

An Insight Into BREEAM 2011



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Part of the BRE Trust

Summary



- Drivers for change

- Structural changes
 - Scope
 - Presentational

- Technical changes
 - New additions
 - Changes to existing issues

- User benefits
 - Client / specifier
 - Assessor

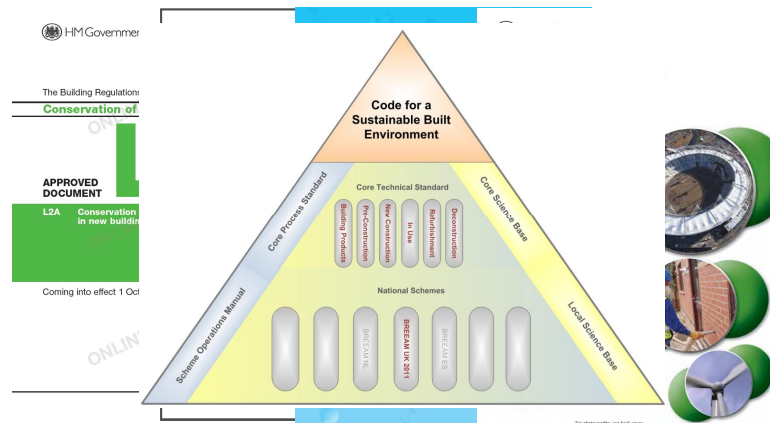
Drivers & Influences



- New regulation & standards
- Industry/user feedback
- Continual improvement



New and up-coming regulation and standards



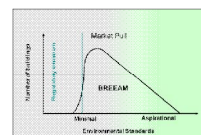
Market/Industry feedback

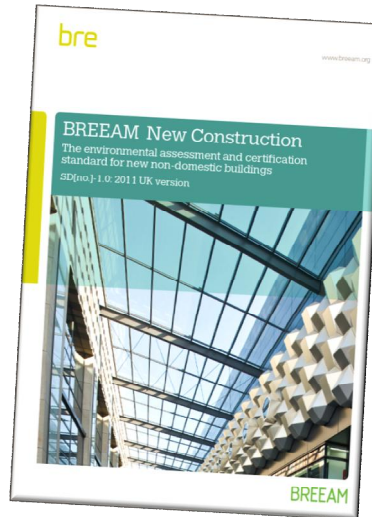
- 257 respondents to survey (assessors, architects, engineers and contractors)
- UK GBC members consultation workshop on BREEAM
- Expertise:
 - Waste and resources
 - Life Cycle Costing experts
 - Acousticians
 - Energy modellers
 - Social scientists
 - Life Cycle Assessment experts
 - Ecologists
 - BREEAM Assessors
 - Accessibility Consultants
 - Lifts consultants
 - Clients
 - Trade Associations



Continual improvement

- Market focused, science led:
 - Driver for low cost, low carbon sustainable buildings
 - Improved standards for new buildings
 - Reflecting and industry leading
 - Embracing new technology and processes
 - More efficient, cost-effective delivery and compliance





Scope of BREEAM 2011



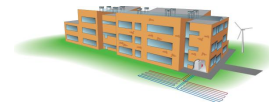
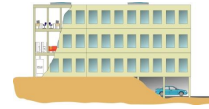
- Consolidation: One 'assessment manual'
- 49 assessment issues, across 9 environmental sections
- Scheme defines and measures 'core' issues and impacts (links to the CSBE)
- Criteria still accounts for;
 - building type, occupancy and usage differences
 - standards, opportunities and niches

ENERGY	WATER
Reduction of CO ₂ emissions	Water consumption
Energy monitoring	Water monitoring
Energy efficient external lighting	Water leak detection and prevention
Low or zero carbon technologies	Water efficient equipment (process)
Energy efficient cold storage	WASTE
Energy efficient transportation systems	Construction waste management
Energy efficient laboratory systems	Recycled aggregates
Energy efficient equipment (process)	Operational waste
Drying space	Speculative floor and ceiling finishes
TRANSPORT	MATERIALS
Public Transport Accessibility	Life Cycle Impacts
Proximity to amenities	Hard landscaping and boundary protection
Cyclist facilities	Responsible sourcing of materials
Maximum car parking capacity	Insulation
Travel Plan	Designing for Robustness
LAND USE & ECOLOGY	POLLUTION
Site selection	Impact of Refrigerants
Ecological value of site/Protection of ecological features	NO _x emissions from heating/cooling source
Mitigating ecological impact	Surface Water Run-Off
Enhancing site ecology	Reduction of night time light pollution
Long term impact on biodiversity	Noise attenuation
HEALTH & WELLBEING	MANAGEMENT
Visual comfort	Sustainable Procurement
Indoor air quality	Responsible Construction Practices
Thermal Comfort	Construction site impacts
Water Quality	Stakeholder Participation
Acoustic performance	Service Life Planning and Costing
Safety and Security	

Scope of BREEAM 2011: building types



Sector	Building type
Commercial	Offices Industrial Retail
Public (non housing)	Education Healthcare Prisons Law courts
Multi-residential accommodation	Sheltered accommodation Halls of residence Residential care homes Military barrack Local Authority secure accommodation
Assembly and Leisure	Cinema Theatre/music/concert hall Exhibition/conference hall Indoor or outdoor sports/fitness and recreation
Other non residential	Art gallery, Museum Library Day centre, hall/civic/community centre Place of worship
Other residential	Hotel, Hostel, Boarding and guest house Secure training centre Residential training centre



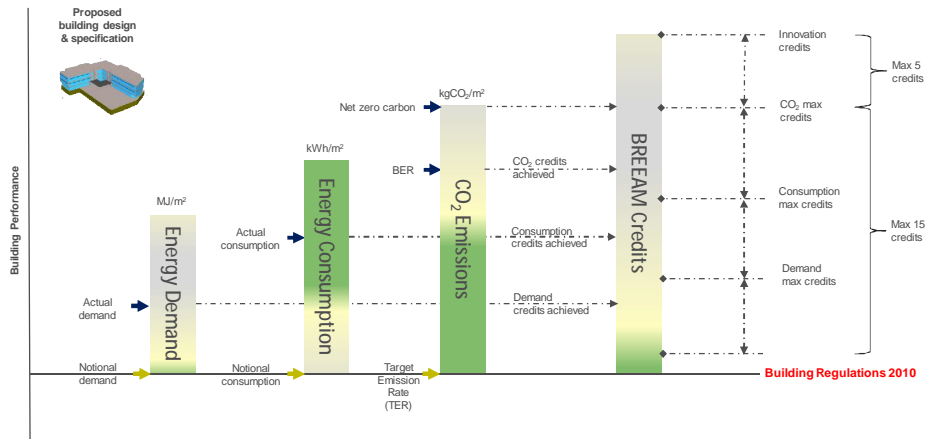
Technical changes and additions



- Energy & reduction of CO₂ emissions
- Water consumption
- Low or zero carbon technologies
- Life cycle impacts (building elements/materials)
- Sustainable procurement
- Stakeholder participation
- Recycled aggregates
- Minimum standards
- Other changes to look out for



Energy efficiency and CO₂ emissions (Ene 01)

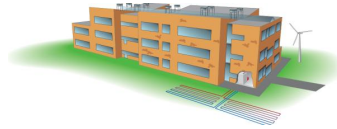


Translating performance



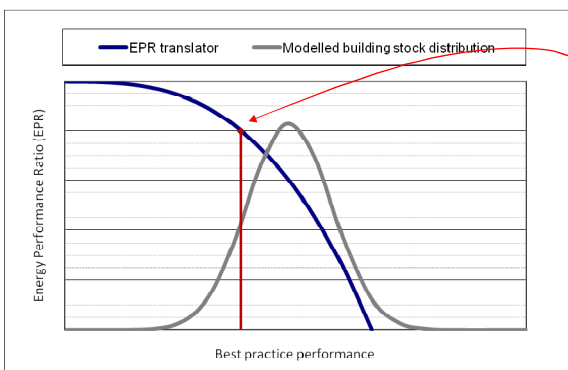
- Performance expressed as a ratio (EPR_{NC}) = BREEAM credits
- BREEAM Performance $EPR_{NC\ Total} = EPR_{NC\ Demand} + EPR_{NC\ Consumption} + EPR_{NC\ CO_2}$
- 3 steps to determining EPR_{NC}
 - Step 1: Calculate actual performance as a proportion of notional/TER
 - Step 2: “Translated” in to EPR_{NC}
 - Step 3: Demand/consumption/CO₂ weighting applied

Step 1: actual performance relative to notional



Building	Demand (MJ/m ²)			Consumption (kWh/m ²)			CO ₂ (kgCO ₂ /m ² /yr)		
	Notional	Actual	% A/N	Notional	Actual	% A/N	TER	BER	% A/N
School A	145	109	75%	135	105	78%	33	26	79%

Step 2 and 3: Translating performance



Example translation for energy demand:

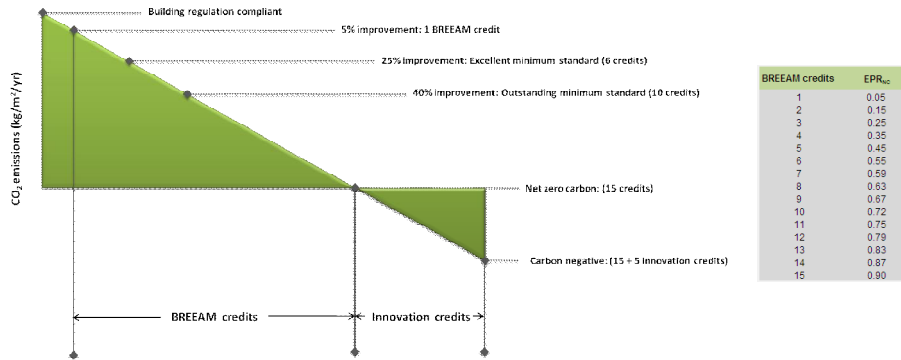
- 25% improvement = best practice
- Best practice = 80% of the points (EPR ratio)
- EPR of 0.80 (un-weighted)
- Demand weighting = 0.28
- Weighted Demand **EPR = 0.22**
- Best practice building = EPR of 0.72
- 10 credits (subject to minimum CO₂ performance being met)

Best practice building		
Performance Indicator	Best practice improvement	Proportion of overall EPR _{bc} achieved
Energy demand	25%	80%
Energy consumption	27%	80%
CO ₂ emissions	27%	60%

Performance Indicator	Weighting
Energy demand	0.28
Energy consumption	0.34
CO ₂ emissions	0.38

BREEAM credits	EPR _{bc}
1	0.05
2	0.15
3	0.25
4	0.35
5	0.45
6	0.55
7	0.60
8	0.63
9	0.67
10	0.72
11	0.75
12	0.79
13	0.83
14	0.87
15	0.90

Calibrating performance



Water consumption (Wat 01)



- Expanded water consumption methodology
 - More building types covered
 - Updated occupancy usage data (activity database)
 - Baseline and five performance levels/standards defined
 - Accounts for greywater (BS8525) and rainwater harvesting systems (BS8515)
- Water consumption calculated and reported
 - litres/person/day
 - m³/person/yr
- Minimum standards maintained
 - Good, V Good, Excellent = 1 credit
 - Outstanding = 2 credits

% improvement on notional baseline	No. of BREEAM credits
12.5%	1
25%	2
40%	3
50%	4
55%	5
65%	Exemplary performance

Component	Baseline	units
WC	6	litres
Wash hand basin taps	12	litres/min
Showers	14	litres/min
Baths	200	litres
Urinal (2 or more urinals)	7.5	litres/bowl/hr
Urinal (1 urinal only)	10	litres/bowl/hr
Greywater/rainwater system	0%	% flushing demand met by recycled
Kitchen tap: kitchenette	12	litres/min
Kitchen taps: restaurant	10.3	litres/min
Domestic sized dishwashers	17	litres/cycle
Domestic sized washing machines	90	litres/use
Waste disposal unit	17	litres/min
Commercial sized dishwashers	8	litres/rack
Commercial sized washing machines	14	litres/kg

Low and zero carbon technology (Ene 04)



- Benchmarks increased (for upper levels)
- Additional BREEAM 'credit'
- Life cycle carbon impact of technology addressed
 - % reduction in regulated (operational) CO₂ emissions
 - % reduction in embodied and operational CO₂ emissions

No of credits	% reduction in operational CO ₂	No of credits	% reduction in life cycle CO ₂ emissions
1	Feasibility study	2	Feasibility study
2	10%	3	10%
3	20%	4	20%
4 (Exemplary credit)	30%	5 (Exemplary credit)	30%

Life cycle impacts (Mat 01)



- Use of specific Environmental Product Declaration (EPD) data for an element or part element
- Can be used to calculate a bespoke Green Guide rating
- Accounts for the EPD methodology/type used to verify life cycle impact data
- Reporting of life cycle CO₂ emissions (kgCO₂):
 - Data available via Green Guide online
 - Total by element and for building



Sustainable procurement (Man 01)



- New approach; embodying and consolidating existing BREEAM 2008 elements

- Aligns with the principles of the 'soft landings' framework

- Project brief and design (4 credits)
 - Defining main stakeholders roles and responsibilities
 - End user reqs > design strategy > handover and occupation
 - Use of BREEAM Accredited Professional (at key stages)
 - Facilitation, monitoring and reporting progress
 - BREEAM performance targets contractually set and agreed

- Construction and handover (2 credits)
 - Targeting construction defects (thermographic survey)
 - Building services commissioning (as existing criteria)

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Sustainable procurement (Man 01)



- 'Aftercare' (2 credits) - Aim: deliver a functional, sustainable asset in accordance with expectations

- Assessment criteria
 - First 12 months after handover
 - Seasonal commissioning (as existing)
 - Mechanism for building data collection, comparability and analysis
 - Provision of 'aftercare' support to building occupants
 - Aftercare team/individual
 - Building user guides
 - FM support

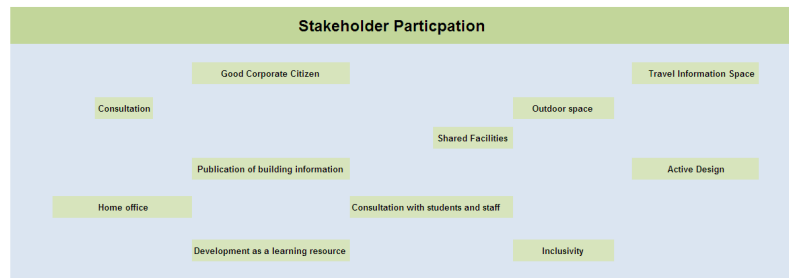
- Exemplary level of performance
 - First three years of occupation
 - FM collection of occupant satisfaction, energy and water data
 - Check performance, set targets
 - Provision of data to BRE Global
 - BREEAM In Use scheme

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Stakeholder participation (Man 04)



- Consolidates a number of existing BREEAM issues and criteria



- Less prescriptive approach, but allows for complexity of building/users e.g. industrial unit vs. school or hospital
- Aim: To design, plan and deliver accessible, functional and inclusive buildings in consultation with current and future building users and other stakeholders

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Stakeholder participation (Man 04)



- Consultation
 - Consultation plan
 - Relevant parties and bodies identified and consulted
- Inclusive and accessible buildings
 - Access statement
 - Provision of facilities for building users (shared with public/community users where appropriate)
- Building user information
 - Building User Guide (as existing)
 - Building/site related information e.g. travel information, amenities
- Post-Occupancy Evaluation (POE) commitment
 - Independent, one year after occupation
 - Measure, review, feedback and....
 - Share good practice i.e. dissemination of POE outcomes to wide audience

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Recycled aggregates (Wst 02)



- Benchmark: 25% of the high-grade aggregate is recycled or secondary aggregate (as BREEAM 2008)
- To contribute to the total amount, the % of high-grade aggregate specified per application must meet minimum levels:

Application	Min % recycled / secondary aggregate	
	One Credit	Exemplary level
Structural frame	25%	50%
Floor slabs including ground floor slabs	25%	50%
Bitumen or hydraulically bound base, binder, and surface courses for paved areas and roads	50%	75%
Concrete road surfaces	25%	50%
Pipe bedding	50%	100%
Building foundations	25%	50%
Granular Fill and Capping	75%	100%
Gravel landscaping	100%	100%



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Technical changes: ones to look for....



- Construction waste management: updated benchmarks
- Impact of refrigerants: updated criteria
- Surface water run-off: aligns with CSH
- Responsible sourcing: review of schemes/tiers, hard landscaping element added, minimum req. for timber spec projects
- Ecological value of site: New checklist and data
- Thermal comfort: New criteria and reporting requirements
- Indoor air quality: additional credit, criteria and reporting requirements
- Water quality: new issue, includes existing criteria
- Transport: 'rural location sensitive buildings'
- Service life planning and costing: re-defined criteria
- Construction site impacts: re-defined criteria
- New exemplary levels of performance: Energy, responsible sourcing, water consumption, sustainable procurement, LZC, construction waste



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Minimum standards



BREEAM issue	PASS	GOOD	VERGY GOOD	EXCELLENT	OUTSTANDING
Man01: Sustainable procurement	One credit	One credit	One credit	One credit	Two credits
Man02: Responsible construction practices	-	-	-	One credit	Two credits
Man04: Stakeholder participation	-	-	-	One credit (Building User Guide)	One credit (Building User Guide)
Hea01: Visual comfort	Criterion 1 only	Criterion 1 only	Criterion 1 only	Criterion 1 only	Criterion 1 only
Hea04: Water quality	Criterion 1 only	Criterion 1 only	Criterion 1 only	Criterion 1 only	Criterion 1 only
Ene01: Reduction of CO ₂ emissions	-	-	-	Six credits	Ten credits
Ene02: Energy monitoring	-	-	One credit (sub-metering)	One credit (sub-metering)	One credit (sub-metering)
Ene04: Low or zero carbon technologies	-	-	-	One credit	One credit
Wat01: Water consumption	-	One credit	One credit	One credit	Two credits
Wat02: Water monitoring	-	Criterion 1 only	Criterion 1 only	Criterion 1 only	Criterion 1 only
Mat03: Responsible Sourcing	Criterion 3 only	Criterion 3 only	Criterion 3 only	Criterion 3 only	Criterion 3 only
Wat01: Construction waste management	-	-	-	-	One credit
Wat03: Operational waste	-	-	-	One credit	One credit
LE03: Mitigating ecological impact	-	-	One credit	One credit	One credit

BREEAM 2011: benefits



1. An updated, world leading environmental performance standard for new buildings
2. Maintains a robust yet flexible and low-cost approach to setting, measuring and monitoring building performance targets
3. Aligns with and complements existing, new and emerging standards and practices
4. Provides a structure that encourages and supports the defining and delivery of zero carbon buildings
5. Can facilitate delivery of 'whole-life' building benefits at the design and construction stage for no additional cost
6. Provides a barometer of building performance against industry average/standard practice
7. Source of key performance indicators (energy, water, waste etc.) for comparability
8. In short, BREEAM 2011 'adds value' to new buildings



Further information



- BREEAM 2011 publication: Mid-March 2011
- BREEAM 2011 goes live: Summer 2011
- www.breeam.org/2011 (includes FAQs)
- Visit us at Ecobuild (stand S1330)
- BREEAM certified buildings: www.greenbooklive.com



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