



European Property Sustainability Matters

- retro fitting buildings and places

 **King Sturge**

2010

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Executive summary

This is the sixth annual report by King Sturge entitled "European Property Sustainability Matters". It addresses some of the current issues and ideas which are emerging under the banner of "sustainability".

- **Sustainability strategy:** the use of buildings needs to be appropriately managed if the carbon footprint is to be lowered. There needs to be a co-ordinated approach making the best use of the building and its technologies to obtain the best value.
- **Retro-fitting buildings:** how do we make better use of existing building to make them more efficient for occupiers AND more environmentally friendly? (See page 7)
- **Retro-fitting places:** re-using our towns and cities is the major challenge for the next decade. The easy days of ever rising capital values and plenty of debt to finance new build are no longer with us.

Energy and legal requirements

- So far there is very little evidence that **Energy Performance Certificates** have significantly reduced the carbon footprints of buildings. (See page 35)
- **Display Energy Certificates** (See page 36) - and the future **Carbon Reduction Commitment** in the UK- (See page 30) offer the opportunity to accelerate the reduction in the carbon footprint of building.
- **The EU aims to make all new buildings zero energy by 2019.** (See page 30)
- DECs will be displayed on all buildings larger than 250 m² (not the current 1,000 m²) that are occupied by public authorities.
- EPCs will be displayed on commercial buildings larger than 250 m² (not the currently 1,000 m²) that are frequently visited by the public or where such certificates have been produced on sale, rent or construction (or major renovation) of a building.
- There are concerns that implementing the current directive is very challenging. Others are worried

about the administrative burden of the next directive. A further reading of the next Energy Performance of Buildings Directive between the EU Energy Council and Parliament is expected to take place during 2010.

Retro-fitting buildings

- So called "green" energy is not sufficient. Even if every hill had a wind turbine, every tidal estuary had a power station and we maximise the use of solar panels and photovoltaic cells, research suggests we still could not meet our current energy needs. It might be able to be 10% of our needs by such means. (See page 4) **Saving energy has a far better payback than trying to generate "green" energy.**
- Making better use of existing buildings (and saving the embodied energy) could save more than 20% of current energy consumed. Making buildings more energy efficient could save another 20% - a total saving of 40%
- Analysis by King Sturge suggests the main cost and energy benefits from retro-fitting an office building may come from the better space planning. (See page 10)
- The **greater enjoyment and productivity** from management change, which is frequently associated with office refurbishment, maybe far more important than simply saving energy-in-use.
- There is almost **no evidence that occupiers and investors pay more for a "green building"**. However, **higher-rented prime investments** (such as offices in Central London) **will suffer far less asset "green" depreciation.**
- Prime investments (producing a real return of 5%) where rents are relatively low will suffer far more investment "green" depreciation than secondary investments. (See page 11)
- Rising social sustainable costs will have a far larger negative impact than the adverse impact of rising economic or environmental sustainable costs. (See page 12)
- An adverse yield shift (reducing the capital value at the end of the investment in 25

years) will cause far more asset depreciation for “non-green” lower-rented prime and secondary investments than for higher-rented property.

- **The best way to make a building “green” is not to use energy** by better space planning and reducing energy demand through occupier use, plus more efficient plant and fabric design. Generating “green” energy may produce a very low or even negative carbon payback.

Retro-fitting places

- Cities need to accommodate more bicycles. Cycling is far more energy/speed efficient than public transport, electric cars and modern cars with two or more passengers, which are even more efficient than hybrid fuel-oil cars. (See page 4)
- There are an increasing number of sustainable “footprint” tools – most of which just focus on energy. (See page 18) **The Building Sustainability Assessment Tool** – pioneered by King Sturge six years ago – remains one of the few that accommodates environment, social and economic issues.
- Social sustainability is to do with building better communities and urban areas; buildings and property investment is only a small (but vital) part of that concept, and they all can contribute to saving energy. **More efficient urban areas use less energy.**
- Nationally and internationally there is a variety of funds available to create private public partnerships (PPP) to “pump prime” urban renewal where “gap funding” is needed as a result of the private sector not being sufficient to start such developments.
- The LABV (**Local Asset Backed Vehicle**) pioneered by King Sturge (See page 20) has become very successful in recent years as a PPP finance solution. Via the EU JESSICA initiative (**Joint European Support for Sustainable Investment in City Areas** – (See page 24) it is now available as a vehicle in all 27 EU states.
- The LABV is a limited liability special purpose vehicle (legal entity) agreed between public and

private sector partners with the specific purpose of carrying out comprehensive, area based regeneration and/or renewal of council assets. In essence the public sector invests property assets into the vehicle which are matched in cash by the private sector partner.

- A well structured LABV anticipates the future uplift in market value and asset value created by the urban retro-fitting project.
- JESSICA is an innovative instrument that is being used for the first time in the 2007-13 EU Structural Funds programming period and whose implementation entails a profound cultural shift regarding the way in which assistance is provided. JESSICA is designed to increase the use of financial engineering instruments within the framework of Cohesion Policy, such as Local Asset Backed Vehicles (LABVs).
- Local Incentive Backed Vehicles (see page 22) with an energy option incentive offer a Pan-European investment vehicle to accelerate the reduction of a city’s carbon footprint.
- **Retro-fitting buildings AND places, as part of an overall sustainable strategy, is the main challenge for the European property market over the next 2-5 years.**

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Introduction

This is the sixth annual report by King Sturge entitled "European Property Sustainability Matters". As with the previous reports it addresses some of the current issues and ideas which are emerging under the banner of "sustainability"; one increasingly used, but perhaps one of the most misunderstood words.

An overall sustainability strategy needs to ensure that the sustainability of property and of our urban places can be managed and improved. The focus of this year's report is on:

Retro-fitting buildings: how do we make better use of existing buildings to make them more cost efficient for occupiers AND more environmentally friendly.

Retro-fitting places; re-using our towns and cities is the major challenge for the next decade. The easy days of ever rising capital values and plenty of debt to finance new build are no longer with us. The credit crunch and recession across European countries has temporarily brought the "new build" game to a halt.

The **key drivers** of the sustainable agenda include: the cost and security of energy, EU and national government targets and legislation, consumer pressures, corporate social responsibility agendas and the impact on property portfolios.

The energy imperative

The "**transitions towns**" movement is growing dramatically. It is based on using buildings and places in a low energy era. It suggests we are at (or may have passed) the "peak oil" period in the world's history. Energy will become more expensive.

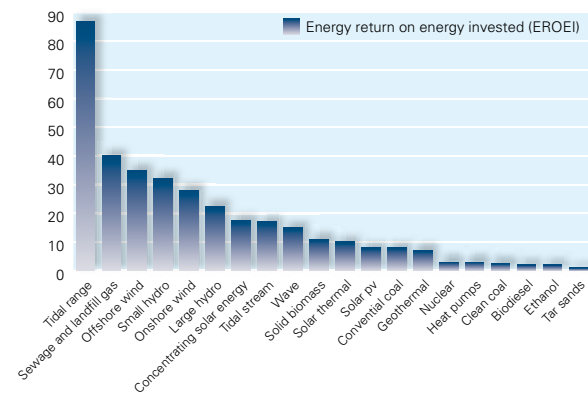
Current European "**transition towns**" with active strategies in place include:

- UK: Ottery St Mary, Bristol, Penrith, Chester, Kingston-upon-Thames, Cambridge, High Wycombe, York, Dunbar, Llandeilo.
- Ireland: Kinsale, Kilkenny.

- Italy: Monteveglio
- Germany: Berlin, Freidrichshain Kreuzberg, Freiburg
- Netherlands: Deventer

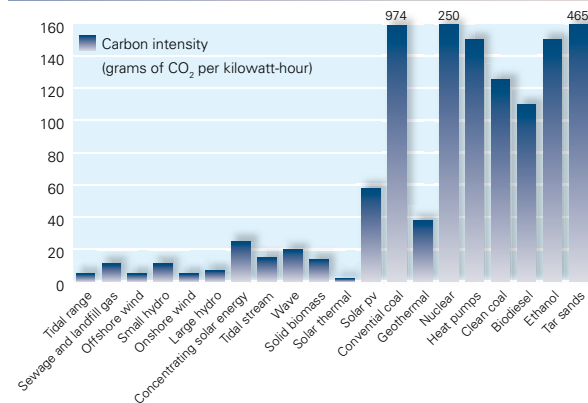
The following table measures both a) the carbon footprint for each energy source and b) the payback in terms of energy expended to energy produce. They reinforce the undesirability of bio-fuels as well as the urgent need for coal (and coal tar) to remain in the ground. Tidal power appears to be very effective.

Energy return on energy invested for the range of energy sources



Source: The Transition Handbook, Rob Hopkins, Green Books Ltd 2008 - The Ecologist Magazine

The carbon footprints for the same energy sources as grams of CO₂ per kilowatt-hour

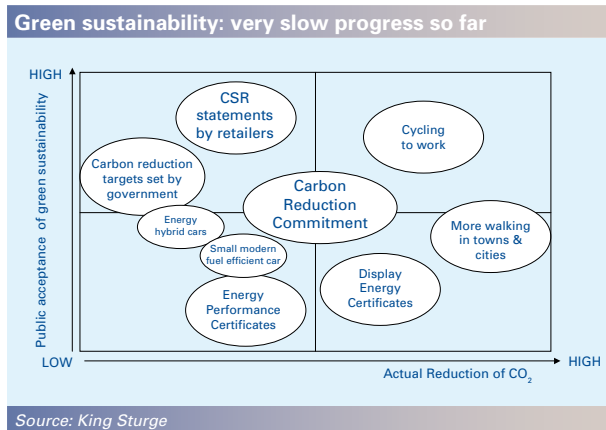


Source: The Transition Handbook, Rob Hopkins, Green Books Ltd 2008 - The Ecologist Magazine

As we discussed in the King Sturge 2008 report, the whole life carbon footprint of a building is important, including transport.

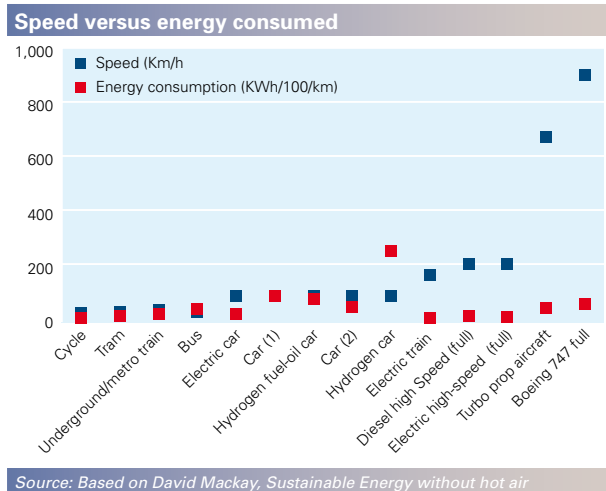
King Sturge: European Property Sustainability Matters

The next diagram shows the anecdotal Public Acceptance of Energy Certificates and some means of transport versus the actual reductions in CO₂. It is generic/indicative only. Cycling to work is far more acceptable and effective than Energy Performance Certificates (EPCs).

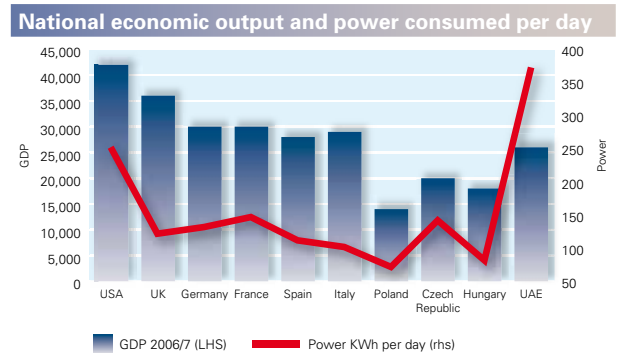


The following charts look at transport “speed” versus “energy consumption”. Cycling is far more energy/speed efficient than public transport, electric cars and modern cars with two or more passengers, which are more efficient than energy cars.

Whilst electric high-speed rail appears efficient, this ignores the large negative carbon footprint of new rail track (and tunnels). In other words, David Mackay’s excellent analysis ignores the carbon footprint of the embodied energy making (and disposing of) the transport system. But it shows that a full jumbo jet is more efficient per mile travelled than most cars.

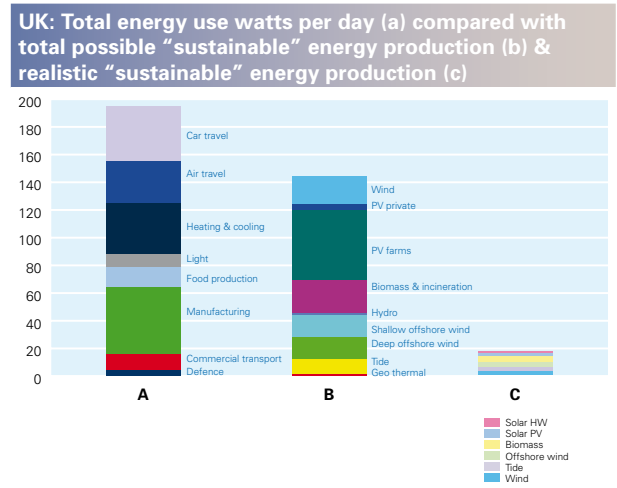


Across Europe the UK is relatively efficient in terms of its GDP (for 2006-07) output versus energy consumed.



Source: Based on David Mackay, Sustainable Energy without hot air

In “Sustainable Energy – without the hot air”, David Mackay suggests that, even if every hill had a wind turbine, every tidal estuary had a power station and we maximise the use of solar panels and photovoltaic cells, we still could not meet our current energy needs with “green” energy. We might be able to meet 10% of our needs by such means.



Source: Based on David Mackay, Sustainable Energy without hot air

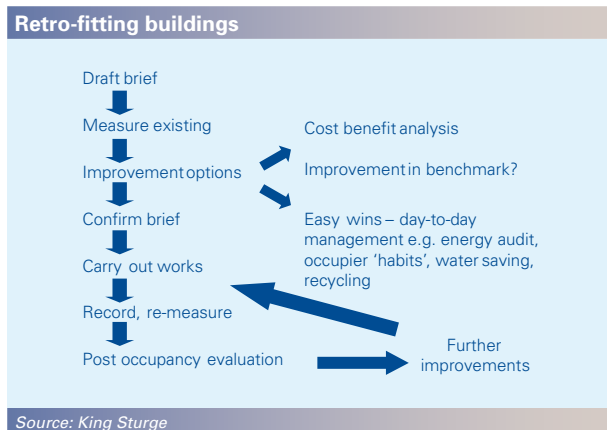
To reduce our carbon footprint (in the UK and across the world) producing “green” energy is NOT the whole solution. Using less energy should be the main focus to lower our global carbon footprint significantly. Using property far more efficiently by putting in place a sustainability strategy and by retro-fitting existing buildings and places is a major route to reducing our carbon footprint.



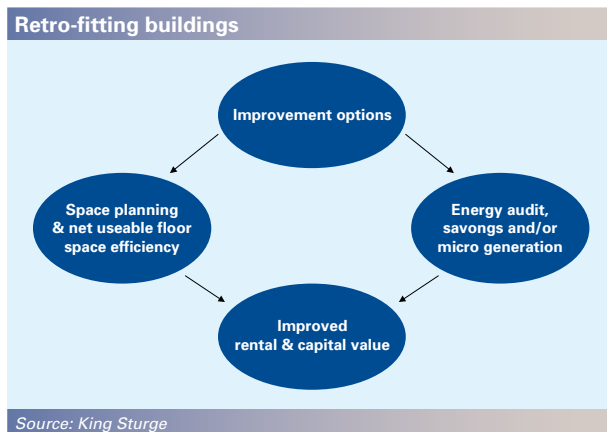
Retro-fitting buildings

Retro-fitting buildings to lower carbon emissions is the challenge we now face

The following sets out a flow diagram of the retro-fitting building process as implemented by King Sturge.



As analysis shows (see page 10) far more energy can be saved by using buildings, energy and space more efficiently.



As discussed later, (see page 10) making better use of existing buildings could save more than 40% of current energy consumed. However, there is a growing concern that, as energy-in-use diminishes, the embodied energy (used to construct the building), as a percentage of the whole-life carbon footprint, rises. The following table sets out the potential components of embodied energy for an office building. Four items contribute over 70% of the embodied energy.

Embodied energy: Energy components of constructing an office

Roof	0.90%
M & E - ventilation & fit-out	10.70%
Cladding	8.40%
Vehicle deliveries	1.80%
Lifts	1.20%
Waste	1.80%
Piling	4.10%
Steel frame - infrastructure & stairs	35.00%
Concrete works	18.00%
Raised floor	4.60%
Electricity on-site office	4.20%
Walls & partitions	2.10%
Diesel used in plant machinery & office electricity	5.20%

Source: Faithful & Gould (based on University of Bath research), *New Civil Engineer*, 1 October 2009

European Union's plan to strengthen the energy performance of buildings directive

So far there is very little evidence that Energy Performance Certificates have significantly reduced the carbon footprints of buildings.

Display Energy Certificates (and the future Carbon Reduction Commitment in the UK) offers the opportunity to accelerate the reduction in the carbon footprint of buildings.

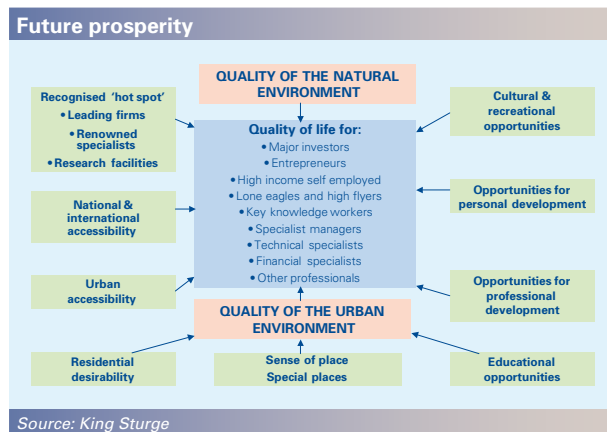
As of summer 2009, 22 of the 27 EU member states had fully implemented the directive to introduction Energy Performance Certificates in 2008, and use Display Energy Certificates for all buildings over 1,000 m² used by the public. The EU aims to make all new buildings zero energy by 2019.

European Parliament's industry research and energy committee voted on the energy performance of buildings directive in March 2009 with the following outcome:

- DECs will be displayed on all buildings larger than 250 m² (not the current 1,000 m²) that are occupied by public authorities.
- EPCs will be displayed on commercial buildings larger than 250 m² (not the currently 1,000 m²) that are frequently visited by the public or where such certificates have been produced on sale, rent or construction (or major renovation) of a building.

Retro-fitting places

The future prosperity of places is a very complex mixture of challenges. The following chart demonstrates the challenges; good building design and master planning can improve the quality of the urban environment and saving energy.



The retro-fitting challenges are many and varied. And the solutions are equally varied. The **Building Sustainability Assessment Tool** (See page 18) demonstrates a decision making process to produce both private and public benefits.





Retro-fitting buildings

Why do green? – key drivers

- Energy
- Carbon
- Cost

While there is a wealth of issues to consider under the banner of 'sustainability', government commitments and forthcoming legislation has brought the focus onto energy and carbon. Buildings account, directly and indirectly, for 44% of the UK's carbon emissions which has led the government to fix firmly on the property sector to help meet its commitment to cut carbon emissions by 80% by 2050.

While government continues to 'lead by best practice' and demonstrate the energy, carbon and operational cost savings that can be achieved by revaluating its building stock, this has failed to deliver the type of reduction required to meet the 2050 target. Inevitably this has led to the introduction of policy and legislation that aims to incentivise the wider property sector to start making these savings by hitting them where it hurts – financially.

While a number of organisations have been dedicated to enhancing their sustainability credentials for a number of years, the downturn has brought about a less dedicated approach to some sustainability issues. However with the introduction of the Carbon Reduction Commitment (see page 30) and other legislation, the issues of energy and carbon is now set to have a financial impact and is fast becoming a priority.

The introduction of the Carbon Reduction Commitment sees the introduction of a cap-and-trade scheme where credits must be purchased for the production of carbon (once qualified). In addition, a league table of the participants performance will start to 'name and shame' those who may have been claiming through CSR policy and advertising that they are 'green' organisations. While the introductory phases of the scheme see only a small percentage of an organisations credit investment being penalised for bottom-half of the

league table performance, after 5 years this can be as much as 50%.

Owning property – value vs demand

While the property market has been attempting to find both the capital and rental uplift for a number of years in sustainable properties, it has thus far been difficult to demonstrate.

However, with increasing pressure from both the EU and UK law, investors/landlords/occupiers are now beginning to prioritise their requirements and the Green Agenda is now starting to reach the top level of the list of requirements and priorities required from their property.

As a result, the market should see an increased demand for green property which currently is a sector very much under-supplied (particularly with a downturn in new commercial developments).

Smart investors and property funds will start to re-evaluate their building stock and look for ways to cost-effectively improve the sustainability performance in order to capture key occupier markets including public-sector and blue-chip organisations who will be looking to improve their own sustainability performance by moving to these properties.

Occupying green property – occupational cost

Energy The security of the world's energy supply is becoming an increasing concern leading to the search for alternative fuel and renewable energy sources. It is becoming clear that with current technological advances, the current energy demand cannot be met by these solutions alone and as a result there is likely to be a shortfall in supply until new technology is discovered and advanced. Unless energy consumption is reduced dramatically in the medium term, sustained demand versus decreased supply may bring about a sharp increase in the cost of energy and thus the operational cost of all buildings. With the energy intensity of modern buildings increasing primarily as a result of increased computer usage and mechanical cooling requirements the potential of increased operational cost may be significant. (See Case Study re: Bristol page 15.)

Carbon The CRC looks set to further increase the cost of energy consumption in property. While the cost of carbon credits required to cover emissions is set at £12/ tonne of CO₂ in the introductory phase, this will be determined by the market place in subsequent years and as the number of credits available decreases the potential for the price to rise substantially increases. In addition, for those who have failed to accept and deliver the requirement to reduce energy consumption and make improvements to their building stock, the penalty for bottom-of-the-league-table-performance in year 5 will be 50% of the initial investment.

EPC/business rates link? The lack of delivery against sustainability targets in the property sector has led many to believe that performance will continue to be minimal until a stronger financial incentive for property owners has been introduced. Many believe that this needs to be done at building level as portfolios of property can be penalised by a small number of poor performers. A suggested method of dealing with this issue is to link the EPC rating of a property to uniform Business Rates, Land Tax or Stamp Duty. If adopted, this in turn could have a more significant impact on property values.

Additional drivers in the public sector

With the wealth of sustainability policy and legislation which has been introduced by the UK Government, internally Government are under increasing pressure to demonstrate leadership in delivering energy efficiency, carbon savings together with an overall improvement in the efficiency of the Government Estate. As a result, the public sector is subject to internal policy and drivers in addition to mandatory participation in the CRC, DECs and EPCs. (See page 35)

The internal policy which has been introduced includes the OGC Benchmarking Scheme (appendix page 28) and SOGE Framework (appendix page 32) which sits against the backdrop of 'High Performing Property 2006'; a framework and implementation plan to deliver a 'fit for purpose' estate with 20% efficiency savings. In addition, public sector organisations and local authorities are required to participate in the CRC scheme regardless of whether they meet the 6,000 MWh threshold or not. The

published league table associated with the scheme will provide some transparency as to whether the previous commitment to benchmarking and energy and carbon emissions reduction has produced any tangible results in this sector.

Un-green property – what next?

Who pays for green?

The introduction of the CRC is likely to bring about a degree of landlord/tenant conflict with regards to who is ultimately responsible for the cost of the CRC and the improvements which will need to be made in order to perform consistently in the league table. While the CRC guidelines clearly put the responsibility and expense of participating with whoever holds the energy contract and therefore pays the bills, in many instances a landlord may pay for the electricity but may have no control over its consumption. Conversely, an occupier may be responsible for the CRC but have limited options of reducing energy consumption without large capital expense, of which they may not benefit from in the long term. It is clear that with the introduction of this scheme an increased dialogue will need to occur between landlords and tenants and the introduction of mechanisms by which this responsibility can be shared fairly, such as green lease clauses.

Sustainability built into your property strategy

Sustainability can be expensive and this is often the case when a broad and unfocussed approach is adopted in order to tackle the many areas covered under the heading of sustainability which may include:

1. Energy
2. Water
3. Waste
4. Carbon
5. Transport
6. Procurement
7. Ecology
8. Occupier wellbeing

One of the most effective ways of tackling this is to undertake a review and formulate a comprehensive



Sustainability strategy which would provide a methodical and actionable approach to delivering improvements in sustainability. In addition the strategy should include the tools and mechanisms by which to achieve each specific objective.

Alternatively, by incorporating this process into a larger scale review of an entire property portfolio, a more comprehensive review can be undertaken to identify “high-risk properties”. This is particularly crucial with the increasing cost of sustainability policy and legislation, as these risks can be identified and eliminated when rationalising property to produce a more sustainable and cost effective portfolio.

- There may be properties identified that after review appear to perform poorly against particularly sustainability criteria that may be more easy to refurb/retrofit up to standard.

In advance of this, the public sector are beginning to advance in their delivery of these sustainability targets and commonly have started this process by formulating a strategy specific to their property portfolio and as part of this improving the quality of baseline data. With a clear and defined sustainability strategy which sets out the milestones and key actions to achieve the adopted targets, there is a clear path to the consistent delivery of these. In addition, this sector has realised the importance of accurate baseline data by introducing the Property Benchmarking Service (appendix page 32), this will enable organisations to identify the task at hand where the starting point and all future savings can be recorded and tracked accurately.

Retro-fitting analysis

The following analysis suggests that, as well as lowering energy use and costs, one of the other main cost and energy benefits from retro-fitting an office building comes from the better space planning of the building. The great enjoyment and productivity from management change, which is frequently associated with office refurbishment, is a significant consequential benefit plus saving energy-in-use.

Typically the annual cost of an office building can be broken down into:

- 80% staff salary costs
- 10% property costs
- 10% other core business costs

There is a generic analysis only to explain the relative headings of expenditure. The following relates to the table of generic analysis which follows.

Property costs

This is very simply broken down into the amortisation of the building structure and fittings and the on-going energy costs.

A new structure by necessity will have a higher annual amortisation compared with an older structure (despite some external repairs being costly for older buildings).

This is particularly applicable if there is expensive air-conditioning to maintain and run.

This analysis suggests a potential 24% saving (100-76) between a new air-conditioned building and an old non-air conditioned building.

Core business costs

By reducing business travel, turning off computer systems at night and controlling the central costs of staff administration (such as not acquiring bottled drinking water and using double sided printing of all documents to save paper), a 10% saving could be made (100-90).

Actual experience indicate far larger savings are possible, such as reducing electricity consumption by over 30%, by shutting computer off at night. (See Case Study re: Bristol page 15.)

Social employment costs

By better space planning the net useable office floor space, a 10% reduction in floorspace could be achieved. But a better designed building could also result in a 5% increase in work–place productivity, a 5% drop in sickness and absenteeism and greater productivity if the commuting journey becomes less stressful.

The overall impact is a 25% saving in cost (800-600). But this impact on the bottom line for both financial costs AND energy used by the buildings is **far greater** than the impact of not using air-conditioning in an older building.

Property costs - as a % of total turnover	£ Before	£ After
Embodied energy		
Amortisation pa		
– Old		60
– New	80	
Energy In-use pa		
– Inefficient air con. heating/lighting	20	
– Efficient air con. heating/lighting		-20% = 16
Total property cost pa	100	76
Core business costs pa (to save 10%)		
– Business travel	40	-10% = 36
– Information & communication technology	30	-10% = 37
– Central costs & admin	30	-10% = 37
Total business cost pa	100	90
Social employment costs pa		
– Space Per Person		
– Reduced by 10%	800	-10% = 720
– Productivity per person +5%		(40)
– Less sickness & absenteeism +5%		(40)
– Less stress Journey to work +5%		(40)
Total social employment cost	800	600
Notional total cost of occupation pa	1000	766 (-23%)

Total cost of occupation

Overall, this simple generic illustration (reducing the total cost of occupation by 23%) demonstrates the largest financial savings are to be made in space planning buildings more efficiently and creating greater staff productivity. A smaller saving is made by retro-fitting a building directly to reduce the energy-in-use but the total carbon emissions could be reduced by more than 40%.

Valuing sustainable investment risk

There is very little, if any evidence, that occupiers (and investors) pay more for a “green building”. The main concern for investors is accelerated depreciation from having to meet ever increasing “green” buildings regulation when alterations to buildings are undertaken.

It is today assumed that the rent or investment value of a prime office must have a good energy rating and perhaps a very good or excellent BREEAM certificate.

The ACTIUM Total Office Cost Survey 2009 (compiled with help from King Sturge) sets out values on this basis.

How do we value (or estimate) the cost of depreciation for a non-Prime older building especially in a recession?

An analysis of the IPD “International Total Occupancy Cost Code” in 2007 revealed a number of key issues which occupiers have to consider (it is recognised this is focused on office property but it provides a generic framework for the analysis of all occupied buildings). These are very similar to the ACTIUM/King Sturge Total Cost of Office Occupation Survey 2009.

Occupancy costs - % IPD – typical example	
Total occupancy cost	100
	Social sustainability costs
National & local taxes	18
Insurance & associated costs	6
	Economic sustainability costs
Security	5
Internal repairs & maintenance	4
M&E repairs & maintenance	9
External repairs	4
Internal moves & reinstatement	2
Cleaning	4
	Environmentally sustainability costs
Waste, water & energy	10
Management	1
NET RENT INCOME	37

In the example provided by IPD, out of the total occupancy costs included, only 37% is eligible as “net rental income” to investors. All the “other non-rent costs” are out-goings which occupiers are expected to meet annually. If these “other non-rent costs” increased the implied “Net Rent Income” to an investor must diminish.



Other non-rent costs

For the purpose of this generic analysis we have divided “other costs” into three different categories. (It is accepted this analysis could be undertaken with different variables, and with different inflation assumptions. Also, we have not differentiated between offices, retail or industrial investments in this generic analysis).

In terms of **social sustainability** we have assumed that national and local property taxes (all the main political parties say then want to raise them!), property insurance and security costs might rise 1% faster than inflation over the next 25 years.

In terms of **economic sustainability** we have assumed that internal repairs, mechanical and electrical maintenance, structural repairs and the replacement of fixtures and fittings might rise by 1% faster than inflation over the next 25 years especially to meet the cost of “green” fixtures.

In terms of **environmental sustainability** we have assumed that cleaning costs, waste disposal, water and sewage costs, and energy might rise by at least 1% faster than inflation over the next 25 years. (The growing global demand for energy from a limited number of unstable geo-political regions, make this a certainty)

Investment analysis

A long-run analysis of the investment rate of return data, over the last 35 years, shows that the real rate of return (after allowing for inflation) on UK commercial property is 5.8%. We have then undertaken a number of calculations to understand the issues:

1. We have calculated the **discounted cash flow** for the “net rent income” of 37, for both a real return of 5% (prime investment) and 10% (secondary investment) – (NB: 5% and 10% are the Internal Rates of Return to calculate a Net Present Value of zero in Real Terms, net of inflation).
2. Based on the 1% real inflation growth for social, economic and environmental sustainability costs (as set out above), we have then recalculated the discounted cash flow to calculate the negative

impact of rising “other non-rent costs” on the investment net present value.

3. The next assumption we have made is that the total occupational cost is not 100 (see table) but for a prime investment 200, yet the “other non-rent costs” remain at a starting point of 63 (to give an initial net rent of 137, not 37) – but we have inflated “other non-rent costs” by 1% (as set out above).
4. Finally, to make the analysis more rigorous, we have made a very general assumption about the investment yield. If we assume that age, obsolescence and depreciation results in a 20% fall in investment value, it is reasonable to raise the investment yield from 5% to 6% for a Prime investment, and also from 10% to 12% for a Secondary older investment, to calculate the negative impact on the investment net present value at the termination of 25 years.

(What we have not undertaken, for the benefits of this generic analysis, is any assessment of future demand and its impact on rental value).

Potential adverse impact on net present value

The following table sets out the results of the above calculations (over 25 years, these are the negative impacts on real values, assuming different occupier costs rises and/or investment yield changes).

Adverse impact on net present value	
Investment yield dcf internal rate of return at	5%
Social costs +1% pa	-12%
Economic costs +1% pa	-6%
Environmental costs +1% pa	-6%
All above (with total occupancy cost = 100)	-25%
All above but – capital rate rises 12% and 6%	-28%
All but prime (with total occupancy cost = 200)	-8%
All but prime (total occupancy costs = 200) with capital rate to 12% and 6%	-12%

Main conclusions

The main conclusions from this analysis, which addresses the fundamental costs of sustainability issues for occupiers and their impacts on investment, are as follows.

- Higher-rented prime investments (such as in Central London) will suffer far less asset

depreciation – perhaps losing only 8% of value.

- Prime investments (producing a real return of 5%) where rents are relatively low will suffer far more investment depreciation than secondary investments– perhaps losing as much as 28% in value.
- Rising social sustainable costs will have a far larger negative impact (losing as much as 12%) than the adverse impact of rising economic or environmental sustainable costs (both around 6%).
- An adverse yield shift (reducing the capital value at the end of the investment in 25 years) will cause far more asset depreciation for lower-rented prime and secondary investments than for higher-rented property.

Office sustainability: University of the West of England research findings

- Over the last two years the University of the West of England and King Sturge have jointly researched the environmental performance of offices in the UK of 10,000 ft² or more.
- The research sample contained 196 buildings in Bristol city centre that were constructed over the last 50 years and that were in use as office space. Out of town there were nine locations in which there were 32 business parks that had been developed since 1981.
- The UWE research concludes the single most important driver over the next ten years will be the carbon regulatory framework. Over the last five years the emphasis has been on measuring carbon, over the next ten years it will be on pricing and taxing carbon.
- **Landlords** may have to bear the higher cost of initial design and construction but then may

Quick office energy efficiency assessment matrix															
	Type of office		Operational energy					Transport energy			Embodied energy				Total
			Energy metering & monitoring facilities	Low carbon heating/cooling system	Efficient lighting & lighting applications	Zero carbon technologies	Minimum 10% local renewable energy	Proximity to public transport	Near to amenities	Cycling facilities & accessibility	Re-use of building structure	Building thermal characteristics	Flexibility of floor space	User-friendliness & productivity	
In town	New (<10 yrs)	BREEAM Outstanding	7	7	7	7	7	7	7	7	2	7	7	7	79
		BREEAM Excellent	6	6	6	6	6	6	6	6	2	6	6	6	68
		BREEAM Very Good	5	5	5	5	6	5	5	5	2	5	6	5	59
		No BREEAM	4	4	4	4	6	5	5	5	2	4	6	4	53
	Existing (>10 yrs)	1990s	5	5	5	5	6	5	5	5	3	5	5	5	59
		1980s	4	4	4	4	6	5	5	5	4	4	4	4	53
		1970s	3	3	3	3	6	5	5	5	5	3	2	2	45
1960s and older		2	4	2	2	6	5	5	5	6	2	1	1	41	
Listed Building	3	3	3	3	6	5	5	5	7	3	3	3	49		
Call Centre	3	3	3	3	6	5	5	5	3	3	3	3	45		
Out of town	New (<10 yrs)	BREEAM Excellent	5	5	5	5	6	3	3	3	4	4	4	4	51
		BREEAM Very Good	4	4	4	4	6	3	3	3	5	5	5	5	51
		No BREEAM	3	3	3	3	6	2	2	2	3	3	3	3	33
	Existing (>10 yrs)	Large	4	4	4	4	6	2	2	2	3	4	4	5	44
		Medium sized	3	3	3	3	6	2	2	2	2	3	3	4	36
		Small	2	2	2	2	6	1	1	1	1	2	2	3	25
		Call Centre	2	2	2	2	6	1	1	1	2	2	2	4	27

Source: King Sturge/UWE Office Sustainability Project 2007/2009



benefit from an increased NET rent at least in part as a result of lower operating costs being borne by the tenant. Better design also implies far less “green” depreciation.

- **Tenants** have a mismatch between the period of likely occupancy (lease term) and long payback periods for green technologies. Depending on their motivation they perceive energy costs as a minor element of occupancy costs and business costs as a whole. However, may be possible to renegotiate the lease contract and use smart metering to influence behaviour and share the financial benefits of reduced energy consumption fairly between parties.
- **Owner-occupiers** may be more willing than either landlords or tenants to pay.
- The matrix table (see page 12) sets out how UWE suggest investment portfolios should review all assets; the numbers and colours are indicative of the results. Each building and portfolio needs to be carefully assessed against this framework.

Global Reporting Initiative

GRI is an independent, global action network and a collaborating centre of the United Nations Environment Programme (UNEP) which has pioneered the development of the world’s most widely used sustainability reporting framework. The framework sets out principles that organisations can then adopt to measure and report on their economic, environmental and social performance. The cornerstone of this framework is known as the G3 Sustainability Reporting Guidelines.

In collaboration with the GRI and a working group of sustainability industry experts including Hermes (with the British Property Federation), Lend Lease, Prologis, Oxford Properties, Arup, Landcom and Citycorp. JLL/Upstream’s role will be to build consensus amongst a geographically diverse group of construction and real estate stakeholders to deliver guidelines which are tailored to the needs of the sector.

A simple guide to sustainable “green” energy

The best way to make a building “green” is not to use energy, by better space planning, occupier

behaviour, energy efficient plant and fabric design. Generating “green” energy may produce a very low or even negative carbon payback.

The following is a quick simple guide to the various ways to produce sustainable energy at a building or city level. (also see page 4).

“Green” energy at a building/city level

Wind power On-shore wind turbines offer the potential to create well below 2W per m² of land area if wind speeds are 6 metre per second, but some areas of the county receive less than 30 days per year – other areas are more than three times this total. Only the North Atlantic Coastal areas (where few live) offer this opportunity for consistent wind energy.

Solar thermal energy Solar panels on roofs (facing south or rotating with the sun) to heat water are increasingly popular. On cloud free days between March and September in North-West Europe hot water and house heating could be sourced in this way, with reduced output at other times of the year.

Photovoltaic “PV” electricity PV panels convert sunlight into electricity. In terms of energy/power produced, they are less than half as efficient as solar thermal energy systems. Owners of P.V. panels in some countries (such as Germany) pay private electricity generators a higher tariff than purchasing power from the grid to encourage new investment. In Southern Europe there is a far greater potential for PV electric power. But there is a worry that the negative carbon footprint to manufacture and install PVs is **greater** than the energy produced during their life, although improvements in manufacturing in recent years have reduced to less than a 10 year carbon payback in a few locations. (See Feed-in tariffs page 32).

Bio mass energy Biomass energy ranges from logs and woodchip heaters - to specially chosen plants - such as oil-seed rape, sugar cane or corn to make fuel oil for cars and aircraft. Maze corn or wheat corn to ethanol is very inefficient. Rye seed, sugar beet and coppiced timber (as grown before the coal age) are more efficient. Sugar cane is by far the most efficient.

Ground and air sourced heat pumps Ground sourced heat pumps are used in many parts of Europe. By using the “reverse refrigerator principle”, low heat (say 5-100 Centigrade) from the ground, air or water can be condensed back up to more than 200c. In the summer, the system can be reversed to cool air. Air sourced heat pumps are becoming very popular – using the same principles.

Combined heat & power Combined heat and power (CHP) systems use local electricity generation as a source of heat. At a building or district level, there are significant opportunities to expand this concept. Distributing electricity via the grid wastes up to 65% of the energy produced at the power source.

Geo thermal power Radio-active decay in the earth crust and the heat from the core is a source of heat (and energy). Some countries have tapped this “steam power” with large power stations for many decades (New Zealand). In Europe many homes in Scandinavia have also used geo-thermal heat for many decades. The Southampton, UK Geo thermal district heating system, contributes 15% of the heat required.

Rain & grey water harvesting (green roofs)

Green roofs Sedum is the preferred plant which is increasingly planted on top of roofs to encourage wildlife, create better roof insulation and reduces the speed rainfall runs-off following heavy rain storms.

Rain water capture Rain water capture is becoming popular as a way to a) save water and b) reduce the cost and energy of pumping water from distant reservoirs. However, storing rain water fit for domestic purposes creates many challenges with the possible growth of green material and bacteria.

Grey water Re-using tap, shower and bath water (as well as rain water) and – following filtration – using it for toilet facilities is now well established in some development, especially in low rainfall areas.

Reed-beds Reed-beds are now well established as a natural method to filter and oxygenate waste

water. Following such filtration water can either be re-circulated into toilet facilities or released in river systems.

Other non-building/city level “green” energy production

Shallow and deep off-shore wind Off-shore wind is steadier and stronger than on land. Only shallow off-shore wind farms are currently financially viable. Off-shore makes little financial sense, especially as 40% or more of the power is lost taking it to consumers; most wind favourable areas are a long way from centres of population.

Wave energy The North Atlantic sea board offers the potential to capture energy – despite that energy being a long way from centres of population and there being calm days when very little wave energy is generated.

Tide energy Tidal power is constant; every high tide is typical about every 12 hours, with spring (higher) tides being higher than neap (lower) every two weeks. The European western seaboard offers the potential for energy production, especially the Strangford Lough in Northern Ireland and the Seven Estuary between Wales and North Devon. Saint Malo in France has operated such a power station for over 30 years.

Hydro electricity Hydro obviously need altitude AND consistent water rainfall to be efficient. Whilst the European North Atlantic sea board can deliver both, other areas of both the UK and EU offer neither.



Case Study: King Sturge office, Bristol



Bristol office

Where better to start demonstrating what can be achieved in existing buildings, than your own offices? Through the implementation of several property management initiatives as part of a wider Energy Management Strategy (energy metering and monitoring, adjustment to plant running timer, PC switch-off, light switching off), a reduction of energy with use of 30% was achieved within 12 months.

Case Study: The Insolvency Service



- The Insolvency Service has recognised and acknowledged that its activities have an impact on the environment and that these can be mitigated against. It operates from 37 offices across the UK, being a mixture of leasehold and freehold.
- They commissioned a sustainability strategy that looks at their drivers, the targets they need to achieve, progress so far against those targets and an action plan of how to get from their current position to those targets.
- The strategy was built upon existing consultations and ideas in The Insolvency Service as well as from external consultants.

- The strategy set clear targets to assist in the scoring of current SOGE benchmarks (see page 32) and aimed to allow for improved reporting both internally to staff and externally to government.
- The action plan is key in allowing for allocating responsibility for the actions, the tracking of the actions and progress against the targets by The Insolvency Service.

Case Study: The River Green Centre, Ackley Heads, Durham – the ultimate new sustainable office?



The River Green Centre, Durham

The River Green Centre, Aykley Heads, Durham is an office development completed in the fourth quarter of 2005, built to the very high environmentally sustainable standards, which go beyond the then current BREEAM excellent standards. It was first reported in our 2005 edition of European Property Sustainability Matters report. It remains a good example of a “green” sustainable office building.

It should be noted this development did NOT use:

1. Photovoltaic cells
2. Ground or air-sourced heat pumps
3. A combined heat and power system
4. Wind turbine power
5. Geo-thermal power

The site, which was formerly in the ownership of Durham County Council, is within walking distance

of central Durham (including the mainline railway station and other public transport facilities).

Part of the building is used by Durham County Council (1,860 m²). The remaining 2,600 m² is designed as highly flexible serviced office space, occupied by small and medium enterprises.



The River Green Centre, Durham

By the use of a rammed wall AND extensive timber the **embodied energy** of construction is reduced. The 'thermo envelope' has also been designed to reduce the embodied energy carbon dioxide created during construction. For instance materials have been sourced locally minimising transport energy and include natural materials like timber. Extensive cycle storage and showering facilities are included, resulting in a reduction in the **transport energy** footprint.

The main characteristics of the environmental **energy-in-use** specification are as follows:

The building is orientated to minimise south-facing solar gain.



Earth-rammed spine wall during construction (left) and after construction (right)

Unusually, it is a timber-frame office building with an earth-rammed spine wall providing substantial thermal mass to both retain heat in winter and reduce solar gain in summer. The post-tensioned in situ concrete slab on in situ columns is also designed to enhance the thermal mass.

It has external walls of larch cladding/lime harl on larch battens and laths. As much timber as possible has been locally sourced. Timber window frames have louvered ventilation sections.



Timber framed windows and louvered ventilation

The roof is covered with a sedum blanket (a living moss-like substance) creating a reduced rate of run-off. Low-flush toilets use recycled rain water.



Sedum blanket green roof

The primary heat source will be two highly efficient wood-burning boilers using recycled fuel supplied locally, supply under-floor heating.

A top-lit double-height circulation spine runs east-west, providing daylight penetration and passive



ventilation in deep plan areas. A water solar energy system will be used to heat tap and shower water.



Left: Under-floor water pipe heating and rammed wall

Right: Solar energy roof water system

A comprehensive data cable and wireless network allows for the monitoring of the building's performance. By using building materials from local renewable sources, and reducing the CO₂ emissions of the building, River Green at Aykley Heads is one of the most environmentally sustainable leased office buildings ever built in the UK.

River Green at Aykley Heads was developed by River Green Developments. It is notable that the office, which has been in use for several years, won a number of architectural awards.

The emphasis has been on reducing the energy need to a) construct the building (the embodied energy) and b) the energy-in-use.

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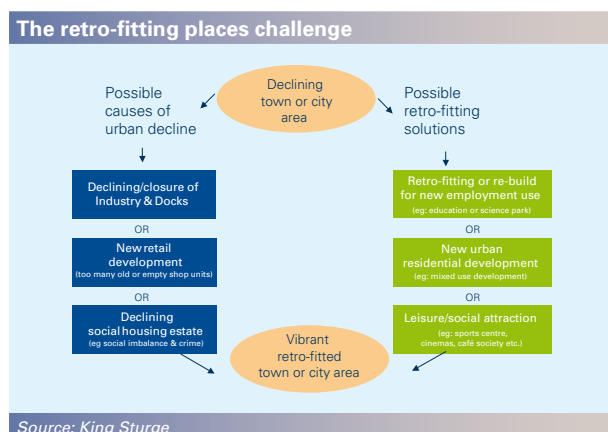
Telephone: + 44 (0) 191 230 2033

Retro-fitting places

Sustainable places

There are an increasing number of sustainable “footprint” tools – most of which focus on energy rather than the much wider issues of creating a sustainable place.

Social sustainability is to do with building better communities and urban areas; buildings and property investment is only a small (but vital) part of that concept, and they all can contribute to saving energy. **More efficient urban areas use less energy.**



Building Sustainability Assessment Tool

The BSAT (Building Sustainability Assessment Tool) is a repeat of a tool put forward by King Sturge in 2003. It aims to account for social, environmental AND economic sustainable issues. As the issue of “sustainability” gains momentum the generic analysis of this tool is becoming increasingly relevant.

The **BSAT (Building Sustainability Assessment Tool)** was developed to provide a means of comparing the two main groups of stakeholders’ interests: those of the building owners and occupiers (**internal stakeholders**) and those of the local and global communities (**external stakeholders**).

Obviously both these categories are very broad and similar exercises could be undertaken comparing the interests of the building owner with the building

occupier, or of the local community with the global community. The tool was developed to examine an **individual building or development**, but the principles could apply to a **city quarter or a wider area**.

Seven key questions were devised for each of the three main sectors, economic, environmental and social, while additional or different questions could be asked for a particular project. The following is a typical example setting out how such an assessment might work.

Questions	Ext 1-5	Int 1-5	Ext. x Int.		
Economic					
1 Is the building efficient	3	2	6	1	6
2 Is there an economic return	2	4	8	1	8
3 Is it efficient land use	4	3	12	1	12
4 Form of tenure	3	5	15	1	15
5 Quality of transport access	3	4	12	1	12
6 Maintenance of fabric	2	1	2	1	2
7 Functional adaptability	5	1	5	1	5
Average figures	3.14	2.86	8.57		8.57
Social					
1 Cultural adaptability	3	2	6	1	6
2 Cultural importance	1	1	1	1	1
3 Lovability	1	2	2	1	2
4 Construction legislation	2	1	2	1	2
5 Occupation legislation	3	4	12	1	12
6 Local amenities	3	1	3	1	3
7 Quality of work environment	3	1	3	1	3
Average figures	2.29	1.71	4.14		4.14
Environmental					
1 Environmental standards	3	2	6	1	6
2 Energy - consumption	3	3	9	1	9
3 Energy - embodied	2	5	10	1	10
4 Hazardous/deleterious	3	1	3	1	3
5 Environmental quality	3	2	6	1	6
6 Ecological	1	1	1	1	1
7 Technological adaptability	4	1	4	1	4
Average figures	2.71	2.14	5.57		5.57
Total	2.71	2.24	6.10		6.10

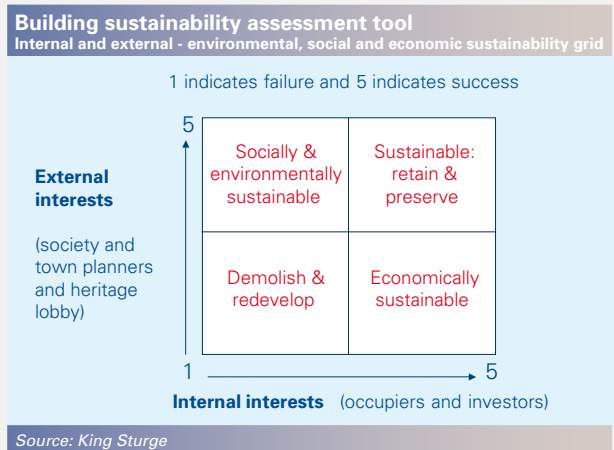
Respondents are asked to score on a 1 to 5 basis, with 5 indicating complete satisfaction of the criterion/question. Scoring is undertaken from **both the internal and external stakeholders’** perspectives, which can be done either by involving both groups, or, where this is impossible, by taking an objective view of their likely responses. The



weighting used for each score is 1 above but could be varied

Responses can be plotted diagrammatically on a square where the baseline x axis represents the views of the external stakeholders and the sideline y axis the internal. The square is divided into four sectors by a central cross.

High scores on both sides indicate agreement that the building/development city quarter is very satisfactory and should be retained in its existing form, while joint low scores indicate the need for replacement. The two most interesting sectors are on either side where there are differences in opinion and where the diagram indicates possible courses of action.



There are numerous other scoring procedures now available for specific aspects. These cover a wide range of issues and provide varying degrees of reliable information.

Some seek to cover all three sectors of environmental, social and economic performance but none seek to resolve either the conflicts which arise from different stakeholders' interests or the differences which can arise between the requirements of the three different sectors.

The Building Sustainability Assessment Tool does not purport to provide an answer. It provides a framework for discussion and agreement on identifying the key issues. It provides an opportunity to retest and refine a proposal, that a building or area may, or may not, be sustainable.



In the example above the four residential examples demonstrate how the tool works.

Top right is Bournville Village. The houses are now almost 100 years old – with the same windows and roof tiles, over 40% is rented as social housing. For occupiers and town planners it is an example of a success.

Bottom right is a new high density housing scheme in Basingstoke. The developer has sold the flats and made money. On the ground floor the “planning requirement” commercial space remains un-let seven years after construction.

Bottom left the former Honeywell HQ in Bracknell has been empty for ten years, unsuitable to occupiers as an office or a residential development. It blights the centre of the town.

Top left the listed “Park Hill Flats” in Sheffield, loved by the planners, hated by the residents and remains part empty and derelict. There is currently no market demand.

Financing urban renewal

Nationally and internationally there are a variety of funds available to create private public partnerships (PPP) to “pump prime” urban renewal where “gap funding” is needed as a result of the private sector not being sufficient to start such developments. (Where end market values are less than construction costs, gap funding is needed).

Of these, the LABV (Local Asset Backed Vehicle)

has become very successful in recent years as a PPP finance solution. Via the EU JESSICA initiative (see page 24) it is now available as a vehicle in all 27 EU states.

Local Asset Backed Vehicles

The LABV is a limited liability special purpose vehicle (legal entity) agreed between public and private sector partners with the specific purpose of carrying out comprehensive, area based regeneration and/or renewal of council assets. In essence the public sector invests property assets into the vehicle which are matched in cash by the private sector partner.

Merits	Drawbacks
Reduces fragmentation and therefore complexity of organisation between key property owners	The vehicle will only enter development opportunities that generate a commercial return or have returns guaranteed by the public sector
Combining private sector skills with the public sector expertise to take forward developments in a timely, effective and appropriate manner	Procurement / establishment costs incurred in set-up
Availability of increased financial resources from the private sector available to invest in sites under public sector control	Gives a single private sector organisation 50% control over public sector sites
Ability to utilise private sector skills in developing challenging sites	Potential conflict between public and private sector aspirations
Safeguarding public sector objectives regarding direction of public sector sites.	
Underpinning value of public sector assets	
Creation of a catalytic development vehicle with access to long term (patient) capital	
Inspiring confidence in the locality for further private sector investment	

The partnership may then use these assets as collateral to raise debt finance to develop and regenerate the portfolio. These activities will

generally be focussed on the property assets themselves but may be extended to include public realm and infrastructure projects.

Recessionary pause for LABVs

LABVs entered the acronym lexicon when the UK Department for Communities and Local Government defined them in the Consultation Paper for City Development Companies.¹ They recognised a growing trend with Regional Development Agencies (RDAs) in particular who were increasingly packaging large portfolios of sites together in order to create economies of scale efficiencies and place making synergies as opposed to breaking up into smaller parts and having to conduct numerous expensive procurements on a site by site basis.

To date there have been five LABVs created in the RDA sector and Croydon became the first council to use this approach when it joined forces with John Laing in a 28 year partnership that aims to transform Croydon town centre.

As long as the economy remained strong the LABV approach suited the public sector very well as UK commercial property prices had never been stronger (in terms of the yield profiles – ie the multipliers used in the property industry to value) and this meant they were in a very strong position to achieve the best prices for the properties they invested into the vehicle. Given the other increasingly recognised wider benefits interest in the concept grew strongly. Then there was a recession.

Recession impacts the value of development sites more deeply than existing buildings. For example whilst residential values have fallen only circa 20%, in the same period the average price for development property and land has fallen 70% or

1 ‘... combining locally-owned public sector assets and equity from institutional investors, established to finance the delivery of major regeneration outcomes. It is envisaged that these vehicles, with their own boards and management teams, are constituted as limited partnerships. Similar funds have already been established at a regional level and have generally been owned 50/50 by the public and private sector partners. Property development and regeneration projects are delivered according to an agreed business plan established at the outset of the vehicle’s life. Returns made by the vehicle are directed back into the LABV and shared on an equal basis between the partners.’



more. Given the primary aim of these LABVs is to bring forward physical regeneration the question increasingly asked is: Should we be investing our property assets – ‘family silver’ – at the bottom of the market? The answer for most councils has quite rightly been no and as such interest in the concept of LABVs has dried up.

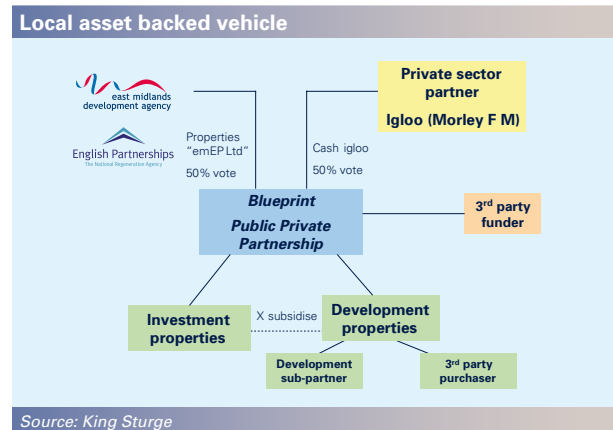
A well structured LABV anticipates the up-lift in market value and asset value created by the urban retro-fitting project.

King Sturge advised the public sector partners in all of the following:

Date and value	Public sector body(s)	Private sector partner	Now trading as
2002 £50m	British Waterways	Amec/ Morley	ISIS Waterside Regeneration
2004 £150m	One NorthEast RDA	UK Land	Buildings for Business
2005 £45m	East Midlands RDA and English Partnerships	Igloo (Morley)	Blueprint
2006 £140m	Northwest RDA	Ashtenne Industrial Fund	Space Northwest
2007 £65m	Advantage West Midlands RDA	Langtree	PxP
2008 £450m*	London Borough of Croydon	John Laing Developments Ltd	CCURV (Croydon Council Urban Regeneration Vehicle)
2008 £500m*	Network Rail	Kier	Solum
2009 £210m*	Devon CC	St Modwen	Skypark
2009	Newcastle City Council	In final stages of procurement	

*Denotes Gross Development Value (as opposed to value of properties invested)

The following “Blue Print” sets out the vehicle financial structure of a LABV.



Source: King Sturge

The benefits

Financial – The private sector development industry have bold financial ambitions and by aligning the public sector’s investments, ownership and returns in a single vehicle owned 50/50 by each side there is the potential for very significant growth by leveraging with 3rd party debt. There is also the safety and clarity of a 50/50 holding structure, avoiding the unreliable and discredited ‘overage’ approach.

Regeneration - Large scale property partnerships are attractive to major institutional funds, enabling a long term investment view to be taken. This is critical to regeneration, which when combined with the shared public/private sector board control, enables a holistic approach that balances financial, physical, social and economic considerations.

Risk - A first class development partner is procured and incentivised to deliver long term growth which is underpinned by the synergistic effect of sites in single ownership with the funding and expertise to deliver comprehensive, area-based regeneration.

Local Incentive Backed Vehicles

The LIBV (Local Incentive Backed Vehicle) is based on the LABV (Local Asset Backed Vehicle) with one fundamental difference that protects the public sector from ‘selling the family silver’ at the bottom of the market.

LIBVs rely heavily on the use of ‘property options’² as incentives for the private sector to take a 10-20 year investment commitment in a given location. This creates the platform for genuine partnership working between the public and private sectors, and the potential for a more holistic aspects of regeneration – such as place making – to be properly considered, funded and managed over the long term.

The emergence of LIBVs

The fundamental difference lies in the public sector offering options, as opposed to actually transferring the properties on day one of the partnership. Instead, the public sector body procures a single development partner for a series of sites – ideally in close ‘place making’ proximity - and offers the options to purchase, at some future point in time (subject to a set of criteria and milestones being met) thereby providing powerful ‘incentive’.

The private sector partner is procured, a relationship built and initial regeneration can begin which - involves understanding the context:

- local consultation
- master-planning and
- site-specific planning consents.

² Property options enable a landowner to purchase a site (or sites) at some future time and may be structured to be conditional upon the purchaser meeting certain pre-agreed milestones.

The approach is also attractive to the private sector. It would prefer to avoid paying for sites up-front. When market conditions improve, the sites and delivery process will be ready to respond, options will be exercised, ownership transferred and a price paid in line with the improved macro market conditions.

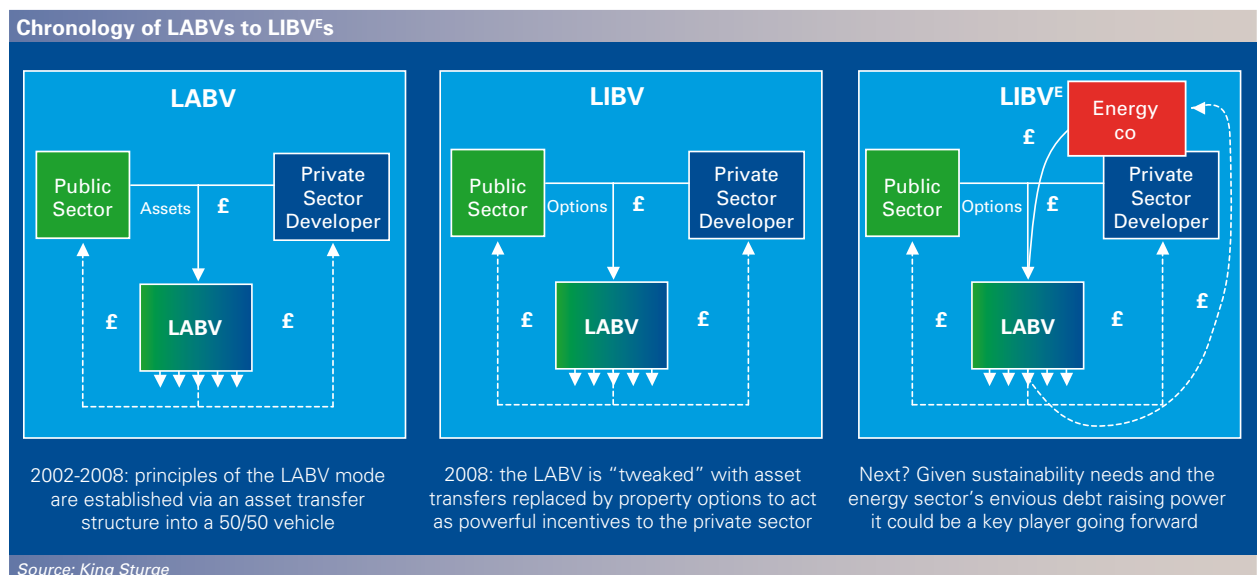
LIBVs also meet directly the key suggestions of the British Property Federation’s regeneration manifesto (‘Expand equity sharing – encouraging councils to donate land to make development viable’) and complement the use of Tax Increment Finance mechanisms that are currently the subject of discussion and implantation (see page 27).

Furthermore it is an ideal option to structure a relationship between the UK Homes & Communities Agencies (HCA’s) new ‘super panel’ of developers being set up and the hundreds of billions of pounds worth of property in public sector ownership.

LIBV Case Studies

Network Rail Network Rail completed a LIBV partnership with Kier in respect to the regeneration of six station sites across London / South East.

The vehicle provides a means to generate returns for both partners and allow reinvestment in the railway; combines Network Rail’s property estate and expertise of rail related projects with Kier’s





expertise of commercial property development; and will provide a catalyst for sustainable regeneration in these areas and further sites in the future.

The portfolio will have a gross development value in excess of £500 million

Devon County Council Skypark was established as a Limited Liability Partnership with two 50% shareholders – Devon County Council and St Modwen to deliver the development of a 38 hectare site adjacent to Exeter International Airport with planning permission for 140,000m² of business space.

The principal outcome of the partnership is the realisation of the Council's desire to develop Skypark and influence the wider economic development of that part of the county. The land the Council commits to the partnership will be valued on a phase by phase basis with land drawn down as key milestones are achieved over the life of the partnership.

The partners will share equally in development profits.

Local Incentive Backed Vehicles and energy

The following series of charts show the evolution of a LABV to a LIBV energy incentive model.

European cities which lead the way in terms of energy conservation (and some are included in the "transition towns" movement include:

- Malmö Harbourside, Sweden
- Hammarby Stockholm, Sweden
- Freiburg, Germany

The following photograph shows how a community building in Freiburg also generates photo-voltaic energy from its roof using incentive based "green" energy feed in pricing. (See Feed-in tariff page 31 for the UK).



Freiburg, Germany - Vauban New Town former French barracks

Case Study: the Livinggreen Centre at Morden Hall Park, UK

The National Trust at Morden Hall Park, UK has been successful in securing a grant of £630,000 from INTERREG IVB (European funding) (see page 41) to create a **sustainable Livinggreen Centre to provide a resource for the local community**. This project started in November 2008 working with European partners and will be completed in 2013.

The aim of the project is to promote and implement sustainable renovation practices in 19th century buildings. This will demonstrate as many energy saving techniques as possible in the renovation of the historic buildings.

Some examples currently being investigated are different types of insulation, water harvesting, using water harvesting, using water power to generate electricity, solar panels to heat water and ceramic stoves to provide additional heating in public areas.

The restored stable yard will have the smallest carbon foot print possible. After the project information will be available about what worked best, what you could use at home or at work to reduce your energy usage. The partnership of European countries will share best practice to ensure each Livinggreen Centre is as good as it can be.

Sustainably renovated buildings can help to reduce CO₂ emissions by saving energy and resources as well as preserving the cultural and architectural heritage of buildings.

Five other heritage buildings, in five countries, will be part of the project. The European partners have different expertise and will advise each other on the renovation of these demonstration buildings. The other buildings are in: Delft in Holland, **Lille** in France, **Antwerp** in Belgium and **Ludwigsburg** in Germany.

In Modern Hall Park the 19th century stable yard and waterwheel are going to be renovated to become the **hub of the park** in the form of a centre for sustainable living.

JESSICA (Joint European Support For Sustainable Investment in City Areas)

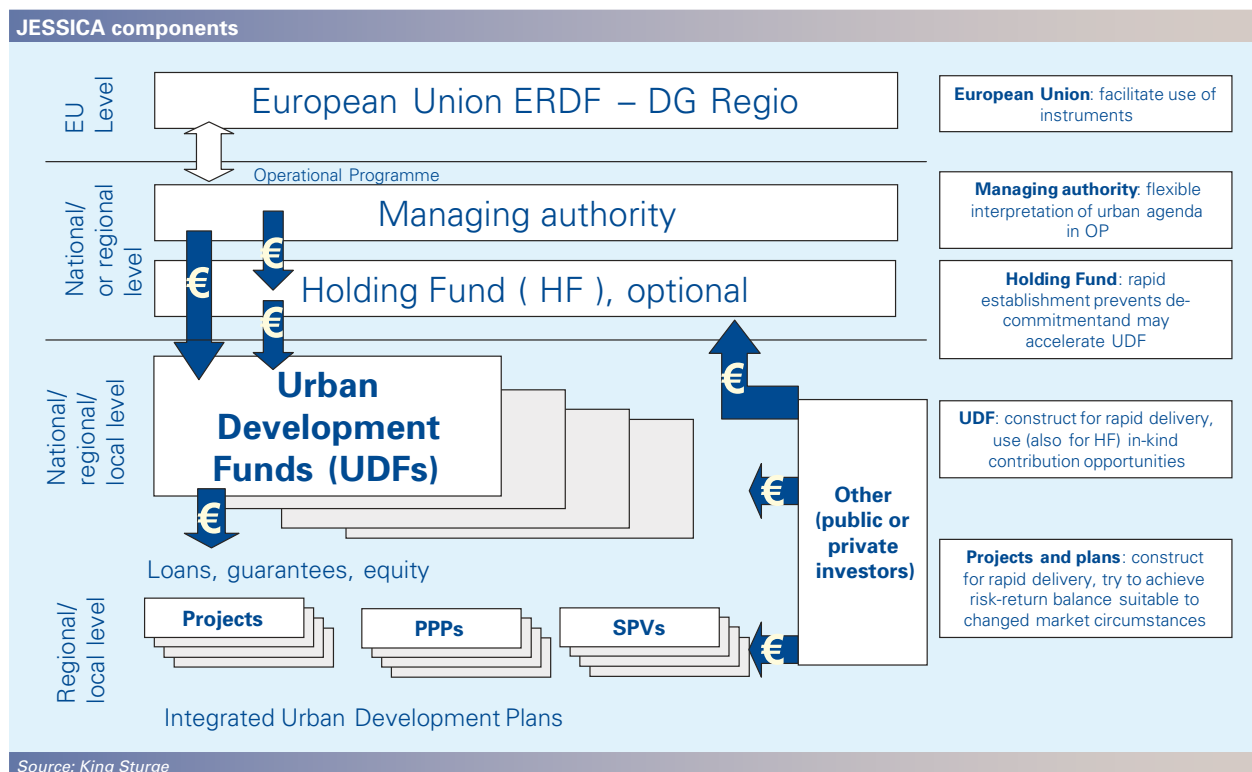
JESSICA is an innovative instrument that is being used for the first time in the 2007-13 EU Structural Funds programming period and whose implementation entails a profound cultural shift regarding the way in which assistance is provided. For member states or regions genuinely interested in the initiative, detailed evaluations studies are being carried out.

JESSICA is designed to increase the use of financial engineering instruments within the framework

of Cohesion Policy such as Local Asset Backed Vehicles (LABVs).

It permits that managing authorities use some of their structural funds allocations to invest in revolving funds – rather than once-off grant financing – and so **recycle financial resources in order to enhance and accelerate investment in urban areas.**

- In response to the financial and economic crisis, the regulatory framework has been revised in order to increase the efficiency of European resources.
- Council Regulation (EC) No284/2009 of 7 April 2009 amending Regulation 1083/2006 (General Regulation) concerning certain provisions relating to financial management.
- Regulation (EC) No397/2009 of the European Parliament and of the Council of 6 May 2009 amending Regulation 1080/2006 (ERDF Regulation) as regards the eligibility of energy efficiency and renewable energy investments in housing.
- To help the authorities in the member states for the EU exploit financial engineering mechanisms





to suppose investment in sustainable urban development in the context of cohesion policy, and to provide new opportunities to managing authorities responsible for the next generation of cohesion policy.

JESSICA is a new policy initiative of the European Union supported by the European Investment Bank (EIB). Member states are allowed to use some of their structural fund allocations – principally those supported by the European Regional Development Fund (ERDF) but also, where appropriate, the European Social Fund (ESF) – to invest in Urban Development Funds (UDFs) to accelerate investment in urban areas.

Other International Financial Institutions (IFIs), as well as the European banking and private sector, are also expected to follow suit. The Council of Europe Development Bank (CEB) has already agreed to participate.

The road to JESSICA

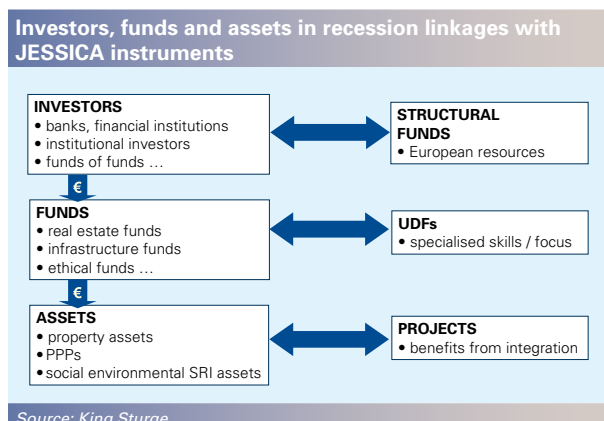
The Bristol Accord established the principles of a common EU urban policy, a consensus was reached on the need to both increase the momentum of urban renewal and regeneration across Europe and supply investment funds to support relevant projects in pursuit of more sustainable urban communities.

JESSICA has been launched with a view to leveraging in additional resources that are suitable for public-private partnerships (PPPs) and, in general, for urban renewal and development projects in the regions of the EU.

How JESSICA works

JESSICA allows the use of interim payments by MAs from structural funds to invest in UDFs through recyclable and recoverable financial mechanisms, essentially equity, guarantees and subordinated loans.

Their common features are a market driven approach, as they are expected to at least recover their investment, and the fact that they must invest in projects within well-defined integrated urban renewal and development plans.



An evaluation study, commissioned by DG REGIO, has been launched by the EIB to establish the feasibility and ensure effective implementation of the JESSICA initiative.

A preliminary phase, started in September 2006, provides guidance on how to develop JESSICA, in particular on how recyclable financing mechanisms could work in practice to promote urban renewal. The background information will be collected from a small but representative sample of member states and regions.

JESSICA offers new opportunities for the use of structural funds for the integrated development of urban areas and allows a continuous availability of funds for revenue generating components of urban renewal and development programmes. Building on a market-driven approach that is essential for the success of UDFs the structural funds used in JESSICA are expected both to leverage substantial amounts of investment into areas in need of social cohesion and to speed up their transformation.

JESSICA is complemented by EU JEREMIE (see page 40) and JASPERS (see page 40).

UK Urban Policy and Initiatives

Town & Country Planning Act 1990 (Section 106 Agreements)

Section 106 Agreements occur where local authorities, in granting planning permission, achieve planning and other community gains at the expense of developers. Agreements are negotiated, usually in the context of planning obligations to secure a contribution from developers for the specific infrastructure requirements for their schemes or to compensate the local authority for any adverse effects as a result of the development.

Merits	Drawbacks
Well established in the uk	Highly criticised by private sector arising out of uncertainty of s.106 Costs until late in the development process
A proven source of funding with a direct link to the local communities	Income is limited to external costs arising out of development rather than sharing in value generated from granting of planning consent or provision of infrastructure
Local authority able to negotiate direct with land developers.	Often cover only a small percentage of major infrastructure costs
	Highly complex with interpretation varying between planning authorities (research shows s.106 Costs can vary from 3 to 15% of development costs)
	Anticipated that much if not all of s.106 Monies will be top-sliced by the mooted pgs (see below)

Planning Tariff or 'Roof Tax' (Community Infrastructure Levy)

This pilot scheme was introduced in Milton Keynes in 2006. It is based on a contribution of £18,500 per dwelling on 15,000 homes to be built by 2016 and a further £33.46 million contribution from employment development to support the requisite infrastructure.

The tariff raised is spent on infrastructure e.g. road improvements, public transport improvements, subsidy and patronage schemes, hospital infrastructure, universities, voluntary sector capacity building and voluntary sector small grants funding.

Milton Keynes is a pilot for this approach for the UK. We are not aware of any other locations that have adopted the roof tax / planning tariff approach.

The Community Infrastructure Levy (CIL) comes into force on 6 April 2010. It empowers local authorities in England and Wales to use the CIL to take over part of the role of Section 106 agreements.

- It enables local authorities to levy a charge on most development
- The charge will be based on a simple formulae related to the size and character of the development
- The proceeds will be spent on infrastructure to support development (roads, drainage systems, schools, hospitals etc...)
- The rate of the CIL will be set subject to a public enquiry before an "independent person" whose report will be binding on the charging authority
- The charge will apply when planning permission is granted, based on the number of "chargeable units"
- Payment is due on commencement of the development.

The CIL allows planning permission to be granted in some cases where it might have been refused.

CIL could be levied as a certain amount per dwelling or per square metre of development, following the example of existing 'tariff' schemes introduced by some local planning authorities.

The government wants CIL funds to unlock development. But if the levy is set too high, it might cause some development to become unviable. Because it is the purpose of CIL to ensure that more development is delivered, the level of CIL must be set to ensure it supports and does not prevent development. In setting charges, charging authorities will therefore need to take account of



land value uplifts in there area. There is a discussion as to whether developers can re-claim unspent CIL funds (which is possible with Section 106 payments).

Merits	Drawbacks
May be structured to ensure tariff paid by a specified date in order to prevent land banking	There is a time lag before receipt of the funds as development takes place
Predictable revenue return from a very simple system	Requires a 'banker' (in Milton Keynes, English Partnerships has adopted this role) to forward fund the infrastructure and later recover costs from subsequent tariff payments
Incentivises regeneration as developers have certainty over cost, thereby reducing risk of development	May only work in green-field locations and in buoyant property markets
Can cover larger geographic area than used by s.106 agreements	There is a major challenge to establish appropriate land and building values relevant for the full life of the development period – perhaps over more than 20 years.
It is an option only which some local authorities may not use	Some estimates indicate the Milton Keynes roof tax will only meet 15% of infrastructure costs

TIFS (Tax Increment Financing) and Local Authority Bonds

TIFs have been popularised in the US as a key means of delivering infrastructure. It is accepted, that in most instances, when a piece of infrastructure is delivered, there is an increase in the value of surrounding property (e.g. some estimates indicate the £3bn Jubilee line extension generated £15bn worth of property value uplift). These increased values in existing property and investment in new development creates more taxable property, thereby increasing tax revenues. These increased tax revenues are the "tax increment" securitised to finance debt issued up-front to pay for the infrastructure project.

Today 49 states in the US use TIFs. Their use has grown out of a background of a reduction in federal (centralised) funding for development-related

activities which parallels the UK at the current time. Chicago alone has over 100 TIFs which raise tax receipts totaling upwards of \$325 million per year.

The UK Budget Report 2009 suggested developing this concept in the UK. There have been a large number of local authorities showing interest in this new funding vehicle, such as Cambridge considering introducing a road congestion charge/ tax using a TIF structure.

Merits	Drawbacks
Enables up front financing of infrastructure	'Gentrification' criticism from some US quarters as property values inevitably rise and push out some low-income residents from rented properties
Practical, simple and easily understood mechanism	May require central government guarantees initially
Transparent and equitable as the beneficiaries of the almost inevitable rise in property values subsequent to infrastructure delivery (i.e. land owners) indirectly meet the cost of delivery	
Difficult to avoid as the tax increment is attached to existing (rates) tax collection systems	
Proven method in US (and similar system in Australia) that could be transferred to the UK	

BIDS (Business Improvement Districts)

Business Improvement Districts (BIDS): The concept of BIDs started in Canada in 1971 and became widely used in the USA during the 1980s and 1990s. The following summarises the concept:

When the idea of Business Improvement Districts (BIDs) was first mooted in the UK in 2004, there was much excitement over the potential for local empowerment and improvement in areas which wanted to enhance their trading environment.

A BID is a precisely defined geographical area of a town, city, or another commercial district where ratepayers have voted to invest collectively in local improvement in addition to those delivered by local government.

Put more simply, a BID is a mechanism that allows local businesses to agree to pay a supplement on their rates bill to provide additional services and facilities to improve the trading environment. If the BID is passed by a vote, businesses within the BID area will be required to pay a levy on their rate bills.

Who pays is made clear at the time of the vote and all affected ratepayers will have the opportunity to vote on the BID proposal. If the proposal passes the vote, the local authority will collect the BOD levy and distribute funds to the BID. The BID can last for no more than five years, and will either be dissolved at the end of its term or it has the option to seek a new electoral mandate.

The Local Government Act, which received its royal assent on 18 September 2003, introduced BIDs to the UK with some 29 BIDs, operating since early 2005. Although the experiment is still in its infancy, a new report on the development and implementation of BIDs in England has been published by DCLG.

The findings suggest that there is still a long way to go in raising levels of awareness of BIDs, and potential lack of resources to undertake the development activities.

Research by York Consulting for DCLG, reveals that BIDs are not surprisingly dominated by the retail, hospitality and leisure sectors. As the report suggests, the BIDs that have developed to date have been the result of a combination of factors, but the principal driver has been a clear set of needs or issues affecting the businesses in a particular area.

BID area composition by category of ratepayer

Public Sector	3%
Wholesale, storage and distribution	3%
Leisure	4%
Banking, finance and financial services	5%
Other	6%
Bars, clubs, hotels and catering	10%
Manufacturing	12%
Office-based services	18%
Retail	39%

Source: DCLG & Property Forecasting Magazine March 2007

Office of Government Commerce

The UK Office of Government Commerce (OGC) launched in June 2009 a major campaign as part of the Pan-Government Energy Project to improve the way the public buys its energy. It is part of the Government's Operational Efficiency Programme. Government currently spends an estimated £3.8 billion a year on energy, and is aiming at annual savings of £320 million by 2012. (see page 32 re SOGE).

OGC is an independent office of HM Treasury, established to help government deliver best value from its spending. The OGC works with central government departments and other public sector organisations to ensure the achievement of six key goals:

- Delivery of value for money from this party spend;
- Delivery of projects of time, quality and cost, realising benefits;
- Getting the best from the government's £30bn estate;
- Improving the sustainability of the government estate and operations, including reducing carbon emissions by 12.5% by 2010-11, through stronger performance management and guidance;
- Helping achieve delivery of further government policy goals, including innovation, equality and support for small and medium enterprises (SMEs);
- And driving forward the improvement of central government capability in procurement, project and programme management, and estates management through the development of people skills processes and tools.

In addition OGC is aiming to benchmark the efficiency of the total UK Government estate. Its aim are:

- Annual programme of performance measurement and benchmarking of property on the government's civil estate for all office buildings over 500 m².
- To get out a framework and direction for

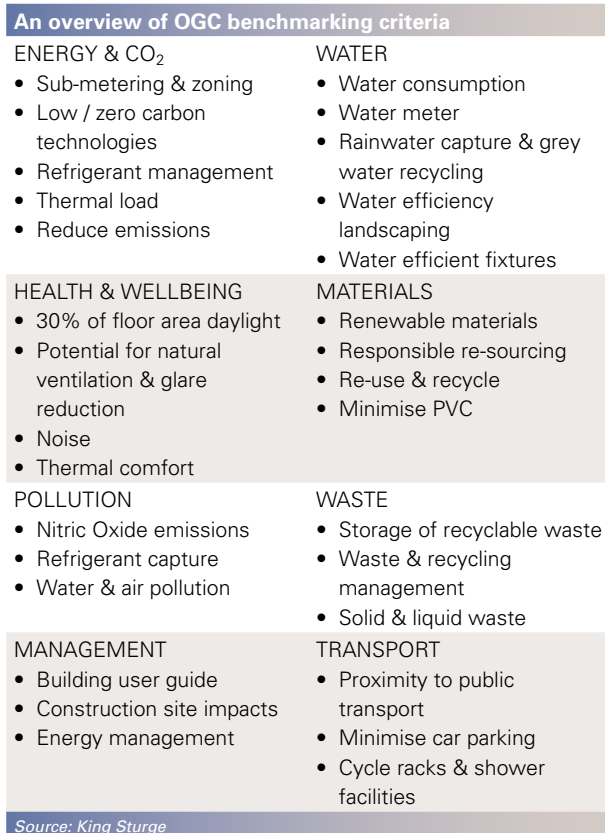
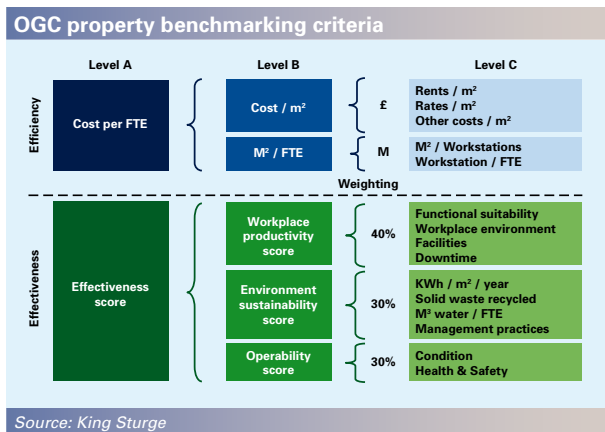


improving strategic property asset management across central government.

- The creation of a performance model which provides users with a clear statement to identify and highlight issues of relative property efficiency and effectiveness.
- The creation of key performance indicators (KPIs) related to cost efficiency, space usage, efficiency, environmental sustainability and effectiveness.

The proposed outcome of this project are:

- A rationalised “fit for purposes” government estate
- Property asset management positioned as a strategic arm of business delivery
- Hard edged performance data driving continuous improvement
- Improved stewardship and accountability
- 20% annual efficiency savings driven out of the estate



APPENDICES: Green benchmarks, legal requirements & EU programmes

European Union's plan to strengthen the energy performance of buildings directive

So far there is very little evidence that Energy Performance Certificates have significantly reduced the carbon footprints of buildings.

Display Energy Certificates (and the future Carbon Reduction Commitment in the UK) offer the opportunity to accelerate the reduction in the carbon footprint of buildings.

As of summer 2009, 22 of the 27 EU member states had fully implemented the directive to introduce Energy Performance Certificates in 2008 and use Display Energy Certificates for all buildings over 1,000 m² used by the public. The EU aims to make all new buildings zero energy by 2019.

European Parliament's industry, research and energy committee voted on the energy performance of buildings directive in March 2009 with the following outcome.

- DECs will be displayed on all buildings larger than 250 m² (not the current 1,000 m²) that are occupied by public authorities.
- EPCs will be displayed on commercial buildings larger than 250 m² (not the currently 1,000 m²) that are frequently visited by the public or where such certificates have been produced on sale, rent or construction (or major renovation) of a building.
- The full harmonisation of Energy Performance Certificates across Europe was rejected although there will be moves towards a common methodology over time allowing greater comparability between member states.
- A major renovation would be defined as where the cost are more than 20% of the buildings value (defined on basis of current construction costs) or
- Where 25% of the buildings envelope is added which would have a direct impact on the energy performance of the buildings, a certificate is needed.
- The directive will allow the use of estimated energy performance for buildings which are un-built or un-finished.
- All new buildings will be zero energy by 2019 (although there is still a major debate on what is meant by zero energy or zero carbon).
- There should be minimum energy performance requirements on technical systems within buildings such as heating systems, air conditioning units.
- The definition of low or zero carbon (LZC) buildings should be defined by member states, but should be in accordance with the overall EU targeted principles.
- There are a number of ideas relating to finance instruments for energy efficient improvements. Other suggestions include owners and tenants of commercial buildings should be obliged to exchange information regarding actual energy consumption.
- There should be more information on cost effective ways to improve the energy performance of buildings.

- Smart metres should be installed in all new buildings and all buildings under going renovation, plus the installation of active controlled systems to both measure and control energy consumption.
- Commission should establish by 30 June 2010 common minimum standards for the content and presentation of certificates and for the accreditation of experts. (all certificates should be available both in the language of the owner and of the tenant in order to make recommendations easily understood). Also, Member States shall recognise certificates issued in another Member State in accordance with these guides.
- A "net zero energy building" is where the overall annual primary energy consumption is equal or less than the energy production from renewable energy sources on sites. There is much to discuss as to whether this is a) efficient way to create renewable energy and b) the definition of "on site" sources.

However there are concerns that implementing the current directive is very challenging. Other EU countries are worried about the administrative burden of the next directive. A further reading of the next Energy Performance of Buildings Directive between the EU Energy Council and the Parliament is expected to take place during 2010.

Carbon reduction commitment - UK

The CRC (Carbon Reduction Commitment) Energy Efficiency Scheme is a legally binding energy saving scheme which comes into force in April 2010 but is based upon energy use in the 2008 calendar year. Approximately 5,000 organisations will participate in the scheme which involves buying and trading carbon credits and an annual league table from April 2011, but with reporting required from April 2010.

Organisations will be required to participate in the scheme if they consume and pay the bills of more than 6,000 MWh of half hourly metered electricity a year. If an organisation reaches this level of electricity consumption they will be required to purchase 'carbon credits' for ALL energy use annually.

In addition, an annual league table will be published to highlight the best and worst performers with regards to year-on-year carbon reduction. Participants will receive either a monetary reward or penalty from their base carbon credit investment based on their position in the league table.

Public sector organisations and local authorities will be required to participate in the scheme regardless of whether they meet the threshold or not. As a result public sector organisations will need to form close partnerships and robust reporting structures to ensure penalties are not incurred.

In addition, poor data quality with regards to energy and carbon, will result in financial penalties which will be subsequently published in the press. Fines will continue until this issue is rectified so it is vital that prudent data capture and management processes are implemented in advance of this scheme.



Feed-in tariffs - UK

The Renewable Energy Strategy (RES), and the UK Low Carbon Transition Plan, sets out the UK's 2020 vision for the switch towards a low-carbon economy and society. The effort to increase renewable energy consumption is shared across the EU with the 2009 EU Renewable Energy Directive setting a binding target of achieving 20% of energy consumption from renewable sources by 2020. The UK must source 15% of its energy from renewable sources.

The RES sets out the overarching policy framework for how we will achieve this and identifies a possible scenario of where this renewable energy will come from. It proposes that:

- Over 30% of our electricity may come from renewables compared to 5.5% in 2008. This could be made up from 29% large scale electricity generation and 2% small-scale electricity generation;
- 12% of our heat may come from renewable sources; and
- 10% of road fuel may come from sustainable biofuels.

The Renewables Obligation (RO) will introduce Feed-In Tariffs (FITs) to provide better support for small-scale renewable electricity. FITs have been used for many years in other countries of Europe such as Germany.

The Energy Act 2008 established enabling powers for the introduction of FITs to supplement the RO and incentivise small-scale low-carbon electricity generation, up to a maximum limit of 5 megawatts (MW) capacity (50 kilowatts (kW) in the case of fossil-fuelled combined heat and power). It also provides powers to implement a new Renewable Heat Incentive (RHI) aimed at renewable heat installations of all sizes, which we will implement by April 2011.

The key FIT design aspects proposed are:

- A fixed payment from the electricity supplier for every kilowatt hour (kWh) generated (the "generation tariff");
- A guaranteed minimum payment additional to the generation tariff for every kWh exported to the wider electricity market (the "export tariff");
- Generators receiving FITs will also benefit from on-site use: we propose that where they use the electricity they generate on-site they will be able to offset this against electricity they would otherwise have had to buy;
- We will support the following technologies from 2010: wind; solar PV; hydro; anaerobic digestion; biomass and biomass combined heat and power (CHP) and non-renewable micro CHP; and
- We will aim to design FITs as a simple and user-friendly system in order to maximise take-up. At the same time we will, in the short term, have to rely on some existing procedures under the RO to ensure that the system is ready for implementation by April 2010.

From 1 April 2010 installations under 50kW installed capacity which are eligible for FITs will only get the option of receiving FITs. However we propose that larger installations (with installed

capacity of between 50kW to 5MW)¹ will retain the right to choose between the RO or the FITs.

Currently in consultation till the end of 2009, the scheme is due for implementation in April 2010.

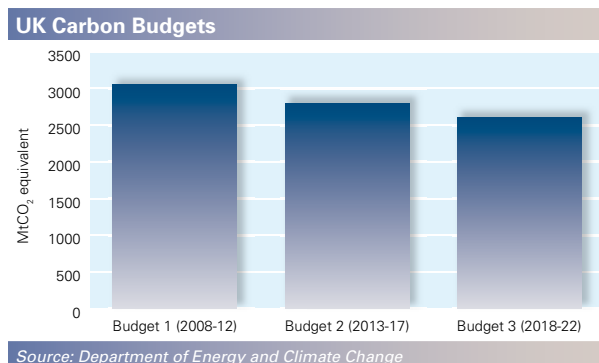
Building Regulations – changes to Part L - UK

The Building Regulation Part L together with the accompanying approved documents regulates the carbon dioxide emissions from buildings through the control of energy use in buildings. Part L is currently being revised and is undergoing consultation for launch in 2010. The current proposals include the following:

- A design stage carbon dioxide emission rate calculation which must include supporting information to provide building control with an understanding of the key features of the Part L compliance strategy;
- Higher performance characteristics will be credited in the carbon calculation to encourage the use of accredited construction details;
- The wider use of competent person schemes;
- Renovation work will include better guidance and definitions;
- Changes to performance characteristics will reflect 'as installed' performance;
- The interpretation of the energy efficiency requirements will be clarified, making it clear that they apply to all buildings where energy is used to condition the environment;
- Removal of statutory exemptions from the energy efficiency requirements, notably historic buildings;
- Improved compliance guides.

The Climate Change Act and Carbon Budgets - UK

The Climate Change Act marks the first introduction, anywhere in the world, of a long-term legally binding framework to manage and respond to climate change. One of the key provisions included the setting of carbon budgets every five years, providing legally binding carbon limits.



The 2009 Budget set the world's first carbon budgets and measures to encourage energy efficiency and low-carbon growth. Recognising that saving energy is the most effective mechanism for cutting carbon emissions and saving money the Budget announced £375 million to support energy and resource efficiency in businesses, public buildings and households over

the next two years, and £70 million for decentralised small-scale and community low-carbon energy. In addition the first three carbon budgets were announced at levels which lead to an overall reduction in carbon emissions of 34% by 2020 (with regard to 1990 levels) as set out in the graph below.

SOGE Framework - UK

The **Sustainable Operations for the Government Estate (SOGE)** was introduced by the Prime Minister in 2006. All central government departments and executive agencies agreed to the framework and signed up to deliver these common targets which are designed to improve sustainable operations across the government estate. (See page 28 re OGC benchmarking initiative) The SOGE Framework is divided into three sections:

- **SOGE Targets** – performance focused targets including the reduction of carbon emissions from offices and road travel, waste reduction, increased recycling and reduced water consumption.
- **Mandated Requirements** - including requirements for new builds to meet BREEAM excellent standards, and for central departments to have implemented accredited environment management systems.
- **Sustainable Procurement Action Plan (SPAP) Commitments** - detailing key initiatives to strengthen leadership across central government, build capacity in terms of skills and knowledge and raise standards through mandatory requirements for purchasing goods (including 'quick wins' product standards).

Departments collect and submit data annually in a 'SOGE return'. The Sustainable Development Commission's report on the overall government progress against SOGE annually.

Section one of the SOGE framework details the SOGE targets which are divided into three key areas;

- **Climate Change and Energy** - The government has recognised that it is important to reduce its energy consumption, increases energy efficiency and source energy from alternative renewable sources.
- **Sustainable Consumption and Production** - The inefficient use of resources and irresponsible practices when disposing of waste are having a detrimental impact on the environment. Tackling the production and disposal of waste is crucial in achieving a successful waste management system and in achieving more sustainable patterns of consumption and disposal.
- **Natural Resource Protection** - The SOGE natural resource targets deal with the preservation of biodiversity and reduction in water consumption.

BREEAM – UK



Introduction

The Building Research Establishment's environmental assessment method (BREEAM) was introduced in the 1990s and was the first tool to offer an environmental label for buildings in the UK. BREEAM is continually updated in line with UK Building Regulations and is now used all over the world.

Tools

BREEAM can be used to assess the environmental performance of any type of building, new and existing under the following tools:

- BREEAM Courts
- BREEAM Healthcare
- BREEAM Industrial
- BREEAM International
- BREEAM Retail
- BREEAM Prisons
- BREEAM Offices
- BREEAM Schools
- BREEAM Further Education
- BREEAM Multi-residential
- BREEAM The Code for Sustainable Homes
- BREEAM EcoHomes
- BREEAM EcoHomes XB
- BREEAM Bespoke

2008 changes

BREEAM released an update of their assessment tools on 1 August 2008. As opposed to the usual biennial revisions, the release was described as including a number of major "step changes".

- Division of energy and water into two separate elements
- Change to environmental weightings
- Introduction of mandatory credits
- Two-stage certification process (design and post-construction)
- CO2 emissions benchmarks (aligned with EPCs)
- A new "Outstanding" rating, now the highest rating available

These changes are described as bringing BREEAM in line with energy performance certificates, setting more stringent assessment standards with regards to energy, water and CO2 emissions. As a result, many of those buildings previously assessed using BREEAM may no longer be able to reach the same rating if reassessed under the newly updated 2008 tools.

Assessment criteria

Each BREEAM tool looks at the same broad range of environmental issues. The table below details the assessment categories with some examples of the issues requiring consideration.



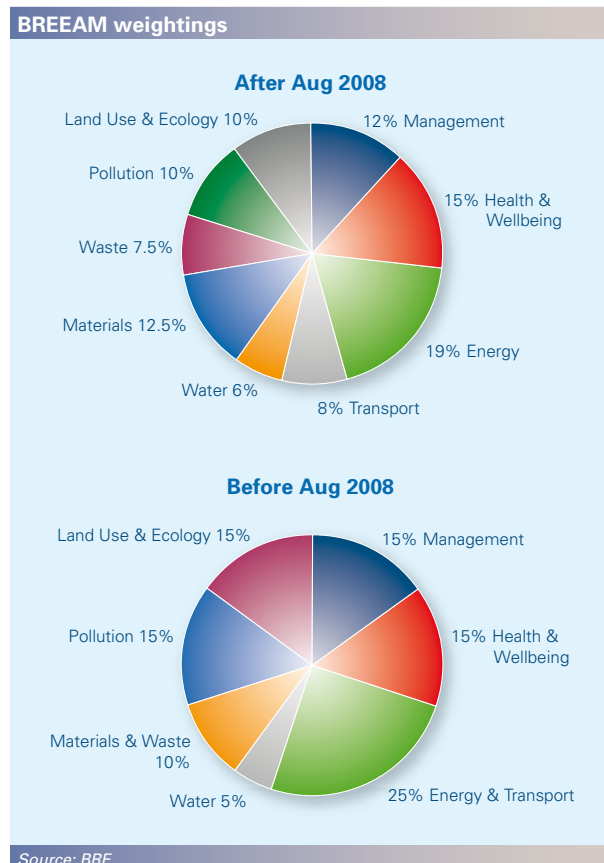
BREEAM Assessment Criteria	BREEAM Rating* and Mandatory Credits				
	P	G	VG	E	O
Energy					
• Reduction of CO ₂ emissions				✓	✓
• Sub-metering of substantial energy uses			✓	✓	✓
• Low or zero carbon technologies				✓	✓
• Sub-metering of areas / tenancies					
Health and Wellbeing					
• 80% net lettable floor area adequately daylight					
• Potential for natural ventilation					
• High-frequency lighting	✓	✓	✓	✓	✓
• Microbial contamination	✓	✓	✓	✓	✓
Materials					
• Materials specification – major building elements					
• Responsible sourcing of materials					
Management					
• Commissioning	✓	✓	✓	✓	✓
• Considerate Constructors				✓	✓
• Building User Guide				✓	✓
• Publication of building information (BREEAM Education only)					✓
• Development as a learning resource (BREEAM Education only)					✓
Pollution					
• NOx emissions of heating source					
• Flood risk/water run-off					
Land Use and Ecology					
• Mitigating ecological impact			✓	✓	✓
• Enhancing site ecology					
• Long-term impact of biodiversity					
Transport					
• Provision of public transport					
• Cyclist facilities					
Waste					
• Storage of recyclable waste				✓	✓
Water					
• Water consumption		✓	✓	✓	✓
• Water meter		✓	✓	✓	✓
Innovation					
• Reduces impact on environmental/social issues					
• Sustainability benefits demonstrated and objectively assessed					
• Exemplary level in a number of credits					

* P: Pass G: Good VG: Very Good E: Excellent O: Outstanding

Rating

BREEAM assesses buildings against set criteria which are subsequently subject to a set of environmental weightings. The

individual weighted criteria scores are subsequently totalled to give a final score out of 100 which is divided into six rating categories.



BREEAM Ratings	% Score
Unclassified	<30
Pass	≥30
Good	≥45
Very Good	≥55
Excellent	≥70
Outstanding	≥85*

* There are additional requirements for achieving a BREEAM Outstanding rating.

Assessment

The BRE holds a comprehensive list of all licensed assessment organisations.

Further Information

BRE, Garston, Watford WD25 9XX
 Tel: 0044 (0)1923 664 462
 Web: www.breeam.org
 Email: breeam@bre.co.uk

The Code for Sustainable Homes – UK

Introduction

Background information and a general overview of BREEAM tools can be obtained from the previous section, "BREEAM". More specific details regarding the Code for Sustainable Homes (CFSH) are detailed here.

The CFSHs was launched in December 2006 setting out the national standard for residential construction in England. It replaced BREEAM's EcoHomes in April 2007, and in February 2008 the Government made rating against the code mandatory for all new homes. However, currently there is no particular level that needs to be achieved.

Assessment criteria

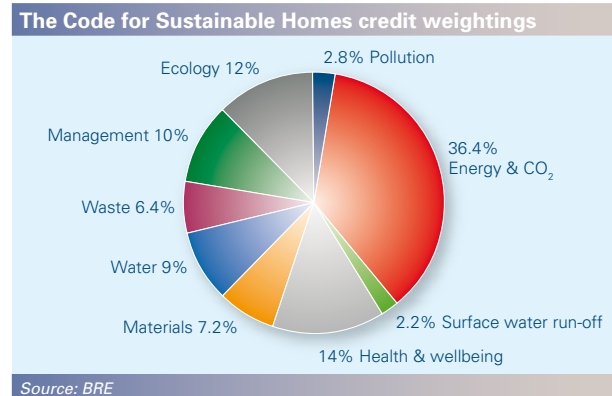
The table below details the assessment categories with some examples of the issues requiring consideration.

CFSHs Assessment Criteria	Mandatory*
Energy and CO₂ Emissions	
<ul style="list-style-type: none"> Dwelling Emission Rate (CO₂) Energy labelled white goods Low or zero carbon technologies 	✓
Health and Wellbeing	
<ul style="list-style-type: none"> Lifetime homes Daylighting Sound insulation 	✓
Materials	
<ul style="list-style-type: none"> Environmental impact of materials Responsible sourcing of materials 	✓
Management	
<ul style="list-style-type: none"> Construction site impacts Considerate Constructors Scheme 	
Pollution	
<ul style="list-style-type: none"> Global warming potential of insulants NO_x emissions 	
Ecology	
<ul style="list-style-type: none"> Ecological value of site Building footprint 	
Surface Water Run-Off	
<ul style="list-style-type: none"> Management of surface water run-off from developments Flood risk 	✓
Waste	
<ul style="list-style-type: none"> Construction waste management Storage of non-recyclable and recyclable household waste Composting 	✓ ✓ ✓
Water	
<ul style="list-style-type: none"> Indoor water use External water use 	✓

* There may be additional mandatory requirements for individual rating levels of the scheme

Rating

The Code for Sustainable Homes credit weightings

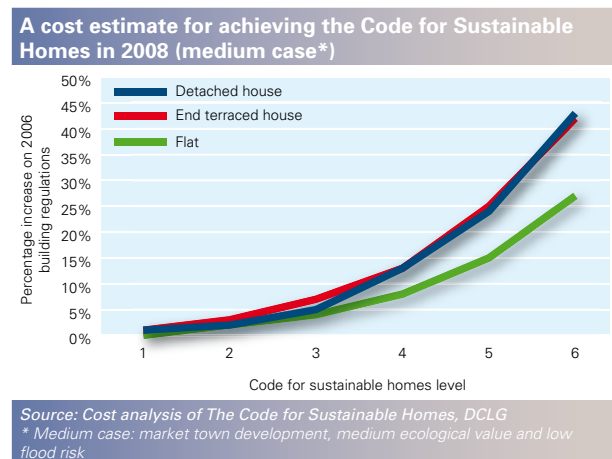


The Code for Sustainable Homes Rating	% Score
Level 1 (*)	≥36%
Level 2 (**)	≥48
Level 3 (***)	≥57
Level 4 (****)	≥68
Level 5 (*****)	≥84
Level 6 – Zero Carbon (*****)	≥90

Assessment

Assessment of the code is performed at two stages, an initial assessment which gives rise to an interim certificate and a final assessment after completion of construction, where final certification is carried out.

CFSH and zero-carbon homes



The Government's policy to achieve zero-carbon homes by 2016 (England) and 2012 (Wales) will requires all new housing to achieve Level 6 of the code by these dates. However, the DCLG/Cyril Sweett assessment for English Partnerships and the Housing Corporation (2007) suggests that, especially at a time when capital values and land values are falling, meeting the additional cost of achieving Level 6 of the code is expensive. The cost of meeting the UK Government's "zero-carbon" target could raise construction costs by 25%-42%.



Energy Performance Certificates (EPCs)

Introduction

The Energy Performance of Buildings (Certificates and Inspections) (England and Wales) Regulations 2007 implement article 7 of the EU directive. Implementation of Energy Performance Certificates (EPCs) began on 6 April 2008 with full execution achieved by 1 October 2008 in England and Wales. From 1 October 2008 all buildings whenever sold, built or rented will need an EPC.

EPCs provide an energy efficiency rating for properties together with recommendations for their improvement. The actual certificate is made up of a number of components depending on the building type:

Non-domestic buildings	Domestic buildings
Energy performance asset rating	Two ratings, an energy efficiency rating and an environmental impact rating
Technical information and comparable benchmarks	Typical energy use and CO ₂ emissions
Typical ratings of similar, newly built and existing buildings	Assessment of key building elements
Accompanying recommendation report with detailed building information and recommendations for improving the energy performance (divided into short (<3 years), medium (3-7 years) and long-term (>7 years) payback periods)	Recommendations for improving energy performance (divided into low and high cost measures and those measures required to achieve the highest possible standards)
Certificate valid for ten years	Certificate valid for three years.

Rating methodology

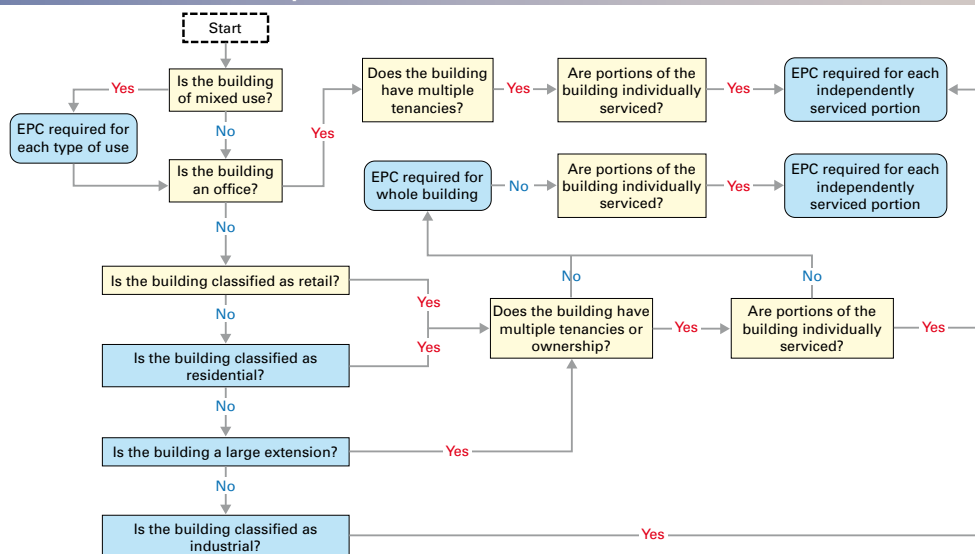
EPCs calculate the intrinsic performance of a building as built, often referred to as the asset rating. Simulation tools calculate the building's demand for heat, ventilation, cooling, lighting and hot water, based on its geometry, construction and a set of standardised conditions (weather, occupancy and different activity areas). Actual KgCO₂/m² figures are produced from this data and are used to calculate the rating.

EPCs are produced using the Simplified Building Energy Model (SBEM) for non-domestic buildings and the Standard Assessment Procedure (SAP) for domestic buildings both developed by the BRE.

Assessment criteria

EPC Assessment – Required Information Checklist	
Non-domestic buildings	Domestic buildings
<ul style="list-style-type: none"> Scaled plans of the building – including floor to ceiling heights Construction details M & E plant type and efficiencies <ul style="list-style-type: none"> pump rating boiler seasonal efficiencies fan power ventilation rates 	<ul style="list-style-type: none"> Building materials Thermal insulation levels Ventilation characteristics and equipment Control and efficiency of heating equipment Solar gain Fuel type used for space and water heating Ventilation and lighting Renewable technologies
Where any information is unavailable, default values are substituted resulting in a poor rating	Independent of household size and composition, geographical location, ownership and efficiency of electrical appliances, individual heating patterns and temperatures

Energy Performance Certificate (EPC) requirements



Source: CIBSE

Rating

Non-domestic building		
Energy Performance Asset Rating		Score
A+	More energy efficient	Net zero CO ₂ emissions
A		0 - 25
B		26 - 50
C		51 - 75
D		76 - 100
E		101 - 125
F		126 - 150
G	Less energy efficient	Over 150

Domestic building				
Energy Efficiency Rating		Environmental (CO ₂) Impact Rating	Score	
A	Very energy efficient – lower running costs	A	Very environmentally friendly – lower CO ₂ emissions	92 - 100
B		B		81 - 91
C		C		69 - 80
D		D		55 - 68
E		E		39 - 54
F		F		21 - 38
G	Not energy efficient – higher running costs	G	Not environmentally friendly – higher CO ₂ emissions	1 - 20

Assessment

Assessment and certification is carried out by energy assessors who are members of an accreditation scheme and have the appropriate qualifications or competence. A list of accredited energy assessors and their contact details is held by each individual accreditation scheme.

All EPCs and associated advisory reports are recorded in a central database. Domestic certificates are held in the HCR Register and non-domestic EPCs and DEC are held in the Non-Domestic Energy Performance Certificate Register.

Fee

The cost of an EPC varies according to the size, type, complexity and location of the property. The predicted cost for a standalone EPC for the “average” home is approximately £100.

Enforcement is the responsibility of Trading Standards for the sale and letting of existing buildings and Building Control for new construction. In most cases, the penalty for non-compliance is 12.5% of the building’s rateable value, with a default penalty of £750 where the formula cannot be applied. The range of penalties under this formula is subject to minimum and maximum values of £500 and £5,000.

Further information

Department for Communities and Local Government
 Tel: 0044 (0)845 365 2468
 Email: help@epbduk.info
 Web: www.communities.gov.uk/epbd

Display Energy Certificates (DEC)

Introduction

The Energy Performance of Buildings (Certificates and Inspections) (England and Wales) Regulations 2007 (the “Energy Performance Regulations”) implement article 7 of the EU directive in England and Wales. It requires DEC to be displayed prominently in all publicly accessible and public authority occupied buildings in England and Wales over 1,000 m² as of 1 October 2008.

A DEC gives the operational rating of a building, standardised so that one building can be easily compared to another building of a similar type.

The certificate features:

- Energy performance operational rating
- Total CO₂ emissions
- Previous operational ratings (last three accounting periods)
- Technical and administrative information
- Accompanying recommendation report with recommendations for improving energy performance (fabric and services)
- Certificate valid for one year and advisory report valid for seven years

Rating methodology

A DEC displays the actual energy performance of a building while in operation compared to EPCs which measure the theoretical energy use. The rating is based on the metered energy used by the building in the previous 12 months, which is compared to established benchmarks to produce an efficiency rating. DEC are produced using the Operational Rating Calculation (ORCalc).

Assessment criteria

DEC Assessment – Information Checklist

- Identification of the building and activities for which it is used
- Internal floor area
- Actual meter readings or consignment notes for all fuels used in the building for one full calendar year
- Details of the building’s assets that affect energy consumption
 - Insulation
 - Building services
 - Etc



Rating

The system rates buildings from A to G, similar to the system used to rate domestic white goods.

Energy Performance Operational Rating	Score
A More energy efficient	0 - 25
B	26 - 50
C	51 - 75
D	76 - 100
100 would be typical	
E	101 - 125
F	126 - 150
G Less energy efficient	Over 150

Assessment

DECs are produced by energy assessors who are members of an accreditation scheme and have appropriate qualifications and competences. A list of accredited assessors and their contact details is held by each individual accreditation scheme. DEC's and their associated reports are recorded in a central database, the Non-Domestic Energy Performance Certificate Register.

Fee

The cost of obtaining a DEC will vary according to the size, type, complexity and location of the property.

The local Weights and Measures Authority (Trading Standards Officer) is responsible for enforcing certification. A penalty of £500 can be issued for failing to display a DEC at all times in a prominent position, and £1,000 for failing to possess or have in control a valid advisory report. In addition to these penalties, it will be necessary to commission the documents.

Further information

Department for Communities and Local Government
 Tel: 0044 (0)845 365 2468
 Email: help@epbduk.info
 Web: www.communities.gov.uk/epbd

DGNB-Seal – Germany



Introduction

The German Sustainable Building Certificate (DGNB-Seal) was developed by the German Sustainable Building Council (DGNB) and the German Federal Ministry of Transport, Building and Urban Affairs (BMVBS). It was introduced in June 2008 and is the German certification system for the sustainability of buildings.

Tools

The DGNB-Seal assessment tool can be used for a variety of building types anywhere in the world.

Assessment criteria

The table below details the assessment categories with some examples of the issues requiring consideration.

DGNB-Seal Assessment Criteria

Ecology

- Demand for primary energy and drinking water
- CO₂ emissions
- Noxious and hazardous materials

} Indicated target values

Economy

- Life-cycle costs
- Running and cleaning costs
- Maintenance costs

Socio-cultural and Cultural Aspects

- Thermal comfort
- Fresh-air supply
- Daylight
- Acoustic comfort
- Absenteeism

Engineering

- Maintenance and repair of deployed materials
- Structural design
- Construction characteristics of the building shell

Processes

- Design and construction
- Integral planning

Location

- Public-transport links

Rating

DGNB-Seal Rating	Overall Score (%)
Bronze	
Silver	Currently Under Discussion
Gold	

Assessment

The assessment system is currently being tested on 30 projects; certification results will be published in January 2009.

Further information

German Sustainable Building Council DGNB
Stuttgarter Engineering Park/ Step 9
Wankelstr.14
D-70563 Stuttgart
Germany

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HQE – France



Introduction

The Association HQE introduced the Haute Qualité Environnementale (HQE) in 1996. It provides an independent third party assessment of environmental quality in the built environment. HQE is a voluntary management tool based largely on the international standard ISO14001. HQE is a project methodology rather than an assessment tool. It provides environmental standards for the planning, design and implementation of a building design at construction or refurbishment.

Tools

Certificates may follow successful integration of the HQE approach into a building scheme. Upon completion, certification may be achieved under the following building types:

- Offices and Educational Buildings
- Commercial
 - Centres and shopping
 - Shopping areas of activity
 - Shops at the foot of a building
- Health Establishments
 - Hospitals and clinics
 - Polyclinics
 - Care facilities
- Logistics
- Hospitality
 - Hotels and tourist homes
 - Hostels
 - Tourist villages
 - Residential housing
 - Leisure management
- Operational
 - The above tools for existing buildings

Assessment criteria

The table below details the assessment categories with some examples of the issues requiring consideration.

HQE assessment criteria

Eco-Construction

- Relationship of the building with the environment
- Facilities (life-cycle, maintenance and emissions)
- Waste

Eco-Management

- Energy management
- Water
- Activities waste
- Maintenance
- Comfort

Health

- Air quality
- Health conservation

Rating and Assessment

HQE does not provide a rating or label for environmental buildings. However, certification of adopting a HQE approach can be sought after a building is complete.

Further Information

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75016
Paris
France
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Web: www.assohqe.org

LEED – US



Introduction

The Leadership in Energy and Environmental Design (LEED) Green Building Rating System was launched in 1998 and was first used to certify a project in 2000. The tool was developed by the United States Green Building Council (USGBC), which undertakes the formal assessment and certification.

LEED has been adopted by State and local government for public-owned and public-funded buildings. In addition, there are LEED initiatives in federal agencies, including the Departments of Defense, Agriculture, Energy, and State. It is used increasingly on privately owned buildings and has been adopted and used in over 40 different countries around the world.

Assessment methodology and tools

LEED is a voluntary, third-party certification process for developing high-performance, sustainable buildings. It is a nationally accepted benchmark which recognises the design, construction and operation of green buildings.



LEED certification is available for the following building types:

- New construction
- Major renovation
- Existing buildings
- Commercial interiors
- Core and shell
- Schools
- Homes
- Neighbourhood development (pilot)
- Retail (pilot)
- Healthcare (pilot)

Assessment criteria

The LEED assessment tool assesses projects against credits grouped under six categories. While all credits are weighted equally, the different number of credits which make up each category is in effect a weighting method. While there are some mandatory credits shared across the LEED tools, most of the tools also have more specific mandatory criteria. The table below details the assessment categories with some examples of the issues requiring consideration.

LEED Assessment Criteria	Mandatory
Indoor Environmental Quality	
• Environmental Tobacco Smoke (ETS) control	✓
• Outdoor air delivery monitoring	
Sustainable Sites	
• Alternative commuting transportation	
• Heat Island Effect (roof and non-roof)	
• Reduction in light pollution	
Water Efficiency	
• Water efficient landscaping	
• Water use	
Energy and Atmosphere	
• Minimum energy performance	✓
• Management of energy efficiency	✓
• Refrigerant management	✓
Materials and Resources	
• Recycling management	
Innovation	
• LEED accredited professional	

Rating

The system rates buildings from 1 to 100 and is banded to give a particular rating. Each tool has slightly different scoring bands.

LEED Certified Rating – New Construction	Score
Certified	26 -32
Silver	33 – 38
Gold	39 - 51
Platinum	52 - 69

Assessment

Projects must register with the USGBC to obtain a LEED rating. To date there have been a total of 2,858 projects certified under the different LEED tools

Further information

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 1800 Massachusetts Ave, NW
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 Washington
 DC 20036
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 Fax: 001 202 828 5110
 Email: leedinfo@usgbc.org
 Web: www.usgbc.org

Protocol ITACA – Italy



Introduction

The federal association of the Italian regions and provinces released Protocollo ITACA (Innovation and Transparency of the Contracts) for the first time in 2003.

Tools

To date, two simplified versions of the tool have been created.

Assessment criteria

The protocol measures performance under 12 key criteria divided into two groups. These criteria are weighted and sub-criteria are set within performance scales of between -2 and +5. The table below details the assessment categories with some examples of the issues requiring consideration.

Protocollo ITACA Assessment Criteria	
Consumption of Resources	Environmental Burdens
Hot Water	Greenhouse Gas Emissions
Natural Lighting	Solid Waste
Electricity from Renewable Resources	Liquid Waste
Maintenance	Outside Permeability Areas
Winter Energy Conservation	
<ul style="list-style-type: none"> Air conditioning energy use (winter) Thermal transmittance of building envelope 	
Conservation of Summer Energy Consumption	
<ul style="list-style-type: none"> Solar radiation control Thermal inertia 	
Eco-compatible Materials	
<ul style="list-style-type: none"> Renewable materials Recycled materials 	
Drinking Water	
<ul style="list-style-type: none"> Conservation of potable water for irrigation Conservation of drinking water for indoor use 	

Further information

Institute for Innovation & Transparency of Contracts & Environmental Compatibility - ITACA
 Via Della Mercede, 52
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 CF 96321370585, Italy
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 Fax: 0039 (0)6 678 1759
 Email: info@itaca.org
 Web: www.itaca.org

JEREMIE: (Joint European Resources For Micro to Medium Enterprises)

JEREMIE is the initiative of the European Union's Directorate General for Regional Policy (DG Regio) and the EIB (European Investment Fund and European Investment Bank).

JEREMIE provides the framework for a series of coherent financial actions to improve the financial environment for small business (medium, small and micro enterprises, known as SMEs) at national, regional and local level. Increasing small businesses' access to finance and risk capital enables economic growth and competitiveness.

JEREMIE'S resources are derived from EU structural funds for the funding period 2007-13.

JASPERS (Joint Assistance in Supporting Projects in European Regions)

JASPERS seek to develop this cooperation in order to pool expertise and resources and to organise them in a more systematic way to assist member states in the implementation of cohesion policy.

The aim of JASPERS is to offer a service to the member states, targeting regions covered by the new Convergence Objective for the period 2007-2013. The service will help the authorities in the preparation of major projects for submission to the Commission. In this way, the service will help to improve the quantity, quality and rapidity of projects coming forward to approval, for the benefit not only of the member states and regions directly concerned but also for growth and convergence in the Union as a whole.

EU Community Strategic Cohesion

The Community Strategic Guidelines on Cohesion 2007-2013

The Community Strategic Guidelines contain the principles and priorities of cohesion policy and suggest ways the European regions can take full advantage of €308 billion that has been made available for national and regional aid programmes over the next seven years. National authorities will use the guidelines as the basis for drafting their national strategic priorities and planning for 2007-2013, the so called National Strategic Reference Frameworks (NSRFs).

According to the guidelines and in line with the renewed Lisbon strategy, programmes co-financed through the cohesion policy should seek to target resources on the following three priorities.

- Improving the attractiveness of member states, regions and cities.
- Encouraging innovation, entrepreneurship and the growth of the knowledge economy.
- Creating more and better jobs by attracting more people into employment entrepreneurial activity.

The guidelines seek to provide a balance between the twin objectives of the growth and jobs agenda and territorial cohesion.



European Investment Bank

The **European Investment Bank** was created by the Treaty of Rome in 1958 as the long-term lending bank of the European Union.

The task of the bank is to contribute towards the integration, balanced development and economic and social cohesion of the EU member states.

The EIB raises substantial volumes of funds on the **capital markets** which it lends on favourable terms to projects furthering EU policy objectives. The EIB continuously adapts its activity to development in EU policies.

The EIB:

- Enjoy its own legal personality and financing autonomy within the EU.
- Operates in keeping with strict banking practice and in close collaboration with the wider banking community, both when borrowing on the capital markets and when financing capital projects.

Regional Policy of the European Union

The **Regional policy of the European Union** has the stated aim of improving the economic well-being of certain regions in the EU. Around one third of the EU's budget is devoted to this policy, the aim of which has been stated to be to remove the disparities in wealth across the EU, restructure declining industrial areas and to diversify rural areas which have declining agriculture.

The most significant enlargement of the European Union took place in May 2004 with ten new member states, most from eastern or central Europe, followed by accession of Bulgaria and Romania in January 2007. Most of these states are poorer than the existing members and the impact of this means that the EU's average GDP per capita. Some regions in the earlier EU-15 no longer qualifying for the Objective One to Three finance.

Objective One This previously covered regions most at need of the regional policy until 2006. To qualify for objective one status the GDP per capita for the region had to be below 75% of the EU average.

Objective Two This covered regions at a smaller level than those with objective one status. Industrial areas qualified for objective two status if unemployment was higher than the EU average.

Objective Three This objective aimed to support the modernisation of education, training and employment policies and systems.

Since 2007 the regional policy has been as follows:

- The **European Fund for Regional Development** (EFRD), the **European Social Fund** (ESF) and the **Cohesion Fund** contribute to three objectives: Convergence, Regional Competitiveness and Employment, and European Territorial Cooperation from 2007 to 2013.
- The rationale of the **Convergence objective** is to promote

growth-enhancing conditions and factors leading to real convergence for the least-developed member states and regions.

INTERREG

The INTERREG IVB North West Europe Programme is a financial instrument of the European Union's Cohesion Policy. It funds projects which support trans-national cooperation. The aim is to find innovative ways to make the most of territorial assets and tackle shared problems of member states, regions and other authorities.

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Notes

Notes

LOCATIONS

UK

England • Scotland • Wales

THROUGHOUT EUROPE

including:

Belgium • Bulgaria • Croatia • Czech Republic • France • Germany • Greece
Hungary • Ireland • Luxembourg • Netherlands • Poland • Romania • Russia
Serbia • Slovakia • Switzerland • Turkey

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