

Technology Strategy Board

Driving Innovation



Building performance evaluation

**COMPETITION FOR FUNDING
MAY 2010 – 2012**

Building performance evaluation

COMPETITION FOR FUNDING

Summary

The Technology Strategy Board has committed up to £8m to fund the costs of building performance evaluation studies on domestic and non-domestic buildings.

We will be funding individual companies and other organisations responsible for buildings for the total cost of evaluating the performance of case study buildings they design, build, own and/or operate.

We will be funding two types of study for **domestic** buildings – Phase 1 and Phase 2, covering 'post completion and early occupation' and 'in-use and post occupancy' respectively. Similarly, there will be two categories of study for **non-domestic** buildings, one for buildings under construction, and one for those in operation and no more than three years old.

Applicants will benefit directly through the involvement of expert building performance evaluators who will help them to determine how their buildings perform, and why. Longer term generic learning from across the studies will help the sector as a whole deliver more efficient, better performing buildings.

Funding will be allocated in tranches at intervals over two years, with the final closing dates for applications being 18 January and 23 May 2012 for non-domestic and domestic projects respectively.

Background and challenge

The UK Government has set challenging targets for improving sustainability and limiting anthropogenic climate change, starting with the goal of achieving an 80% reduction in carbon dioxide emissions in the UK by 2050, with an intermediate goal of 26% by 2020 compared to 1990 levels.

About 45% of the UK's CO₂ emissions come from buildings, and the Technology Strategy Board's Low Impact Building Innovation Platform is running a number of competitions for funding to stimulate

innovation towards achieving these goals while simultaneously improving the competitiveness of UK companies.

A key challenge is to ensure that building designs lead to physical buildings that perform as intended.

There is typically a significant discrepancy between the predicted energy performance of a building (and hence its CO₂ emissions) and its performance in practice. The base energy requirement of a building is up to twice that predicted, neglecting energy used as a result of the activities undertaken in the building, and when these additional uses are taken into account the energy required can easily be as great as four times that predicted.

These discrepancies arise from a variety of sources, ranging from the design and modelling tools used in the design of the building, through buildability, build process and build quality, systems integration and commissioning, handover and operation, to the understanding, comfort and motivation of occupants.

In 2009 the Low Impact Building Innovation Platform awarded funding to deliver improved design and decision tools as a significant step in equipping design teams with the means to deliver low impact building designs. This competition is a further important piece of the jigsaw, enabling the industry as a whole, and especially those responsible for the selected case study buildings, to understand the performance of different building types, design strategies, construction methods and occupancy patterns, and the relative contribution of various factors to the eventual performance of the building.

While this information will be of direct short-term value to successful applicants, longer term benefits will accrue to the whole sector through the collation, analysis and dissemination of performance data and associated case study reports produced through the Building performance evaluation programme.

Scope

This competition comprises two separate streams, one for **domestic** and one for **non-domestic** buildings, recognising their differences in procurement, delivery, tenure, operational characteristics and current practices for predicting and evaluating building energy performance. Domestic projects must be new build and non-domestic projects can be new build or, under certain circumstances, major refurbishment. For domestic buildings, Phase 1 studies will cover 'post completion and early occupation', and Phase 2 studies 'in-use and post occupancy evaluation'. For non-domestic buildings, studies will be categorised as 'buildings under construction (and nearing completion)' or 'in operation'.

Project eligibility for each tranche will depend on the practical completion date for the building or development, as indicated at the end of this document.

Domestic buildings

Approximately three-fifths of the UK's building-related CO₂ emissions come from domestic buildings. There is currently a national requirement that all new homes built from 2016 onwards are to be zero carbon.

We would like to see applicants from organisations of all sizes, for studies ranging in scale from individual units to multi-unit developments. Applications may focus on a single dwelling or dwelling type, be comparative studies between substantially identical dwellings where the impact of specific attributes or variables is of interest, or where the applicant is anticipating making changes to the design or delivery of future units based on the findings of initial studies.

Phase 1 studies will typically be carried out within a 3-6 month window, spanning practical completion and early occupation. Phase 2 studies will typically follow Phase 1 projects, although some may 'stand-alone' or precede construction of subsequent phases of a development. Phase 2 studies will last approximately two years to enable energy monitoring over two heating seasons.



For applications to be 'in scope' the applicant must confirm they can provide information appropriate to the stage of completion at the time of application, on the design and construction of the dwelling(s) to demonstrate the design intent and the way in which this has been or is being implemented. For Phase 2 studies, applicants must be able to collect information on energy performance and occupant feedback as required by the study and in accordance with the specified protocols and techniques.

Non-domestic buildings

Approximately two-fifths of the UK's building-related CO₂ emissions come from non-domestic buildings, and the UK Government has declared its ambition for all new non-domestic buildings to be carbon neutral by 2019.

Non-domestic buildings are typically larger than individual dwellings, have more complex facilities management and are host to a wide variety of activities and occupancy patterns. They also come into being through procurement processes involving numerous design and construction specialists.

We aim to fund the evaluation of non-domestic buildings which provide good potential to determine how buildings perform in relation to their predicted performance and why.

Suitable case study buildings may serve a particular sector – such as commercial, retail, leisure or healthcare – and contribute to learning about the particular characteristics of building performance in that sector.

Alternatively, they may typify specific procurement routes or design strategies.

Applicants may include, for example, designers, construction companies, developers, property managers and/or occupants, and they should have some responsibility for the performance of the building they wish to study.

The competition is also open to companies undertaking major refurbishment of older non-domestic buildings where a core objective is to improve the energy performance of the building significantly.

Suitable case study buildings will be either nearing completion (within nine months) or newly occupied (no more than three years post completion), as detailed in the tables overleaf.

Applicants will need to have both the authority and the ability to provide original design information, performance predictions, and information on the construction process, hand-over and operation, as well as the authority to collect additional data during the course of the case study.

If you have any specific queries about the scope of this competition please email your questions to: support@innovateuk.org.

Looking for building performance evaluation experts to work on your project? Go to the register on the **_connect** web group for Building Performance Evaluation at <https://ktn.innovateuk.org>.

Study details

It is expected that applicants will engage the services of expert building performance evaluators to assist their in-house team in studying the candidate building to understand how it performs and why.

Applicants may use experts and specialist service providers already known to them, or may refer to the register on the **_connect** web group for building performance evaluation at <https://ktn.innovateuk.org>.

To provide maximum benefit to applicants and to the sector as a whole, a range of standard procedures, protocols and techniques has been identified for use by applicants and their building performance evaluators. These cover the evaluation of a wide range of factors including:

- fabric performance
- energy performance
- services design, installation and performance
- occupant perception and satisfaction.

All studies will conclude with a full feedback and debriefing workshop, involving the building performance evaluator, to maximise learning for applicants and their direct stakeholders.

Application process

This competition will run over two years, with tranches at approximately four-monthly intervals. Each tranche will be open to applicants for both domestic and non-domestic buildings, with the last tranche open to single stage application for domestic projects and invited full stage applications for non-domestic projects (ie, those that have been successful at initial application stage).

For **domestic** projects the competition follows a single stage process. Applicants should also read the relevant *Guidance for Applicants* and *Guide to Project Execution*.

For **non-domestic** projects the competition is a two-stage process. Applicants should submit an initial proposal using the standard form available on our website and also read the *Guidance for Applicants* and *Technical Guide*.

Applicants for non-domestic studies who are successful at the initial proposal stage will then need to provide further information about the building to be studied, using a prescribed spreadsheet. This will be used by a building performance evaluator assigned by the Technology Strategy Board to undertake an initial study which will provide the applicant with useful early evaluation feedback and inform the proposal for the full project. The applicant will then progress to a full-stage application.

All documents are available at www.innovateuk.org after you have registered for this competition, and any revisions to the deadlines will be posted on our website under Competitions.

Note that ALL deadlines are at 12 noon.

Key dates

Tranche 4	
Competition opens	14 February 2011
Registration deadline	4 May 2011 noon
Application deadline	11 May 2011 noon
Applicants notified	8 June 2011
Tranche 5	
Competition opens	20 June 2011
Registration deadline	7 September 2011 noon
Application deadline	14 September 2011 noon
Applicants notified	11 October 2011
Tranche 6	
Competition opens	24 October 2011
Registration deadline	11 January 2012 noon
Application deadline	18 January 2012 noon
Applicants notified	14 February 2012
Tranche 7 – Domestic single stage, and non-domestic full stage applications previously approved at initial stage.	
Competition opens	27 February 2012
Registration deadline	16 May 2012 noon
Application deadline	23 May 2012 noon
Applicants notified	20 June 2012

Further information

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

Access to competition information will be available during the two-year open period, through information events, surgeries, webinars and downloadable documentation.

Ad hoc support is also available from the Modern Built Environment KTN at **<https://ktn.innovateuk.org/web/modernbuiltktn>**. A dedicated web group for those interested in building performance evaluation can be found at **<https://ktn.innovateuk.org/web/building-performance-evaluation>**.

Competitions helpline:
0300 321 4357

Email:
support@innovateuk.org

Publicity

The Technology Strategy Board frequently publicises the results of competitions and this includes engagement with the media. 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.

Eligibility criteria

For **domestic** buildings to be eligible for study they must be scheduled for practical completion no later than six months after, or be no more than two years old with respect to the closing date for applications in the tranche for which they are applying. For example, tranche 4 buildings must be completed between 12 May 2009 and 11 November 2012.

For **non-domestic** buildings to be eligible for study they must be scheduled for practical completion no later than nine months after, or be no more than three years old with respect to the closing date for full applications in the tranche for which they are applying. Please note that full application closing dates coincide with the initial application closing dates for the subsequent tranche, eg, tranche 4 closes for initial applications on 11 May 2011 and for full applications on 14 September 2011. Buildings must therefore be completed between 15 September 2008 and 14 June 2012.

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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