BREEAM

5th Lecture

Come away with me

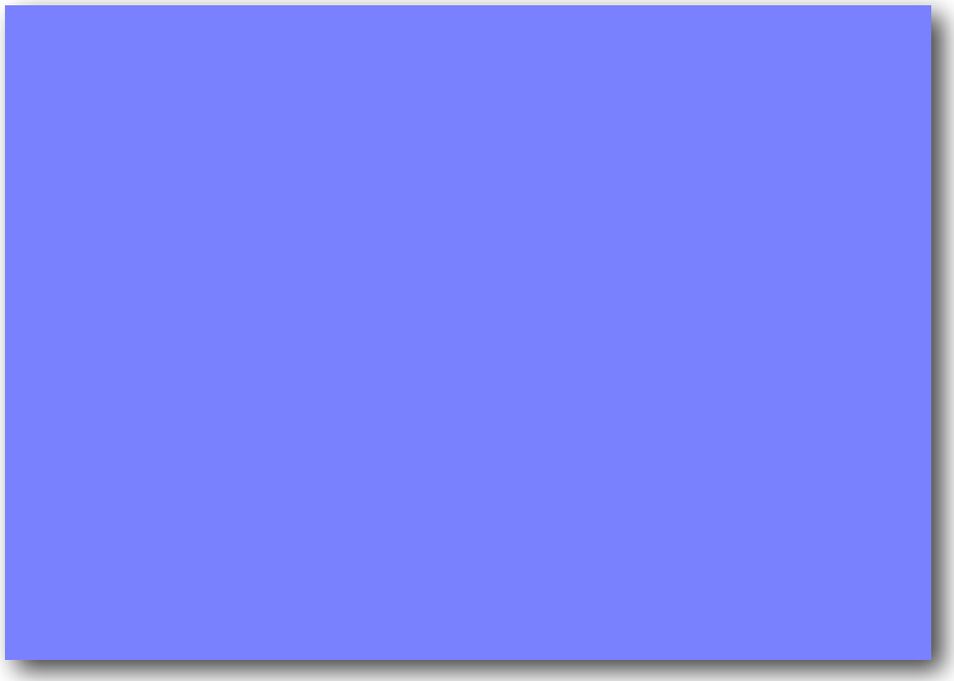
Norah Jones

Norah Jones(born **Geethali Norah Jones Shankar**; March 30, 1979) is an American singer-songwriter, pianist, and actress.

In 2002, she launched her solo music career with the release of the commercially successful and critically acclaimed album *Come Away with Me*, a fusion of jazz, pop, and country music, which was certified diamond album in 2002, selling over 26 million copies, The record earned Jones fiveGrammy Awards, including the Album of the Year, Record of the Year, and Best New Artist.

Her subsequent studio albums, *Feels Like Home*, released in 2004, *Not Too Late*, released in 2007, the same year she made her film debut in *My Blueberry Nights*, and her 2009 release *The Fall* all gained Platinum status, selling over a million copies and were generally well received by critics. Jones' fifth studio album, *Little Broken Hearts* was released on April 27, 2012.

Jones has won nine Grammy Awards and was *Billboard* magazine's 60th-best-selling music artist of the 2000–2009 decade. Throughout her career, Jones has won numerous awards and has sold more than 50 million albums worldwide. *Billboard* named her the top jazz artist of the 2000–2009 decade, establishing herself as one of the best-selling artists of all time.

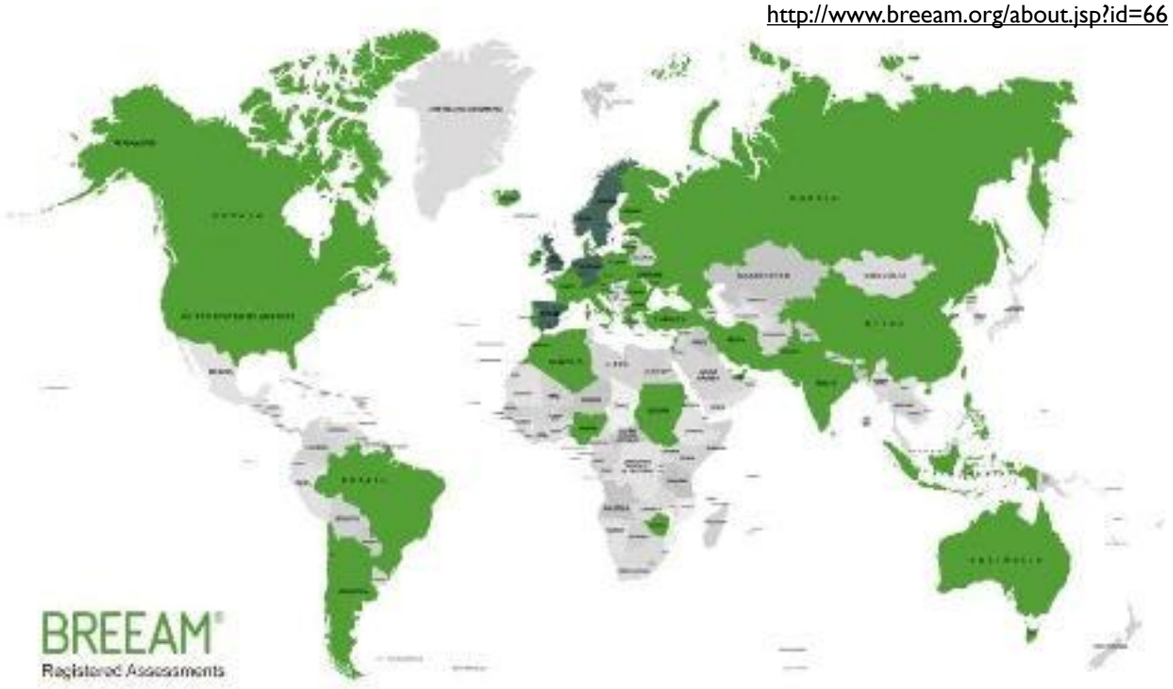


BRE Environmental Assessment Method (BREEAM) is a voluntary measurement rating for green buildings that was established in the UK by the Building Research Establishment (BRE).

Since its inception it has grown in scope and geographically, being exported in various guises across the globe.

- LEED : North America
- Green Star : Australia
- HQE : France

http://www.breeam.org/about.jsp?id=66

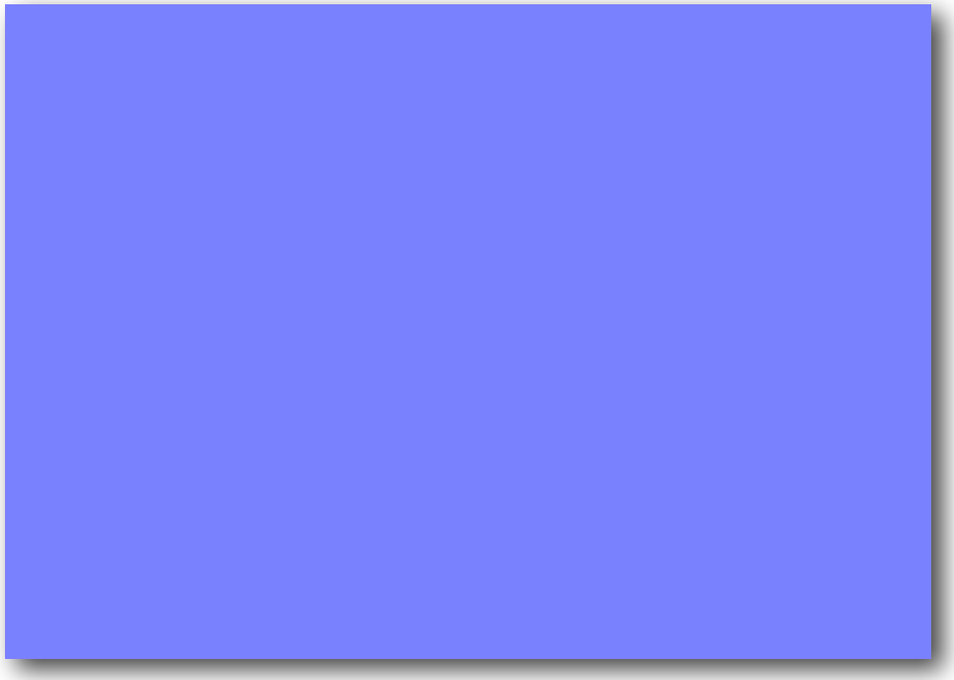


What is BREEAM?

BREEAM is the world's foremost environmental assessment method and rating system for buildings, with 200,000 buildings with certified BREEAM assessment ratings and over a million registered for assessment since it was first launched in 1990.

BREEAM sets the standard for best practice in sustainable building design, construction and operation and has become one of the most comprehensive and widely recognised measures of a building's environmental performance.

A BREEAM assessment uses recognised measures of performance, which are set against established benchmarks, to evaluate a building's specification, design, construction and use. The measures used represent a broad range of categories and criteria from energy to ecology. They include aspects related to energy and water use, the internal environment (health and well-being), pollution, transport, materials, waste, ecology and management processes.



A certificated BREEAM assessment is delivered by a licensed organisation, using assessors trained under a UKAS accredited competent person scheme, at various stages in a buildings life cycle. This provides clients, developers, designers and others with:

market recognition for low environmental impact buildings,
confidence that tried and tested environmental practice is incorporated in the building,
inspiration to find innovative solutions that minimise the environmental impact,
a benchmark that is higher than regulation,
a system to help reduce running costs, improve working and living environments,
a standard that demonstrates progress towards corporate and organisational environmental objectives.

What does BREEAM do

BREEAM addresses wide-ranging environmental and sustainability issues and enables developers, designers and building managers to demonstrate the environmental credentials of their buildings to clients, planners and other initial parties, **BREEAM**:

uses a straightforward scoring system that is transparent, flexible, easy to understand and supported by evidence-based science and research,
has a positive influence on the design, construction and management of buildings,
defines and maintains a robust technical standard with rigorous quality assurance and certification.

Who uses BREEAM

Clients, planners development agencies, funders and developers use BREEAM to specify the sustainability performance of their buildings in a way that is quick, comprehensive, highly visible in the marketplace and provides a level playing field.

Property agents use it to promote the environmental credentials and benefits of a building to potential purchasers and tenants.

Design teams use it as a method to improve the performance of their buildings and their own experience and knowledge of environmental aspects of sustainability.

Managers use it to reduce running costs, measure and improve the performance of buildings, empower staff, develop action plans and monitor and report performance at both the single building and portfolio level.

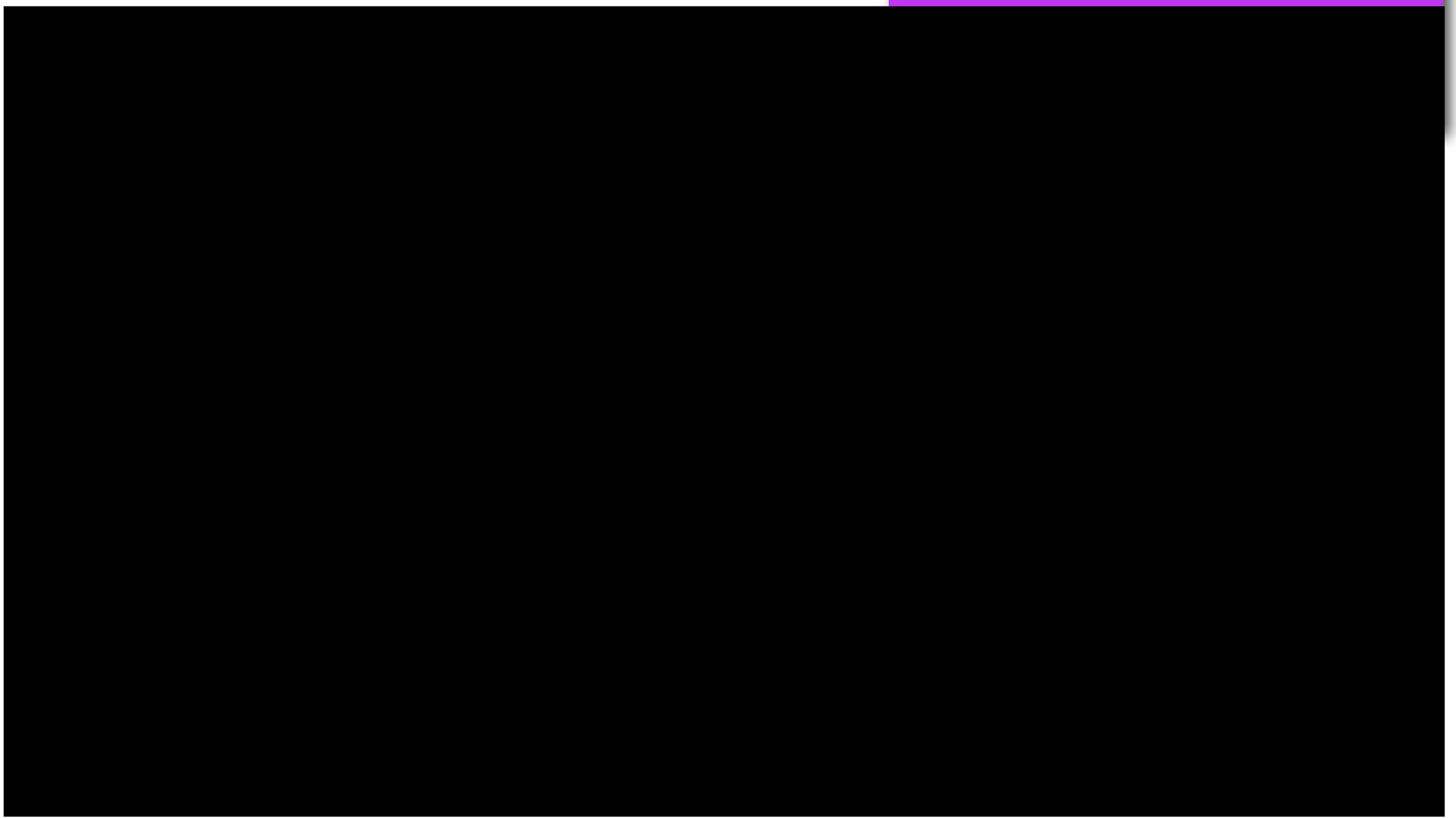
BREEAM Certified Buildings

http://www.greenbooklive.com/search/scheme.jsp?id=202

This section of GreenBookLive provides a listing of the buildings that have been certified under BREEAM 2008 onwards - excepting a small number of buildings which cannot be listed for client confidentiality reasons. It also includes buildings certified by National Scheme Operators under BREEAM affiliated schemes.

Metal That Breathes

Doris Kim Sung



History

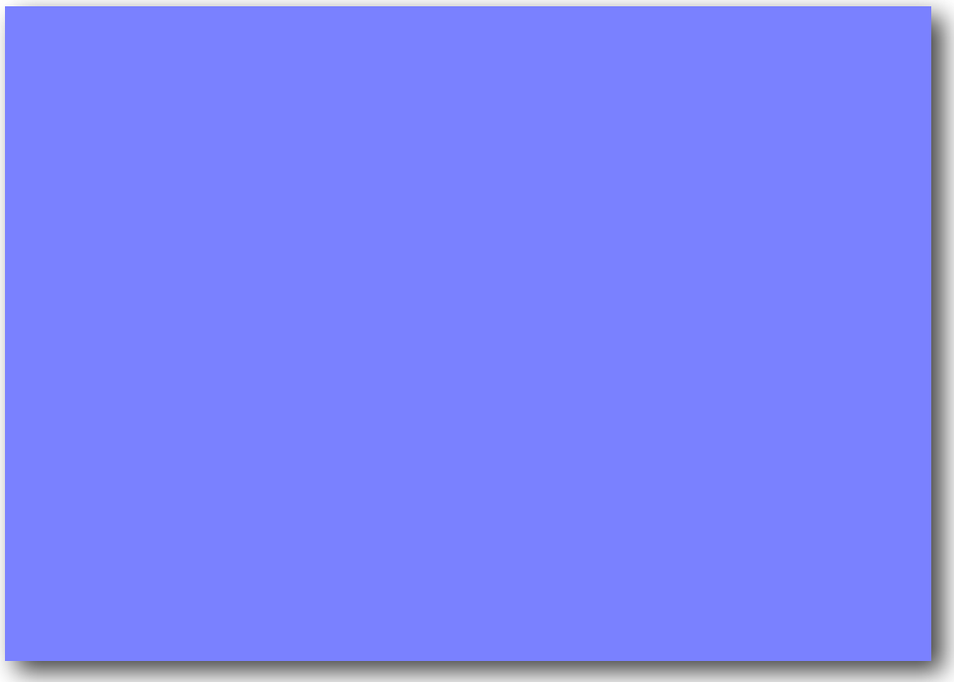
BREEAM (the Building Research Establishment Environmental Assessment Method) started life in 1990 as an assessment scheme for new offices. The first document was very small compared with BREEAM today, just 20 pages, looking at a handful of issues split into these categories:

Global Effects

- Greenhouse gases (carbon dioxide emissions)
- Ozone depletion (refrigerants and CFCs)
- Wood products
- Recycling of materials

Neighbourhood Effects

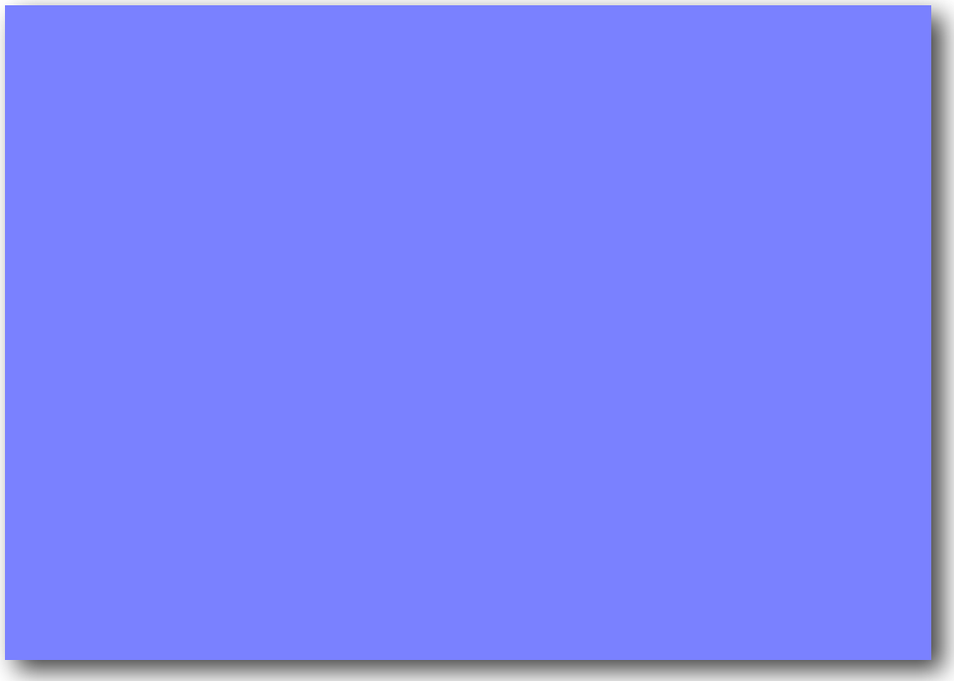
- Legionnaires' disease (air conditioning)
- Local wind effects
- Reuse of existing site
- Indoor effects
- Legionnaires' disease (water supplies)
- Lighting
- Hazardous materials
- Indoor air quality



This was developed through the 1990s and 2000s adding schemes for different building types, such as retail and residential. Today we have BREEAM New Construction 2011, which now has 407 pages and which can be used to assess almost any building.

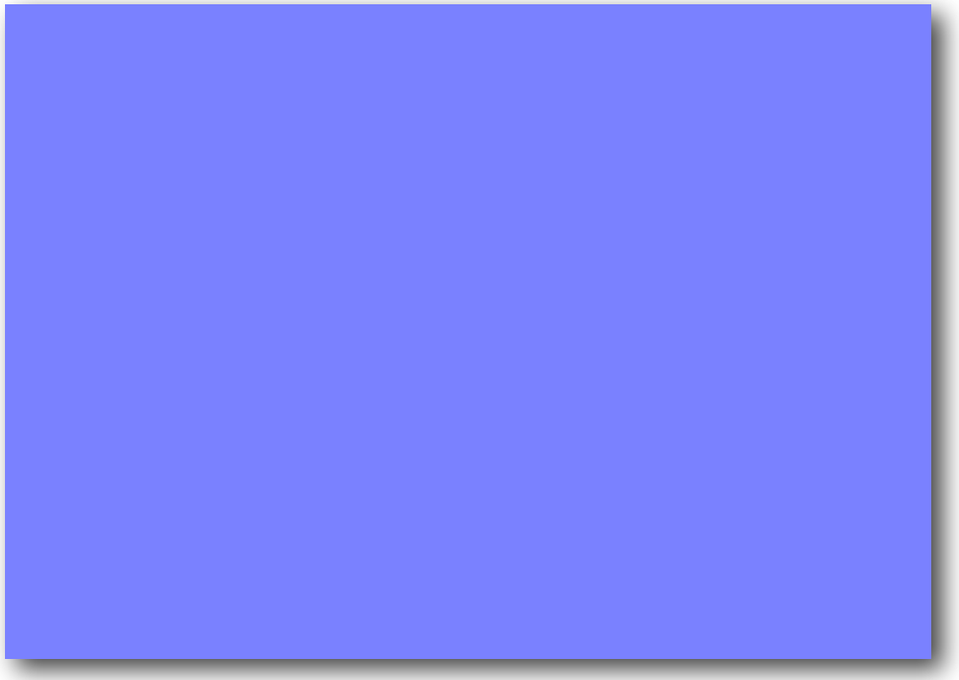
The categories have changed too, with the number increased to nine plus credits are now available for innovation:

- Management
- Health and Wellbeing
- Energy
- Transport
- Water
- Materials
- Waste
- Land Use and Ecology
- Pollution



BREEAM assesses the sustainable performance of buildings across the following areas:

Management: overall management policy, commissioning site management and procedural issues
Energy use: operational energy and carbon dioxide issues
Health and well-being
Pollution: air and water pollution issues
Transport: transport-related CO2 and location-related factors
Land use: greenfield and brownfield sites
Ecology: ecological value conservation and enhancement of the site
Materials: environmental implication of building materials
Water: consumption and water efficiency



BREEAM category	Weighting	No. of sub-categories
1. Health & Wellbeing	15%	Six
2. Management	12%	five
3. Transport	8%	Five
4. water	6%	Four
5. Energy	19%	Nine
6. Pollution	10%	Five
7. Waste	7.5%	Four
8. Land use & Ecology	10%	Five
9. Materials	12.5%	Five
Total	**100%**	
Innovation	10%	None

% contribution to overall BREEAM rating

1. Visual comfort → Scores up to 2.8% (daylighting, glare, view etc)
2. Safety & security
3. Thermal comfort → Scores up to 1.9% (thermal modelling of design)
4. Water quality
5. Acoustics performance → Scores up to 1.9% (meets acoustic standards)
6. Indoor air quality → Scores up to 5.6% (0.95% for nat. vent. capability)

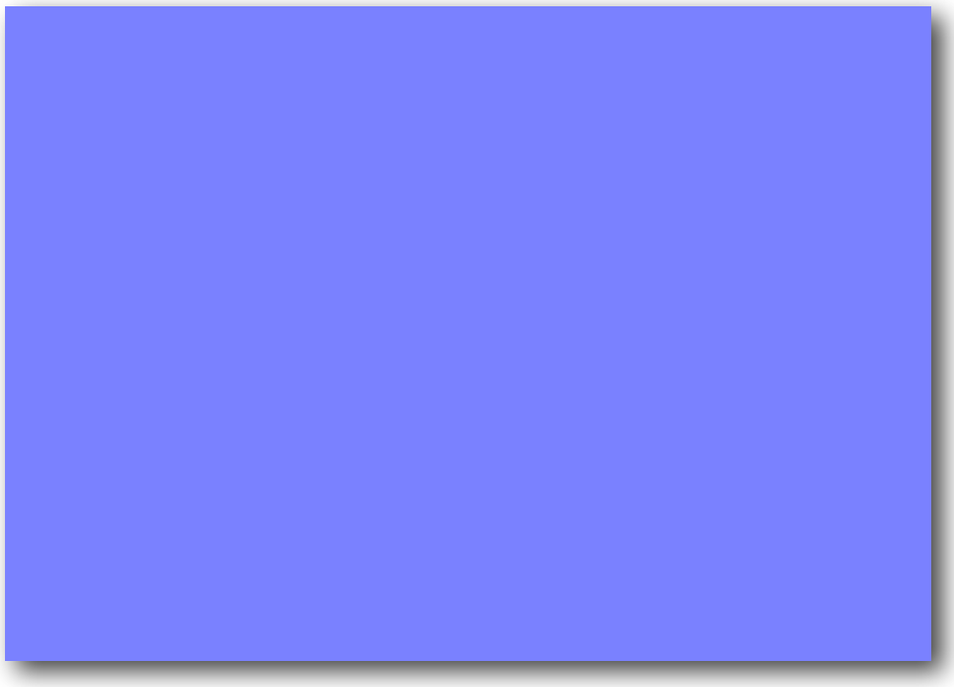
1. Reduced CO_2 emissions → Scores up to 8.1%
2. Energy monitoring
3. Efficient external lighting
4. Low/zero carbon tech. → Scores up to 2.7% (0.54% for night-time cooling)
5. Efficient cold storage
6. Efficient transport systems
7. Efficient laboratory systems
8. Efficient equipment (process)
9. Drying space

1. Life cycle impacts → Scores up to 4.8% (based on Green Guide rating)
2. Hard landscaping
3. Responsible sourcing → Scores up to 2.9%
4. Insulation
5. Designing for robustness

Building Types

The standard covers these main building types.

- Retail
- Offices
- Education
- Prisons
- Courts
- Healthcare
- Industrial
- Specialised buildings assessed under the BREEAM Bespoke method
- Multi-Residential



There are now 49 credit issues assessed from Man 01 – Sustainable Procurement through to Inn 01 – innovation. Each category is weighted (see Figure 2) and then added together to reach the final percentage score.

The 2008 version of BREEAM was a key milestone in the development of the system, and many of the buildings analysed in this report were assessed using this version. This version introduced mandatory post- construction stage assessments for the award of the final certificate, together with minimum standards, innovation credits and the Outstanding rating.

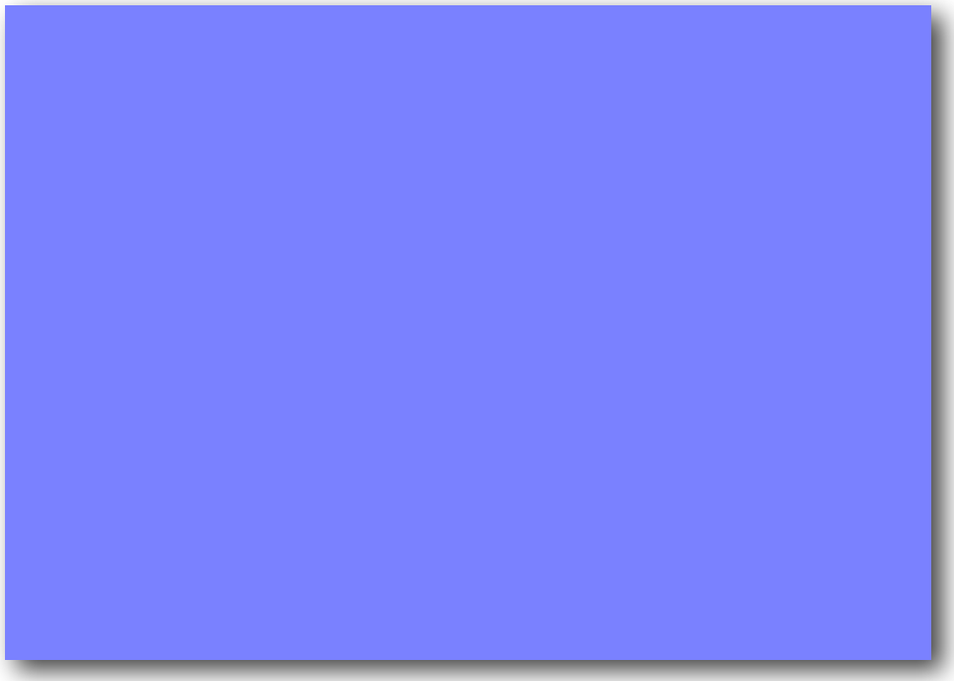
BREEAM offers a number of ratings based on the overall score ranging from Pass to Outstanding. The score thresholds are:

≥ 30% Pass
≥ 45% Good
≥ 55% Very Good
≥ 70% Excellent
≥ 85% Outstanding

Aims

The aims of BREEAM, as given in the 2011 version of the manual are:

- 1. To mitigate the life cycle impacts of buildings on the environment
- 2. To enable buildings to be recognised according to their environmental benefits
- 3. To provide a credible environmental label for buildings
- 4. To stimulate demand for sustainable buildings.



Objectives

Objectives of BREEAM

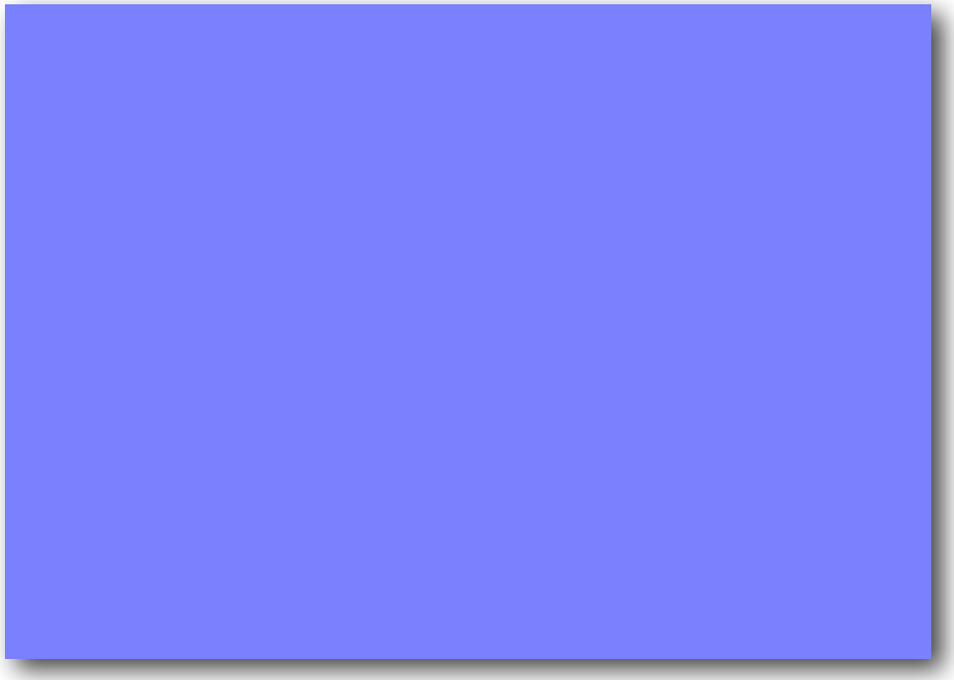
The objectives of BREEAM, as given in the 2011 version of the manual are:

- 1. To provide market recognition of buildings with a low environmental impact
- 2. To ensure best environmental practice is incorporated in building planning, design, construction and operation
- 3. To define a robust, cost-effective performance standard surpassing that required by regulations
- 4. To challenge the market to provide innovative, cost effective solutions that minimise the environmental impact of buildings
- 5. To raise the awareness amongst owners, occupants, designers and operators of the benefits of buildings with a reduced life cycle impact on the environment
- 6. To allow organisations to demonstrate progress towards corporate environmental

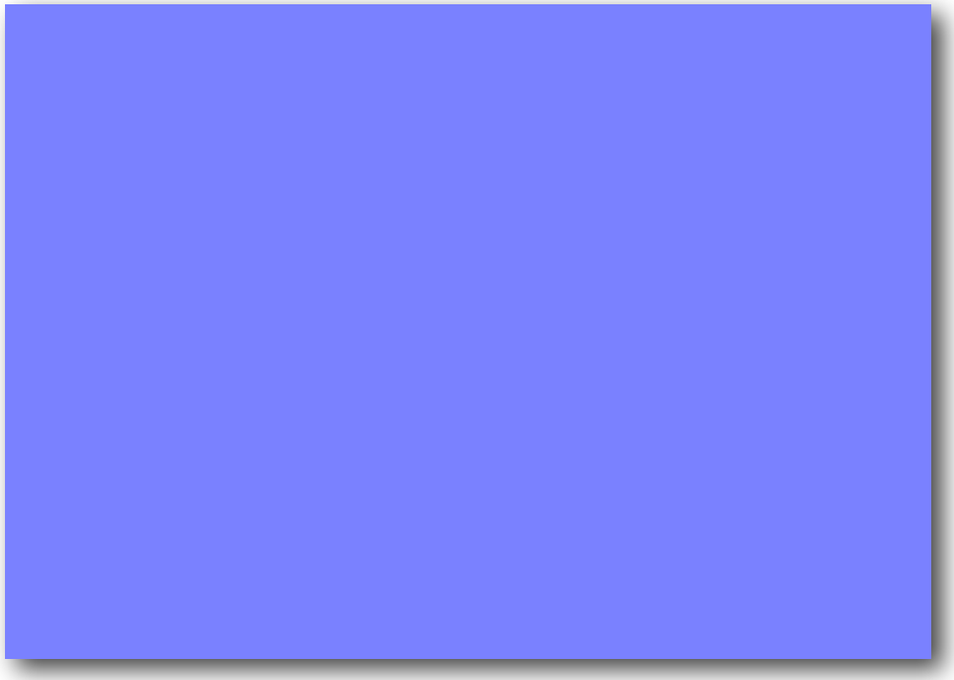
Principles

BREEAM has been developed to meet the following underlying principles:

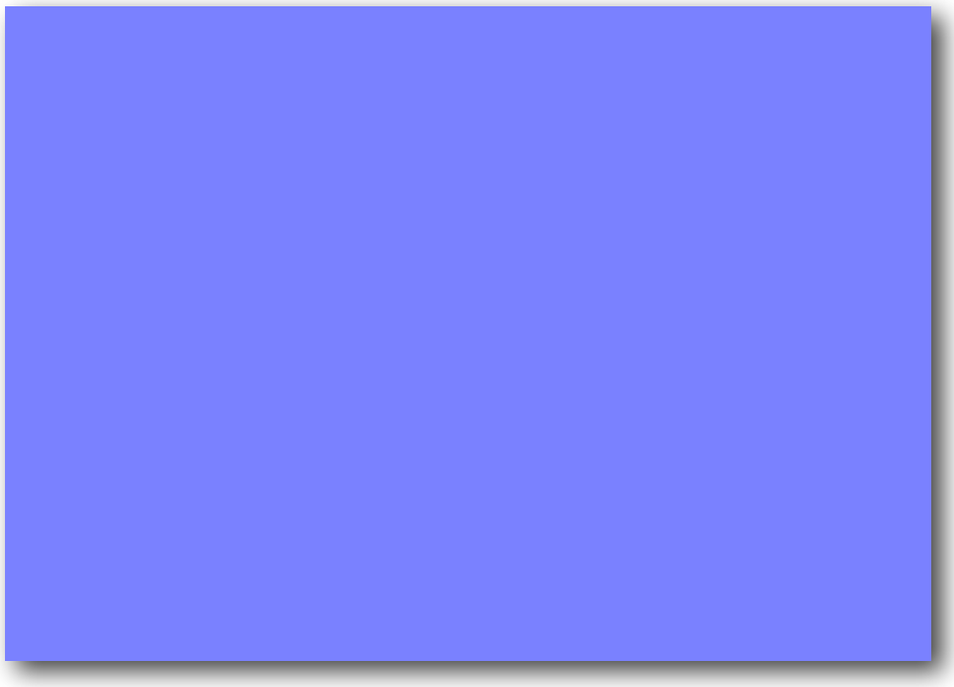
- 1. Ensure environmental quality through an accessible, holistic and balanced measure of environmental impacts
- 2. Use quantified measures for determining environmental quality
- 3. Adopt a flexible approach, avoiding prescriptive specification and design solutions
- 4. Use best available science and best practice as the basis for quantifying and calibrating a cost effective performance standard for defining environmental quality
- 5. Reflect the social and economic benefits of meeting the environmental objectives covered
- 6. Provide a common framework of assessment that is tailored to meet the 'local' context including regulation, climate and sector
- 7. Integrate construction professionals in the development and operational processes to ensure wide understanding and accessibility
- 8. Adopt third party certification to ensure independence, credibility and consistency of the label
- 9. Adopt existing industry tools, practices and other standards wherever possible to support developments in policy and technology, build on existing skills and understanding and minimise costs
- 10. Stakeholder consultation to inform on-going development in accordance with the underlying principles and the pace of change in performance standards (accounting for policy, regulation and market capability).



There are two qualified professionals specific to the BREEAM system. The first is the BREEAM Assessor. They hold licenses to carry out the assessment of different building types. Licenses can be held for the following building types:
Offices
Retail
Industrial
Education
Higher Education
Multi-residential
Healthcare
Other Buildings – Courts
Other Buildings – Prisons
Other Buildings – Bespoke (for non-standard buildings)
Data Centres
International.



- BREEAM Accredited Professionals or BREEAM APs are construction industry professionals who have knowledge of both BREEAM and wider sustainability issues. They are tested and qualified through BRE, and meant to act in a sustainability/BREEAM advisor role on BREEAM projects. Additional credits are available if a BREEAM AP is appointed early in the process and have input into the design and construction.
- There are also national BREEAM schemes in operation in the Netherlands and Spain, and there will shortly be schemes in Sweden and Norway.



The current situation

BRE now publish a list of all BREEAM Assessors, Accredited Professionals and certified buildings (using the 2008 scheme or newer) on their Greenbooklive website.

BREEAM is a significant activity:

- There are 400 BREEAM Accredited Professionals, a UK only qualification, and 1813 licensed assessors from 799 organisations, both in the UK and internationally. This excludes organisations that are only licensed for the domestic schemes and BREEAM in use auditors.
- 802 interim (Design Stage) certificates and 261 final certificates have been issued under the 2008 version of BREEAM across all building types. (See Figure 44)
- In terms of assessment licenses, BREEAM International is the most popular, followed by BREEAM Offices when looking at the UK. Offices also top the number of certificates issued, with Bespoke and Education following.

Glossary

Glossary of terms used in the BREEAM certified building search

Building/Development

This is the name of the building that has been assessed and certified using BREEAM. Note: BREEAM certifies building assessments; some developments may have multiple buildings which may or may not have been individually assessed and certified using one or more BREEAM Schemes.

Client/Developer

This is the client, developer, occupier or owner on the building. Please note this can vary significantly across the various BREEAM schemes and buildings assessed under BREEAM New Construction are oftern registered and certified before eventual occupiers or owners are known. Therefore you may see a few gaps in information in this column - we do our best to maintain this but it is not always exactly accurate. Ownership and occupation of buildings can also often change without our knowledge.

Scheme

BREEAM is a BRE Global Environmental and Sustainability assessment standard for buildings; there are several individual Schemes for assessing the impacts of buildings at key stages of their life cycle (development planning, new build, in use, refurbishment etc). The Schemes are tailored to specific building types such as offices, retail, healthcare etc. For a full description of BREEAM Schemes, follow the link to the BREEAM website to the right hand side of this page.

Glossary

Rating

Any building assessed against the BREEAM standard by a licensed BREEAM Assessor and certified by BRE Global receives a rating. This rating confirms the buildings performance against that standard. BREEAM Ratings range from Unclassified to Pass, Good, Very Good, Excellent and Outstanding. A BREEAM Outstanding rating is the highest achievable rating and represents exemplary specification and design (Design Stage Assessment - interim certificate) and 'as built' construction (Post Construction Assessment - final certificate) - see 'Stage' below.

Stage

BREEAM uses a two-stage assessment and certification process. New buildings can have their BREEAM performance rated based on a design stage assessment (interim certificate) and post construction, or 'as built' assessment (final certificate). The Final BREEAM certificate is the most important as it reflects the assessed performance of the actual built asset.

Certificate Number

A unique reference number that identifies the BREEAM certificate to an assessed building/development.

Assessor

The name of the independent qualified and registered BREEAM Assessor responsible for completing the assessment of the name building.

National Scheme Operator (NSO)

Julian Treasure

Why architects need to use their ears

Example

Sustainable Office Building

http://www.morganlovell.co.uk/useful-info/checklists/sustainability-checklist/

Before work Begins

Be clear about your vision

Get your Board or key stakeholders to buy into the benefits

Decide what level of sustainability you want to achieve

- High
- Medium
- Average

Decide what **BREEAM*** rating you want to achieve

- Outstanding
- Excellent
- Very Good
- Good
- Pass

Decide what **LEED*** rating you want to achieve

- Platinum
- Gold
- Silver
- Certified

Define your project objectives

- Increase energy efficiency to reduce ongoing costs
- Reduce carbon emissions
- Comply with **CRC Energy Efficiency Scheme***reporting requirements
- Comply with (or exceed) building regulations (Part L, Part F)
- Comply with (or exceed) CIBSE and BSRIA Guidelines
- Make better use of your space
- Boost productivity
- Create a healthier workplace (reduce **VOCs***, improve air quality)
- Create or enhance your Corporate Social Responsibility programme
- Communicate a sustainable ethos to staff, stakeholders and clients

Assess and compare your potential building for energy efficiency

Measure the CO2 and CO emissions of the assessed building / office space

What is the difference in CO2 emissions (by percentage) between your site, and a notional building that complies with 2002 building regulations?

Request a copy of the Energy Performance Certificate (EPC) and the associated building report

Choose a building that is already BREEAM (or LEED) rated

Measure the building's solar gain to assess the impact it will have on energy use

Check the compass direction of the space. Is it north or south? Assess how you can use daylight to reduce your lighting demand

What is the energy rating of the heating, ventilation and air-conditioning systems? Will they need to be replaced?

Does the space have a building management system, to enable the monitoring and control of energy use?

Is there sufficient sub-metering in place to measure and report energy use?

Are there enough public transport links to satisfy BREEAM standards?

Is there space for installation of bicycle racks and showers, to meet BREEAM standards?

Drawing up the designs and souring materials

Build sustainability into the design

Design flexible floor plans, that can be rearranged and reconfigured easily in the future, and reduce churn costs

Include convenient recycling points in the design

Incorporate locally manufactured materials, to cut down on the energy and carbon emissions it takes to transport them

Salvage and reuse as many materials that are already on-site as you can

Make the most of the available natural daylight

- Make sure every desk is no more than 7m from a window
- Aim for 80% of the net lettable office floor area to receive natural light

Include a user-friendly glare control system

Use increased insulation

Choose highly efficient or 'super' windows

Use shading to reduce glare and heat from the sun

Choose a design that uses minimal finishes, paints, wall coverings and plastering

Minimise storage to encourage more electronic archiving

Incorporate signs that encourage your staff to turn off equipment and lights

Choose sustainable office fixtures, fittings and furniture

Are they manufactured from recycled materials?

Are they recyclable at the end of their life?

Opt for low VOC emitting carpets, furniture, cabling, paints and adhesives

Are they made by environmentally responsible manufacturers?

Are they produced locally?

Does your timber come from sustainable forests? Is it **FSC*** certified?

Use rapidly renewable materials wherever you can (like bamboo)

Think about what you can reuse

Consider energy efficiency and carbon reduction

Select high-quality, energy efficient lighting (see next section)

Put reasonable limits on your temperature controls for day-to-day use

Use zoned energy controls, to control low-usage areas separately

Install an automatic shut-off system for equipment on standby

Choose a Building Management System (BMS) to automatically turn off power at night and on weekends

Install smart, energy efficient heating, ventilation and air-conditioning systems

Choose items that qualify for **Enhanced Capital Allowances***

Make sure 10% of the total energy demand comes from local renewable / low emission energy sources

Install wireless sub-metering to monitor, track and reduce energy use across floors / zones

Install 'workplace footprint tracker' software to control and display energy use on dashboards to encourage building occupants to reduce their individual energy use

Install devices to manually shut down workstations when not in use

Install timers on appliances to automatically shut down equipment out-of-hours (televisions, audio-visual, etc.)

Do you qualify for interest-free loans from the Carbon Trust?

Be smart with your lighting

Make sure you meet appropriate maintained luminance levels (in lux), as per building regulations

Use zoned lighting, with separate controls

Choose light fittings with built-in daylight sensors, to make the most of your natural light

Install infrared motion detectors for automatic lighting control

Install timers to shut off lighting on weekends and at night

Fit high efficiency fluorescent lights

Consider LED lighting. A standard 40W incandescent bulb has an expected lifespan of 1,000 hours while an LED can continue to operate with reduced efficiency for more than 50,000 hours - 50 times longer than the incandescent bulb

Use task lighting. Task lighting provides better light for detail work and offers more control to individuals, reducing the need for energy-hungry overhead lighting

Waste less water

Choose low water flow fittings

- Low flush toilets
- Waterless urinals

Use rainwater or grey water systems

Fit a reliable leak detection system

Include proximity detection shut-off to the water supply for all WCs

Install point-of-source, filtered water to reduce the cost, waste and transport of bottled water

Improve air quality

Use more natural ventilation

Monitor and assess your CO2 emissions

Use 'low emitting' materials, without volatile chemicals

- Carpet
- Paints and adhesives
- Composite wood

During the build

Ensure environmental best practice on site

Manage stripped out materials, to divert waste from landfills

- Donate unwanted furniture, computers and appliances to charity
- Recycle plasterboard, carpet and other materials
- Separate waste

Follow the proper procedures to dispose of hazardous materials (with the paper trail to prove it)

Prove you have a proper recycling policy in place

Put a proper Environmental Management System (EMS) in place

Use only FSC certified wood

Fit out made CarbonNeutral

Set targets for energy, carbon and water use on site

After you've moved in

Talk to your people

Get feedback from your staff on your new office

Communicate clearly about your ongoing sustainable goals and objectives

- Design presentations
- Project extranet
- Notice boards and company newsletters
- Training on how to use all the systems (lights, heating and air, etc.)

Make recycling part of everyday life

Set up lots of convenient recycle bins for staff

Have separate recycle bins for paper, electronics, batteries, plastics, etc.

Make the case for a 'paperless' office, encouraging electronic archiving instead

Set clear policies on shutting down computers, copiers and appliances out-of-hours

Make ongoing plans for the future

Educate your staff on environmental issues, to get them personally involved

Re-assess all your systems at the end of the first year

Plan to run an energy audit every year

Put procedures in place for monitoring your energy use

Choosing a sustainable design and fit our contractor

What environmental credentials to they have?

ISO 14001 Certified (evidence provided)

Company Environmental Policy (evidence provided)

Company Environmental Management System - EMS (evidence provided)

BREEAM assessors in-house

LEED accredited professionals in-house

Member of FTSE4Good

Environmental management team in-house (not subcontracted)

Environmental good practice on site

- Do they have a documented system for separating, managing and recycling waste on site?

What services are included, or on offer?

BREEAM assessments
LEED assessments
Building assessments for sustainability
Can they supply FSC certified timber through their supply chain?
Advice on Enhanced Capital Allowances
In-house sustainability / environmental experts
Sourcing and procuring sustainable materials, furniture and fittings
Environmental compliance on site
Project extranet for project communication
Electronic surveys for your staff
CarbonNeutral fit outs

Do they have a track record of sustainable projects?

Do they have case studies that show successful energy reduction?

Glossary

NSO(National Scheme Operator)

National Scheme Operators develop and own country specific local Schemes that are affiliated to BREEAM. BRE Global is the National Scheme Operator for the UK and broader International and European schemes (BREEAM), the Dutch Green Building Council is the National Scheme Operator for the Netherlands (BREEAM NL), the Instituto Tecnológico de Galicia is the National Scheme Operator for Spain (BREEAM ES) and the Norwegian Green Building Council is the National Scheme Operator for Norway (BREEAM NOR).

CRC Energy Efficiency Scheme is a new regulatory regime that is intended to encourage large, non-energy intensive businesses (for example: retail chains, banks, local authorities and many institutional landlords) to improve their energy efficiency and reduce their carbon emissions.

VOCs are volatile organic compounds, emitted by many paints, glues, wirings, carpets and other materials. They can be harmful over time.

The Forest Stewardship Council **(FSC)** promotes environmentally appropriate, socially beneficial, and economically viable management of the world's forests.

Enhanced Capital Allowances are a Government incentive, to encourage you to choose energy efficient heating, ventilation and air-conditioning equipment. You can claim back money for certain kinds of equipment.