

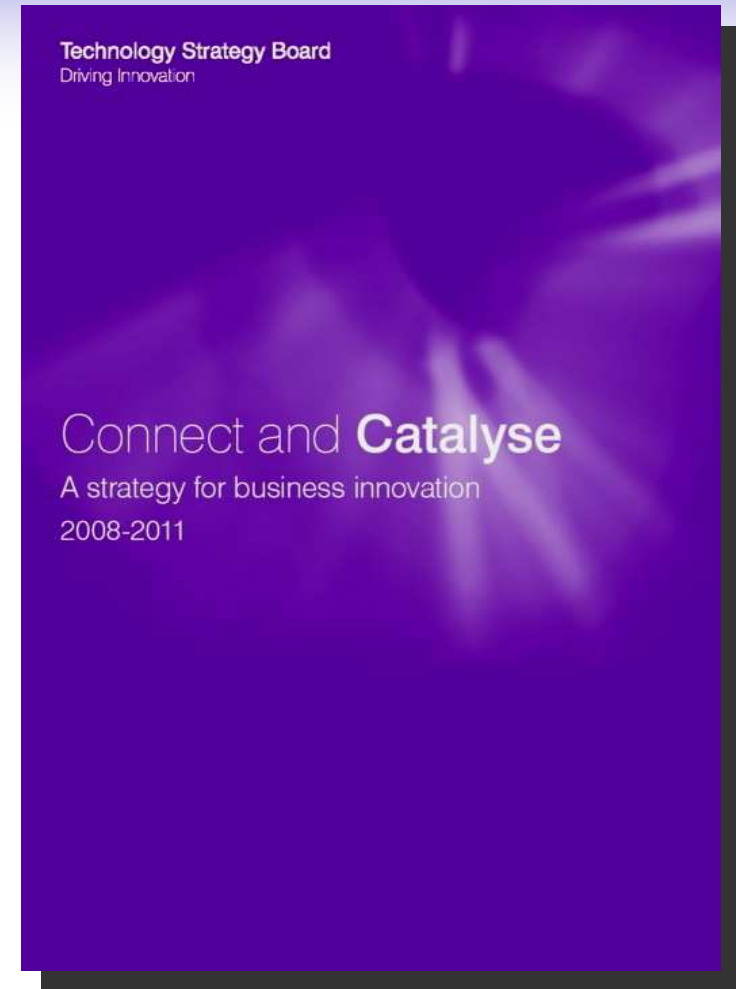
Building Performance Evaluation

*An £8 million research programme by the
Technology Strategy Board*

Roderic Bunn, BPE Assessor, BSRIA

Technology Strategy Board strategy...

Connect and Catalyse



www.innovateuk.org/assets/pdf/corporate-publications

Low Impact Building Innovation

2008

Components & materials

£3m CR&D programme

Design & decision tools

£4m CR&D programme

2009

Retrofit for the future

£17m SBRI

Energy efficient Whitehall

£2.75m SBRI

2010

User-centred design

£2m Sandpit

Building Performance Evaluation

£8m open programme.

Design for future climate

2011

Build Process

Management & operation

Integration of low carbon energy

What are the TSB's key objectives?

- **An 80% reduction in carbon emissions by 2050** *Buildings account for 45% of total UK carbon emissions*
- **A deeper understanding of the performance of buildings in use** *Currently highly variable and does not match predictions*
- **A better grasp of the variables that affect building performance** *looking at design, construction, handover and operation in order to understand cause and effect*
- **Share the understanding of the technical and process factors that affect performance** *Building BPE skills and capacity in the industry, improving design, procurement, construction, commissioning and handover procedures*
- **Promoting the use of feedback as a routine professional activity** *for briefing, design and post-occupancy evaluation*

Foster's academy building is a nightmare, says school's boss

27 September 2010 | By [Will Hurst](#)

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A flagship academy school, designed by Foster & Partners, has been branded a "nightmare" by the woman who runs it.

The £31 million Business Academy Bexley, a 2004 Stirling Prize nominee in south-east London, was the UK's first city academy, and was opened by former prime minister Tony Blair seven years ago this month.

But it has been hit by a catalogue of maintenance problems, and the school's chief executive Sam Elms said this week that if she had her way she would move the school into a building more suitable for teaching.

The constant problems have meant the school's deficit could now rise from the current £500,000 to more than £850,000 next year, according to the Times Educational Supplement.



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A new academy somewhere up North...



Energy Performance Certificate
Non-Domestic Building

HM Government
Certificate Reference Number: 0885-3092-0380-0790-5291

This certificate shows the energy rating of this building. It indicates the energy efficiency of the building fabric and the heating, ventilation, cooling and lighting systems. The rating is compared to two benchmarks for this type of building: one appropriate for new buildings and one appropriate for existing buildings. There is more advice on how to interpret this information on the Government's website www.communities.gov.uk/epbd.

Energy Performance Asset Rating

More energy efficient

A+

Net zero CO₂ emissions

A 0-25
B 26-50
C 51-75
D 76-100
E 101-125
F 126-150
G Over 150

Less energy efficient

47 This is how energy efficient the building is.

Technical information

Main heating fuel: Natural Gas
Building environment: Heating and Mechanical Ventilation
Total useful floor area (m²): 10633.636
Building complexity (NOS level): 5

Benchmarks

Buildings similar to this one could have ratings as follows:
62 if newly built
107 if typical of the existing stock

Total useful floor area m²: 10633.636

Display Energy Certificate
How efficiently is this building being used?

HM Government
Certificate Reference Number: 0950-7998-0140-8060-2020

This certificate indicates how much energy is being used to operate this building. The operational rating is based on meter readings of all the energy actually used in the building. It is compared to a benchmark that represents performance indicators of all buildings of this type. There is more advice on how to interpret this information on the Government's website www.communities.gov.uk/epbd.

Energy Performance Operational Rating

More energy efficient

A 0-25
B 26-50
C 51-75
D 76-100
E 101-125
F 126-150
G Over 150

Less energy efficient

106 100 would be typical

Technical information

This tells you technical information about how energy is used in this building. Consumption data based on actual meter readings.

Main heating fuel: Natural Gas
Building environment: Heating and Mechanical Ventilation
Total useful floor area (m²): 10493
Asset Rating: 47

Administrative information

This is a Display Energy Certificate as defined in SI 2007/991 as amended.

Assessment Software: GJA, GCRG, v3.0.1
Property Reference: 7348260000
Assessor Name: Sorely Youngman
Assessor Number: 69620008
Accreditation Scheme: N/A
Employer/Trading Name: Global Technical Services Limited
Employer/Trading Address: 7, Broadfield, Moulton Park, Northampton, NN4 6PL
Issue Date: 27-07-2010
Nomination Date: 29-06-2010
Valid Until: 18-06-2011
Related Party Disclosure: Indirect relation to the occupier
Recommendations for improving the energy efficiency of the building are contained in the accompanying Advisory Report.

Total useful floor area m²: 10493



The built environment experts

Key Facts 1

- **£8 million Technology Strategy Board funding** *four year programme, with extension of funding for interesting buildings*
- **Looking for single company applications** *preferably from building owners and developers – but can be fronted by a supply chain member*
- **Projects should be case study investigations of candidate buildings or developments** *buildings can be batched, but good justification needed*
- **Specific findings must be of benefit to applicants and building owners** *Generic findings will widely disseminated (no strategy yet...)*
- **Full funding awarded for monitoring and evaluation activities** *not for construction*

Key Facts 2

- **Competition open from May 2010 for approximately two years**
- **Rolling competition with assessment of applications at approximately quarterly intervals**
- **Open to domestic new build and non-domestic new build and major refurbishment**
- **Potential follow-on studies** *to evaluate changes in design, construction practice, operating strategy*
- **Monitoring and evaluation must be completed by 2014**
- **BSRIA's Roderic Bunn and Peter Tse nominated BPE assessors to the TSB** *assessing bids and available as project field researchers*

The typical evaluation package

- **Assessment of annual energy use**
- **Analysis of energy demand profiles**
- **An occupant satisfaction survey**
- **Investigation of issues arising (especially where there is unusually good, poor or variable performance)**
- **Spot checks and recording measurements as necessary**
- **Technical review of building and equipment performance**
- **Review of the performance and usability of controls and BMS**
- **Reliability, maintenance and maintainability**
- **Structured reviews with occupants and management**
- **Suggestions for improvement**

Post-construction and initial occupation

- Typically carried out within a three-month window, spanning practical completion and early occupation.
- Process evaluation and design and construction audit
- Fabric performance testing *Co-heating tests, thermographic survey*
- Services performance testing *Some physical monitoring*
- Hand-over processes and initial occupant studies *interviews*
- Evaluation and interpretation of data and information captured
- Comparison with design performance



In-use performance and post-occupancy evaluation

- Typically follows a related Phase 1 study.
- Approximately two years duration
- **Post-occupancy evaluation** *using occupant surveys and observations*
- **Monitoring of internal and external conditions** *such as temperature, humidity, CO₂*
- **Assessment of energy consumption** *and generation*
- **Assessment of services performance**
- **Evaluation and interpretation of data and information captured**
- **Comparison with design performance**



Non-domestic projects – general approach

- **Initial study undertaken by a Building Performance Evaluator** *assigned by the Technology Strategy Board.*
- **Review of design, construction, operation and occupancy information** *as submitted by the applicant*
- **Completion of a pre-visit questionnaire**, *capturing design information, and initial operational data such as hours of occupation and energy consumption*
- **A building visit and discussion with applicant and relevant stakeholders**
- **Workshop with bidder to refine the application** *and ensure independence of research team through assigned roles and responsibilities*
- **A feedback report to TSB and the bid team** *including recommendations for further study*
- **Assessment of the final application by the TSB** *Award of research funding if successful*

Non-domestic projects –in construction/early occupation

- **Review of design data and metering strategy**
- **Inspection of build quality**
- **Review of the arrangements for managing delivery of design intent**
- **Review of sign-off and commissioning plans and procedures**
- **Review of plans for occupation**
- **Review of test results** *such as air pressure tests, commissioning records*
- **Review of handover information** *data, staff training, familiarisation*
- **Review of technical performance,** *occupant satisfaction, management and energy use during the six months after handover*
- **Capture findings and identify possibilities for improvement**
- **Results** *workshop with members of the client, occupier, design and building teams*

Non-domestic projects – in-use studies

Technical

- **At least two years of energy use data** *for benchmarking purposes*
- **Assessment of annual energy use and energy demand profiles**
- **Spot-checks and recording measurements as necessary**
- **Performance and usability of controls and the BMS**
- **Technical review of building and equipment performance**

Behavioural

- **An occupant satisfaction survey**
- **Assessment of maintenance and maintainability, and manageability**
- **Structured reviews with occupants and management**

Process

- **Understanding of how the procurement process influenced building performance**

Technology Strategy Board

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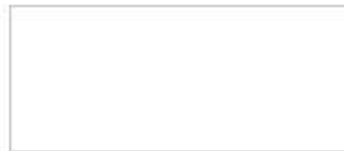
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Procurement



Technology Strategy Board

Building Performance Evaluation

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. This will help builders and developers to deliver more efficient, better performing buildings.

Status:

Open

Download the brief

Building Performance Evaluation Brief May Competition



[Click to start download](#)

Application process & supporting downloads

[Register for Building Performance Evaluation Round 2 - Domestic](#)

[Register for Building Performance Evaluation Round 2 - Non Domestic](#)

www.innovateuk.org/content/competition/building-performance-evaluation-.ashx

Next application deadlines

- 13 October 2010
- 12 January 2011

Technology Strategy Board www.innovateuk.org

Modern Built Environment KTN www.mbektn.co.uk

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