underpinning foundations, replacing glazing, and building heating, cooling and water systems – and even replacing buildings that are no longer commercially viable.

Designing for higher temperatures

In the extreme drought and heat wave that hit Europe in summer 2003 more than 37,000 Europeans died. One of the main issues was that night-time temperatures remained high, so night-time cooling of buildings did not happen. While this weather was extreme, climate projections published by the UK Climate Impacts Programme indicate that in 2080 we can expect to have more than 100 days each year above 25°C. How can we adapt UK buildings to cope with more than 100 hot days each year without adding massively to the UK's carbon emissions?



Scope

We are inviting proposals to develop adaptation strategies for two types of existing large building project:

- planned **low impact new buildings** that are now at the design stage, or
- large non-domestic buildings that are about to be **refurbished to low impact standards** (domestic retrofit is outside the scope).

Building projects must be worth more than £5m. We will also consider proposals to work on smaller building projects – but only when well justified that the building is part of a programme of repeat commissioning worth more than £5m, and there must be a common design team that can roll out the learning to all buildings in the programme.

All building projects must have low impact goals aimed at a recognised standard such as BREEAM Excellent.

The term 'adaptation' should be interpreted broadly, and the design work should address technologies, systems and processes in the areas of:

- comfort – eg internal temperatures, energy management and indoor environmental quality
- construction – eg foundation stability, resistance to driving rain, fixing methods, resistance of materials to UV, and construction processes
- water management – eg conservation, drainage and flooding.

The behaviour of the building management and occupants also needs to be considered.

We recently commissioned a report detailing the major impacts of climate change on the work of design teams in construction, and this is **essential reading** for all applicants. You can download the report, *Design for Future Climate: Opportunities for Adaptation in the Built Environment*, from our website from **14 June 2010** (see www.innovateuk.org under Competitions).

Funding allocation and project details

We have allocated up to £2.5m in 2010 to fund design work to answer five adaptation questions, which will be disseminated by the Technology Strategy Board. Applicants must be in a position to start their work on site by **31 August 2011**. If this is not possible, applicants should enter the second round of the competition in 2011.

We will award contracts for up to £100k to cover the total costs of developing strategies that answer the five questions. We are inviting applications from single companies only, which will subcontract work to other partners as necessary.

Assessment criteria will include:

- a demonstrable innovative approach
- value for money
- the potential to apply learning to other buildings of this type in the UK.

For successful applicants, we will award contracts to investigate the following questions:

1. What is the current risk exposure for your building/s to the projected future climate?
2. What is the best way to adapt your specific building/s, now and in the future, to improve resistance and resilience to climate change and thus extend the commercial viability?
3. How will you decide when to recommend implementing certain adaptation measures?
4. What is the best way to conduct adaptation work?
5. How can this work be used to extend adaptation of other buildings?

At the end of the contract applicants must submit a detailed **report** of their data, designs and findings for dissemination by the Technology Strategy Board. Further details of contractual obligations for the report contents can be found as an appendix to the contract, available to download from our website from **14 June 2010** (see www.innovateuk.org under Competitions).

The report should include design, redrawing, building control, valuations and quantity surveyor costs. These reports will enable us to compile case studies to raise awareness in the building industry of the need for adaptation, and they will also help us gather evidence to inform upcoming building regulations. The Technology Strategy Board may thus publish and otherwise disseminate all data used. Each of the companies funded by us will own any intellectual property that arises as a by-product of this contract but such companies hereby grant to the Technology Strategy Board an exclusive royalty-free licence to use the data, designs and findings derived from this contract for the purpose of improving standards in the building industry.

In addition, applicants will be contractually obliged to inform us, in confidence, of any recommendations for adaptation their client has implemented or intends to implement that have resulted from the design work. Any information that we gather about the amount spent by clients on adaptation measures will be anonymised and used to show the impact of this competition.

Application process

This is a single-stage competition running over two rounds. Round one opens on **14 June 2010** and closes on **22 July 2010** (noon).

Design teams will need to submit the following with their application form:

- evidence that they already have a contract with a client for a building project on a named building
- a letter of intent from the client expressing their commitment to participate fully and consider recommendations of the adaptation design work
- evidence of low impact goals for the building project aimed at a recognised industry standard, such as BREEAM Excellent.



Companies can apply to design a strategy for more than one building project – in this case a separate application form must be submitted for each project.

Details of the application process, finance and funding levels, and application criteria including timelines will be provided in the Guidance for Applicants. Applicants should also read the report *Design for Future Climate: Opportunities for Adaptation in the Built Environment*. These documents will be available on our website from **14 June 2010** (see www.innovateuk.org under Competitions).

We also encourage potential applicants to attend a briefing event that will be held in London on **23 June 2010**.

Further information

For more information about this competition and details of how to register and apply, please see **www.innovateuk.org** under Competitions.

Key dates

Competition opens	14 June 2010
Applicants briefing (optional)	23 June 2010 – London
Deadline for receipt of applications	22 July 2010 (noon)
Decision to applicants	20 August 2010
Feedback to applicants	17 September 2010

The Guidance for Applicants, draft contract, a summary of the regulatory framework and the report *Design for Future Climate: Opportunities for Adaptation in the Built Environment* will be available when the competition opens on **14 June 2010**.

Competition helpline:
0300 321 4357

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. E-mail 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.

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