10
Sustainability and property development

As has been discussed above, attempts to achieve sustainable development are shot through the planning system and therefore affect developers at every turn when they are seeking to bring schemes forward. More than just a regulatory issue, however, it is a theme which cuts across every aspect of the work of property developers these days, because those who fund, purchase and occupy them, as well as those who build them and provide the necessary professional advice, increasingly require sustainability issues to be fundamental.

Much has been written about how sustainability affects the property development process, including specialist books and journal articles. The purpose of this chapter is briefly to summarize the key sustainability issues as they affect the property developer, rather than to provide a fully comprehensive analysis of the history and philosophical foundation to them. The chapter is divided into the following topics:

• Sustainability in the property lifecycle

• Principal sustainability issues affecting property developers

• The regulatory environment for sustainability

• Commercial sustainability considerations

• Practical sustainability issues for developers

• Key issues for property sectors.

Sustainability in the property lifecycle

The property lifecycle can be described in various ways, but a simple schematic description is provided below in Figure 10.1. Every aspect of the property lifecycle is affected by sustainability, and those who are involved in decision-making at every stage of the lifecycle need to consider its implications. They must also appreciate that, to greater or lesser degrees, because of the very cyclical nature of the lifecycle, their decisions and actions will have consequences in all other stages of it. This is perhaps more true for developers than all or most other actors within the property lifecycle.
We can see how sustainability affects each aspect of the lifecycle by asking simple questions, the answers to which have consequences for sustainable development at least, as follows:

**Site**

- Where is it in relation to other developments?
- How will people get to it?
- Will development lead to loss of greenfield land?
- Could other amenities be lost or gained by the development?
- Will development lead to brownfield use and possible decontamination?

**Design**

- Will the scheme incorporate ‘green buildings’?
- Does layout and orientation maximize the beneficial use of natural resources?
- Will materials used minimize the negative use of natural resources?
- Can ecological resources be enhanced?
- What effect will the scheme have on water use and purity?
• How much energy will the scheme require to build and operate?

Construction

• How much waste will be created by contractors?

• Will water courses be affected by construction activity?

• Are the contractors likely to be considerate to the scheme’s neighbours?

Occupation

• Have tenants’ aspirations been considered?

• Could ‘green lease’ clauses be relied on to reduce environmental damage?

• Are effective environmental and building management systems in place?

Investment

• What is the obsolescence risk of the building?

• Are environmental issues considered as components of a prime property?

• What are the value implications of ‘green’ specifications?

Redevelopment/refurbishment

• Is saving resources via refurbishment rather than redevelopment an option?

• Are materials going to be reused or recycled?

• Does the site need decontamination?

Vicious circle of blame

For some time, there has been an ignorance surrounding sustainability issues in the property world, but this is diminishing. As with many ‘new’ concepts, this ignorance was a contributor to a general unwillingness to adopt change. For some time, people sought to apportion blame for this on different actors within the property development process, and the ‘vicious circle of blame’ was drawn up, as shown in Figure 10.2 below.

As the concept of sustainable development has progressed, the property world has become more amenable to the production of appropriate buildings. The first wave of demand for the procurement of sustainable buildings came from the public sector, at both national and local governmental levels, as edicts from central government for the public sector to reduce its
environmental impact took effect. Subsequently, as the private sector began to see the benefits of sustainable buildings, the next wave of procurement of them came chiefly from owner-occupiers. These organizations were able to derive maximum benefits from the buildings because of their long-term involvement in them. Herein we see one of the problems commonly perceived with sustainable buildings – investment in them often requires the ability to wait for relatively long-term payback periods. Developers, particularly those involved in speculative schemes, do not have the time to wait for long-term returns on capital employed which are anticipated and therefore have to front load the returns into higher prices for completed schemes or to leave out those elements which have higher upfront costs. This is very often a matter of perception and anticipation based upon a poor understanding of how to procure sustainable buildings which is still not uncommon, but is thankfully less so than was the case.

The next wave of procurement of sustainable buildings has come from speculative developers of commercial buildings who now appreciate that they do not necessarily require significant additional costs to build, so long as sustainability is considered as an integral part of their procurement from the very outset of

Figure 10.2 The vicious circle of blame (adapted from Cadman 2000 (quoted in Keeping 2000))

the scheme. Sustainable buildings do cost more than their conventional counterparts if sustainable features are retrospectively included in their design or, worse still, their construction.
Speculative developers are now seeing that good returns flow from sustainable buildings and the vicious circle of blame is moving more towards a virtuous circle, as promoted by the RICS and shown in Figure 10.3 below.

**Principal sustainability issues affecting property development**

As has already been discussed, definitions of sustainable development generally refer to the three ‘pillars’ of economy, environment and society. As far as the property industry is concerned rather than, say, the town planning community, there is an almost total focus on environmental concerns rather than the others. Indeed, the terms ‘sustainable’ and ‘environmental’ (and also ‘green’) are used synonymously.

There are many reasons for this but probably the most relevant is that regulatory drivers have pushed developers, investors and their professional advisers in this direction. Another reason is because of media fascination with ‘green’ issues – some call it ‘climate porn’ – often with a view that the planet is going to hell in a handcart unless radical steps are taken to remove us from the mire of environmental degradation. It is, therefore, climate change which most

![Figure 10.3 The virtuous circle (RICS 2008)](image-url)
property people consider when they are asked about sustainability and, in particular, the imperative to reduce the amount of carbon which is emitted as a consequence of buildings being built and used.

New stock and the existing stock

There has also been a fascination within the property industry with consideration of sustainability in the context of ‘green buildings’ and in particular, new green buildings. Much of the discussion within the industry has been about how the procurement of new buildings can do much to reduce the carbon impact of buildings once they are being used because they can be built to very thermally efficient standards, for example. There is a growing awareness, however, that it is in the existing stock that much more needs to be done if carbon emissions are to be reduced because new stock only ever accounts, in the commercial property world for example, for up to a maximum of about 2 per cent of the stock when it is counted on an annual basis (the figure used in this sort of discussion varies).

If the UK more strongly wishes to pursue sustainable development and to make significant reductions in terms of its contribution to climate change, then it will have to invest far more heavily in making its existing stock of buildings more energy-efficient. Because investment finance is limited, this would have to mean that a shift in the balance between new-build and refurbishment of buildings in favour of the latter would have to be made. In turn, this would probably require a much more stringent regulatory environment than we have at present.

The regulatory environment for sustainability

The preceding chapters about the town planning system have shown that it is now and has been for some time fundamentally concerned with delivering sustainable development. We can see that strategic policy, from legislation and PPS1 downwards, considers that planners have a duty to enforce sustainable decision-making on those who wish to develop land and buildings.

Sustainability and development control

Inevitably, therefore, it is at the development control end of the planning system, where developers and planners most often interact, that sustainable property development is keenly considered. Developers are increasingly recognizing that sustainability is an issue which they must have included in their initial thinking about proposed development schemes because their early pre-application discussions with planners and consideration of development plans will confront them with sustainability requirements at the very first step.

In this regard, developers are looking for advice from specialist consultants who can help them to ensure that they have a suitable proposal to discuss with planners that has addressed the necessary range of sustainability issues well before negotiations commence.
Assessing the sustainability of designs for individual new homes and buildings is one thing (and is discussed further below) but discussing sustainability in the round, as development control teams will want to, let alone ensuring that meaningful consideration of relevant matters has been undertaken, is another matter. Some developers and their advisers therefore find it helpful to use sustainability checklists for schemes, certain in the knowledge that development control teams will have their own checklists ready and waiting. One such checklist has been developed by the Building Research Establishment (BRE) (Brownhill and Rao 2002) which provides tools and indicators that measure the sustainability of developments at site or estate level. This publication also enables developers to frame their discussions with local authorities and other stakeholders. Versions of this checklist have been adopted by regional authorities. The South East England Development Agency (SEEDA), for example, has an online version intended to ‘guide the design of new developments by making sense of current policy’ (http://southeast.sustainability-checklist.co.uk/). The checklist enables developers and local authorities to consider whether the following sustainability issues have been considered in development proposals:

**Climate change and energy**

- Flooding
- Heat island
- Water efficiency
- Sustainable energy
- Site infrastructure

**Community**

- Promoting community networks and interaction
- Involvement in decision-making
- Supporting public services, social economy and community structure
- Community management of the development

**Place making**

- Efficient use of land
- Design process
• Form of development
• Open space
• Adaptability
• Inclusive communities
• Crime
• Street lighting/light pollution
• Security lighting

**Buildings**
• EcoHomes/BREEAM or Code for Sustainable Homes

**Transport and movement**
• General policy
• Public transport
• Parking
• Pedestrians and cyclists
• Proximity of local amenities
• Traffic management
• Car club

**Ecology**
• Conservation
• Enhancement of ecology
• Planting

**Resources**
• Appropriate use of land resources
• Environmental impact
• Locally reclaimed materials
• Water resource planning
• Refuse composting
• Noise pollution
• Construction waste

**Business**

• Competitive business
• Business opportunities
• Employment
• Business types.

*Sustainability and building control*

As well as considering sustainability issues in a planning context, developers also need to include such considerations in the context of the Building Regulations.

**Building Regulations**

Part L of the Building Regulations was introduced in 2002 and details how buildings must perform in terms of their thermal efficiency. Minimum values are required to be achieved in terms of the insulation of buildings, measured by way of potential energy loss during their occupation. Part L was revised in April 2006 and legislation, currently in the Climate Change Act 2008, provides for it to be revised at least every five years, with significant energy-efficiency improvements (by a factor of one quarter) being required in each subsequent revision.

Developers need not only to comply with the current Building Regulations but also need to consider the effects of future changes indicated above. If, for example, a building is being designed to meet the requirements of a current set of Building Regulations but will not be completed until after the next revision of Part L, it is possible that it will be released on to the market place at or just before newer buildings which are compliant with the subsequent Regulations and are therefore more energy-efficient. This is likely to have the effect of focusing the minds of developers on ‘future-proofing’ their schemes by ensuring that their designs clearly exceed extant Regulations.
It is also now the case that during certain refurbishments, depending upon the size and cost of the work, part of the expenditure on the works will have to be earmarked to be spent on improving the energy performance of the rest of the building up to current Part L standards. Known as ‘consequential improvements’, this is an attempt by regulators to enforce improvement of the existing stock of buildings in energy-efficiency terms.

Energy Performance of Buildings Regulations

Developers also have to contend with the Energy Performance of Buildings (Certificates and Inspections) (England and Wales) Regulations 2007 and associated Regulations elsewhere in the UK. These were implemented because of the EU Energy Performance of Buildings Directive 2002, which sought both to try to level the European playing field in terms of energy regulations in buildings and also to require each member state to implement rules which would force buildings to become more energy-efficient. As far as developers are concerned, the principal element of the 2007 Regulations is the requirement for newly completed residential and non-residential buildings to have an Energy Performance Certificate (EPC), akin to those which appear on new white goods and cars. The certificates will rate the intrinsic energy performance capability of the building on a scale of A (best) to G (worst), as shown in Figure 10.4 below.

These Regulations will be another factor that developers must consider at the design stage. They would be well advised to consider how investors will respond to EPCs – for example, whether they will have minimum requirements in terms of the energy rating of buildings that they will be prepared to fund and/or purchase.

Commercial sustainability considerations

Much of the discussion above has focused on the regulatory drivers for developers to consider sustainability options in their decision-making. If these were the only drivers, the norm would probably be for many developers to resort to ‘clearing the hurdle’, i.e. just achieving the regulatory minimum. We can see in the marketplace, however, that this is not what is happening in many cases. The reasons for this are that investors and occupiers have demonstrated that they have an interest in procuring sustainable schemes because of the business case which makes them attractive.

Business case factors

In general terms, we can observe the following factors as indicating that sustainable buildings are ‘a good thing’:

• Saving energy: Energy is in short supply, it is expensive and use of non-renewable resources leads to climate change. Sustainable buildings use less of it.

• Attracting people: Companies which occupy green buildings indicate that this is a key factor in recruiting people who share their values.
• Increasing property values: Evidence is building in the USA, UK and elsewhere that certified sustainable buildings are attracting a premium in terms of investment yield. This is partly because demand from occupiers is also increasing, often as a response to companies’ Corporate Social Responsibility policies.

![Sample Energy Performance Certificate](image)

**Figure 10.4 Sample Energy Performance Certificate**

<table>
<thead>
<tr>
<th>Building Energy Performance &gt;</th>
<th>As built:</th>
<th>In use:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Certificate type</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Building Type</td>
<td>FULL</td>
<td></td>
</tr>
<tr>
<td>Whole or part of building</td>
<td>Office</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Whole building</td>
<td></td>
</tr>
</tbody>
</table>

**Very energy efficient**

- A
- B
- C
- D

**Not energy efficient**

- E
- F
- G

<table>
<thead>
<tr>
<th>Asset Rating</th>
<th>Operational Rating</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Cowboys (square metre)</th>
<th>14</th>
<th>12</th>
</tr>
</thead>
<tbody>
<tr>
<td>Equipent heat gain level</td>
<td>12</td>
<td>12</td>
</tr>
<tr>
<td>Weekly occupancy hours</td>
<td>06</td>
<td>08</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Heating performance ratings</th>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
<th>E</th>
<th>F</th>
<th>G</th>
</tr>
</thead>
<tbody>
<tr>
<td>HVAC performance ratings (cooking fans and pumps)</td>
<td>A</td>
<td>B</td>
<td>C</td>
<td>D</td>
<td>E</td>
<td>F</td>
<td>G</td>
</tr>
<tr>
<td>Lighting performance ratings</td>
<td>A</td>
<td>B</td>
<td>C</td>
<td>D</td>
<td>E</td>
<td>F</td>
<td>G</td>
</tr>
<tr>
<td>Management rating (for in-use performance only)</td>
<td>A</td>
<td>B</td>
<td>C</td>
<td>D</td>
<td>E</td>
<td>F</td>
<td>G</td>
</tr>
<tr>
<td>Internal Environmental Quality</td>
<td>Not assessed</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Risk level</td>
<td>Not assessed</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Further Information can be found in the Energy Log Book

**GB 2005**

[Directive 2002/91/EC]
Mitigating risk: Sustainable buildings mitigate various types of risk, including regulatory and obsolescence risk.

Green buildings no longer carry cost premium: As discussed above, it was the case that sustainable buildings were considered to be more expensive to procure than others. As awareness and expertise have increased, however, and as developers consider sustainability at an earlier stage, costs differentials need not appear.

Professional expertise: For some years, universities have been graduating trainee design and construction professionals who are far more aware of sustainability concepts and ideas than previous generations were. These people are now often in decision-making positions and are better able to advise developers and shape their approaches to sustainability than was the case previously.

Pressure from stakeholders

It is worth mentioning that as well as pure financial considerations, of course, developers have to contend with different sorts of pressures coming from a variety of quarters. Figure 10.5 demonstrates who the more common stakeholder groups are, any or all of which could, with different motivations, apply pressure to developers to reconsider their approach to sustainability. Developers increasingly have to be alert to the benefits of stakeholder engagement in all of their operations.

Cost and value issues

The foregoing discussion has referred to attitudes which were, and to an extent still are, predicated on the view that sustainable or green buildings cost significantly more to build than their conventional counterparts. It has also been discussed that if sustainability is retrofitted or ‘bolted on’ to existing designs or buildings then this does add greatly to the overall cost of the amended scheme – but why wouldn’t it? Almost any variations to a building design contract will
Figure 10.5 Examples of stakeholder groups that can exert pressure on developers mean extra cost to the developer, whether the variations mean extra sustainability or not.

The costs of sustainable buildings

In order to determine whether, and if so how much, sustainable buildings do cost more to build, research has been undertaken by the BRE and the Cyril Sweett building consultancy (Building Research Establishment and Cyril Sweett 2005). This research found that there are, understandably, many variables at play in determining costs associated with one scheme or another, but sought to strip out as many variables as possible in order to determine the key issues. The findings were essentially that:

One of the principal barriers to the wider adoption of more sustainable design and construction solutions is the perception that these incur substantial additional costs. A costing analysis, using real cost data for a broad range of sustainability technologies and design solutions, contradicts this assumption. … significant improvements in building sustainability performance can be achieved at very little additional cost. In addition, more sustainable buildings can offer major in-use cost savings.

(BRE and Cyril Sweett 2005)

The research methodology involved assessing the capital costs of each design, management or specification option and comparing them with a ‘Building Regulations compliant’ standard building. In order to make the comparison as realistic as possible, the capital costs analysed include all construction works, as well as preliminary works, overheads, profits and contingencies. Furthermore, the costs were based on design stage implementation rather than retrofitting, and the most cost-effective options were favoured.

The costs of achieving different levels of environmental performance (using BREEAM or EcoHomes standards) were investigated for four different types of building in three different
location types (because BREEAM and EcoHomes standards award credits depending on location):

- a house
- a naturally ventilated office
- an air-conditioned office
- a healthcare centre.

In brief, the results of the research are outlined below in Table 10.1 and Figure 10.6.

The value of sustainable buildings

Of course, the cost implications of procuring sustainable designed buildings need to be seen within the context of their value if developers are to be convinced of merely Table 10.1

Indicative costs of sustainable buildings compared to non-sustainable alternatives (Building Research Establishment and Cyril Sweett 2005)

<table>
<thead>
<tr>
<th>Property type and location</th>
<th>Percentage increase in capital cost to achieve an EcoHomes/BREEAM rating</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Pass</td>
</tr>
<tr>
<td><strong>House</strong></td>
<td></td>
</tr>
<tr>
<td>Poor</td>
<td>0.1</td>
</tr>
<tr>
<td>Typical</td>
<td>0</td>
</tr>
<tr>
<td>Good</td>
<td>0</td>
</tr>
<tr>
<td><strong>Naturally ventilated office</strong></td>
<td></td>
</tr>
<tr>
<td>Poor</td>
<td>–0.4</td>
</tr>
<tr>
<td>Typical</td>
<td>–</td>
</tr>
<tr>
<td>Good</td>
<td>–</td>
</tr>
<tr>
<td><strong>Air-conditioned office</strong></td>
<td></td>
</tr>
<tr>
<td>Poor</td>
<td>0</td>
</tr>
<tr>
<td>Typical</td>
<td>–</td>
</tr>
<tr>
<td>Good</td>
<td>–</td>
</tr>
<tr>
<td><strong>PFI Healthcare centre</strong></td>
<td></td>
</tr>
<tr>
<td>Typical</td>
<td>–</td>
</tr>
<tr>
<td>Good</td>
<td>–</td>
</tr>
</tbody>
</table>
Figure 10.6 Indicative costs implications of attaining different levels of BREEAM ratings (Building Research Establishment and Cyril Sweett 2005)

clearing the regulatory minimum by complying with extant Building regulations and the requirements of local planning authorities. Assessing the value of sustainable buildings is not easy – certainly not as ‘easy’ as defining what they cost to build – because valuation, whilst not exactly a black art, often involves a certain amount of subjectivity and manipulation of data to suit individual circumstances.

Another problem associated with assessing the value of sustainable buildings is the paucity of transaction data. This will improve with time, but at present and in the short-term this situation will confound those trying to prove a link between sustainability and value in buildings. In 2008, a pan-European network of RICS members began to consider how the issue of data collection could be addressed, and their findings are awaited with interest.

In the meantime, it is useful to consider the general drivers of value in buildings and how sustainability features might either add to a building’s value or detract from it. Research undertaken on behalf of the RICS (RICS 2005) attempted to establish the link between sustainability features of buildings and their value. This research, which looked at buildings in North America and the UK, showed that in their case studies there was a relationship between the market value of a building and its sustainability features (as shown in Table 10.2 below), i.e. that they can:

- command higher rents and prices
- attract tenants more quickly
• reduce tenant turnover

• cost less to operate and maintain.

Although relatively few case studies were investigated, it is important to note that the research also concluded that the main benefits of sustainable buildings are achieved by occupiers and that chief amongst these, i.e. where there is the biggest return on investment, is probably in increased employee productivity (given that labour costs are by far and away the major cost to a business).

A common theme which is revisited at intervals in later chapters of this book is that developers need increasingly to understand and respond better to the needs of occupiers if they are to offer products which really suit occupational needs. This situation applies in relation to the sustainable features of buildings as much as any other.

It is not just occupiers’ requirements that developers need to satisfy, however. Investors’ and regulators’ demands and wishes also need to be heeded and, as the above discussion suggests, it is increasingly clear that all three of these most important stakeholders are increasingly requiring attention be paid to the procurement of sustainable buildings.

**Practical issues for developers**

As has been discussed above, it is beyond the scope of this book, or indeed any book, to provide a highly detailed discussion and explanation of every aspect of

*Table 10.2 Possible linkages between sustainable building features and building value (RICS 2005)*

<table>
<thead>
<tr>
<th>Green objectives</th>
<th>Green strategies/features</th>
<th>Green impact</th>
<th>Theoretical linkage to value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sustainable site development</td>
<td>Reduce site disturbance and soil erosion during construction</td>
<td>Improved site aesthetics</td>
<td>Reduced development costs, improved marketability, reduced ongoing maintenance costs, improved natural appearance, higher sales/rents, absorption and re-tenanting, NOI*/ROI** benefits.</td>
</tr>
<tr>
<td></td>
<td>Use of natural drainage systems (e.g. swales)</td>
<td>Greater public support for the development and accelerated local approval process, hence lower carrying costs</td>
<td>For gross leases, higher NOI.</td>
</tr>
<tr>
<td></td>
<td>Preserve or restore natural site features</td>
<td>Lower energy costs</td>
<td>May have impact for net leases *** if benefit can be demonstrated to tenants</td>
</tr>
<tr>
<td></td>
<td>Landscape and orient building to capitalize on passive heating and cooling</td>
<td>Lower water</td>
<td>Lower tenant CAM****</td>
</tr>
<tr>
<td>Water</td>
<td>Use captured rainwater</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

• For gross leases, higher NOI.

• May have impact for net leases *** if benefit can be demonstrated to tenants

• Lower tenant CAM****
<table>
<thead>
<tr>
<th>Green objectives</th>
<th>Green strategies/features</th>
<th>Green impact</th>
<th>Theoretical linkage to value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Energy efficiency</td>
<td>Use energy-management systems, monitoring, and controls to continuously calibrate, adjust, and maintain energy-related systems</td>
<td>Lower capital costs</td>
<td>Lower operating costs. On gross leases, higher ROI/NOI</td>
</tr>
<tr>
<td></td>
<td>Use third-party commissioning agent to ensure that the installed</td>
<td>Lower energy costs</td>
<td>On net leases, potential for improved ROI/NOI</td>
</tr>
<tr>
<td></td>
<td>systems</td>
<td>Occupant benefits</td>
<td>Marginally higher initial soft costs should be offset by long-term operating cost benefits, higher ROI</td>
</tr>
<tr>
<td></td>
<td>• Treat and reuse greywater, excess ground water and steam condensate</td>
<td>• Use passive solar heating/cooling and natural ventilation</td>
<td>• Improved occupant productivity, lower churn, turnover, tenant inducements, etc.</td>
</tr>
<tr>
<td></td>
<td>• Use low-flow fixtures and fittings (pressure-assisted or composting toilets, waterless urinals, etc.) and ozonation for laundry</td>
<td>• Enhance penetration of daylight to interior spaces to reduce need for artificial lighting</td>
<td>• Higher net income for gross leased buildings, improved yield.</td>
</tr>
<tr>
<td></td>
<td>• Use closed-loop systems and other water-reduction technologies for processes</td>
<td>• Use thermally efficient envelope to reduce perimeter heating and size of HVAC</td>
<td>• Lower operating costs. On gross leases, higher ROI/NOI</td>
</tr>
<tr>
<td></td>
<td>• Use energy-management systems, monitoring, and controls to continuously calibrate, adjust, and maintain energy-related systems</td>
<td>• Operational savings (can offset higher capital costs)</td>
<td>• On net leases, potential for improved ROI/NOI</td>
</tr>
<tr>
<td></td>
<td>• Use third-party commissioning agent to ensure that the installed systems</td>
<td>• Reduced capital cost of mechanical systems because control systems reduce the need for over-sizing</td>
<td>• Marginally higher initial soft costs should be offset by long-term operating cost benefits, higher ROI</td>
</tr>
<tr>
<td></td>
<td>for landscaping, toilet flushing, etc.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Indoor environmental quality</td>
<td>Reduced consumption of building materials</td>
<td></td>
<td></td>
</tr>
<tr>
<td>------------------------------</td>
<td>--------------------------------------------</td>
<td></td>
<td></td>
</tr>
<tr>
<td>systems work as designed</td>
<td>Select products for durability</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Develop O&amp;M manuals and train staff</td>
<td>• Eliminate unnecessary finishes and other products</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Control pollutant sources</td>
<td>• Reuse building shell from existing buildings and fixtures from demolished buildings</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Use low-emission materials</td>
<td>• Design for adaptability</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Ventilate before occupancy</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Enhance penetration of daylight and reduce glare</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Superior indoor air quality, quality lighting and thermal quality</td>
<td>• Longer building lifecycle</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Fewer occupant complaints</td>
<td>• Lower maintenance costs.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Higher occupant productivity.</td>
<td>• Lower maintenance costs.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Risk reduction</td>
<td>• Lower depreciation typically after higher investment costs</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Greater marketability</td>
<td>• Lower construction costs, probable lower operating/maintenance costs, higher ROI/NOI</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Faster sales and lets</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Improved churn/turnover</td>
<td></td>
<td></td>
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<tr>
<td>• Higher ROI/NOI</td>
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</tbody>
</table>

**Notes**

* NOI: net operating income

** ROI: return on investment

*** Net lease: a lease that requires a lessee to pay all their operating costs resulting from their occupation of the premises

**** CAM: common area maintenance
Table 10.3 Sustainability considerations at key stages in the development process (adapted from Building Research Establishment and Cyril Sweett 2005)

<table>
<thead>
<tr>
<th>Feasibility</th>
<th>Planning and design</th>
<th>Construction</th>
<th>Occupation</th>
<th>Demolition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ecologist</td>
<td>Sustainability adviser</td>
<td>Commissioning</td>
<td>Environmental policies</td>
<td>Reclamation of materials</td>
</tr>
<tr>
<td>Environmental consultant</td>
<td>Building form</td>
<td>Considerate Constructors Scheme</td>
<td>Monitor energy</td>
<td>Recycling</td>
</tr>
<tr>
<td>Renewables</td>
<td>Cycle storage</td>
<td>Minimize waste</td>
<td>Monitor water</td>
<td>Reduce impact of redundant materials</td>
</tr>
<tr>
<td>Location</td>
<td>Material specifications</td>
<td>Off-site construction</td>
<td>Maintenance</td>
<td></td>
</tr>
<tr>
<td>BREEAM target</td>
<td>Orientation</td>
<td>Use of local suppliers</td>
<td>Occupant satisfaction</td>
<td></td>
</tr>
<tr>
<td>Site conditions</td>
<td>Services Waste</td>
<td>Waste</td>
<td>Recycling</td>
<td>Transport policies</td>
</tr>
</tbody>
</table>

sustainability in every aspect of the property development process. The purpose of this next section is to give an overview of some of the practicalities with which developers have to contend when they are assuming a sustainable approach to their work.

Earlier in this chapter, sustainability checklists were considered in terms of enabling developers and others to ensure that they had considered sustainability ‘in the round’ and were able to frame discussion with stakeholders on the basis of compliance or otherwise with checklist criteria. Table 10.3 above provides another set of criteria which is much more general than those discussed above but does provide a quick view of the key practical issues that developers will need to consider.

**Key issues: Location, design, construction**

If developers are to deliver a more sustainable development than would otherwise be the case, they would be well advised to think about the three key issues of location, design and construction. In this regard, several factors need to be considered.

**Location**

Given that about one-third of carbon emissions in the UK are generated by vehicles, i.e. more than homes or the non-domestic property sector, designing and locating buildings which reduce the need to travel would make a significant contribution to the country’s attempts to reduce its impact on climate change – probably far more than tinkering with buildings’ thermal efficiency, for example.
There are many factors to consider here, including the in-town and out-of-town debate (which is discussed in previous and subsequent chapters), investment in public transport networks and even investment in technological changes to the engines and use of fuels in vehicles, which are within developers’ control. It is certainly the case that developers can decide whether or not they will build homes a long way from places of work and amenities (and vice versa). It is also true that developers can decide whether or not they will invest in public transport networks (and sometimes they do not have any option to do otherwise). It is even true that developers can invest in technologies within vehicles which have a lower environmental impact, such as through green travel plans.

Design

The necessity to improve the condition of the existing property stock through sustainable refurbishment has been discussed above, but whether or not it is refurbishments or new-builds that are being considered, the next most important thing, after sorting out transport-related environmental impact, is to consider the sustainable design of the buildings themselves.

In this respect, designers should these days be deeply familiar with the concept of sustainability and how best to achieve it. If they are not, they are probably not worth engaging. Advice is certainly necessary from designers on this aspect of developers’ requirements and reference to suitable design tools will be essential.

An essential item in every designer’s toolkit these days should be The Green Guide to Specification (Anderson and Shiers 2008), which provides guidance for specifiers, designers and developers on the relative environmental impacts of over 250 elemental specifications for building components, such as roofs, walls and floors. Use of this tool will enable designers to compare the environmental and cost profiles of these components and thus demonstrate more precisely to what degree they are engaging with sustainability.

Having designed a scheme which is constituted by sustainable components and is in a sustainable location, developers would be advised to ensure that their building is assessed and ‘badged’ as being sustainable in order that potential occupiers and investors will be aware of this (i.e. to achieve marketing advantage) and that other stakeholders, such as the press, local authority and shareholders are also aware of this (i.e. to achieve public relations advantages).

In the UK, the best means of assessing and badging buildings comes in the form of Building Research Establishment Environmental Assessment Method (BREEAM), of which there are versions for different buildings types, including the Code for Sustainable Homes and BREEAM Retail, Offices and Industrial specifications. All versions examine the same environmental impacts:

• Management

• Health and well-being

• Energy
• Transport
• Water
• Material and waste
• Land use and ecology
• Pollution.

Credits are awarded in each of these areas according to performance, and an overall score is awarded in a certificate, which rates the building on a scale of:

Pass; Good; Very Good; Excellent; Outstanding.

The benefits of achieving a BREEAM rating to developers are listed to include:

• Enhanced marketability
  – Recognized brand associated with quality buildings and organizations with active corporate social responsibility agendas
  – Represents a low-risk investment choice
• Increased flexibility
  – Reduced letting voids
  – Increased investment security
• Good return on investment
  – Desirable buildings give a high rate of return and a low void rate.

(Source: www.breeam.org)

Construction

The UK construction industry is a wasteful one. It is responsible for about half of UK landfill waste and 13 per cent of all raw materials use (BERR 2007). This situation has not gone unnoticed by regulators, and the government intends that the following targets will be achieved to rectify it:

• By 2012, a 50 per cent reduction of construction, demolition and excavation waste to landfill, compared to 2005
• By 2015, zero net waste, at construction site level

• By 2020, zero waste to landfill (BERR 2007).

Various pieces of guidance are available for developers and their contractors to use in managing construction waste. WRAP (www.wrap.org) is a company which has been established to encourage and enable businesses to be more efficient in using materials and recycling. Its work in the construction sector has enabled it to provide practice guides and technical manuals for waste minimization and management.

The key benefits of having effective Site Waste Management Plans are that they not only enable developers and contractors to comply with legislation but can also realize benefits, which include:

• Cost savings through reduced requirement for materials, disposal costs and sale of materials

• Demonstration of good environmental performance and corporate social responsibility

• Reduced impact on the local community and better public relationships

• Improved company performance, allowing differentiation from competitors (www.wrap.org).

Developers, as clients of the construction industry, have a real opportunity to ensure that construction waste is reduced. They would be well advised to insist upon effective Site Waste Management Plans being used and that conditions are included with construction contracts to enable this.

Key issues for property sectors

Much of the foregoing discussion relates to every property type. All sectors of the property industry are affected by sustainability, and developers in all of these sectors need to be alert both to the regulatory situation pertinent to sustainability in their sector and to the different opportunities flowing from sustainability that exist within them. This section focuses on some of the key issues and emerging trends that are relevant to the sectors of the property industry which are considered later on in this book.

Retail

It is in the retail sector of the economy that most regard has been had to sustainability. This is partly because shareholders of large companies are demanding change and expect retailers (and others) to have strong Corporate Social Responsibility (CSR) credentials which translate into their business decision-making. It is also the case that regulatory change has had a part to play in this but the overwhelming reason is a more direct business driver – changing consumer attitudes. Evidence of this comes from the government’s Survey of Public Attitudes and Behaviours toward the Environment (DEFRA 2007), which found that it is a ‘socially acceptable norm’ to be ‘green’. Importantly, the survey also identified the extent to which customers are assessing
businesses based on their environmental performance. Half of interviewees try not to buy products from companies performing badly in environmental terms and nearly half would be prepared to pay a premium for ‘green’ products. The retail world is extremely competitive, and margins are often tight. Retailers can use sustainability strategies as marketing tools to help them to win customer share.

Perhaps it is for these reasons alone that the country’s largest retailers have bought into the sustainability agenda (and particularly the climate change agenda) and realize that their properties need to reflect their green aspirations. Others might argue that retailers are making genuine attempts to address climate change because it needs to be addressed. In a speech in January 2007, the Chief Executive of the UK’s largest retailer spoke about climate change:

I am determined that Tesco should be a leader in helping to create a low-carbon economy. In saying this, I do not underestimate the task. It is to take an economy where human comfort, activity and growth are inextricably linked with emitting carbon and to transform it into one which can only thrive without depending on carbon. This is a monumental challenge. It requires a revolution in technology and a revolution in thinking.

(Leahy 2007)

Given that retailers have adopted certain themes as the environmental issues that they must address, energy use being chief amongst them, developers need to understand the role that they can play in providing retailers with a means of reducing their carbon footprints. In this respect, it is again location and the fact that many stores require (and encourage) visits by car which is probably the chief issue that retailers need to address. Furthermore, they need to address the logistical infrastructure which keeps them supplied with goods and where stores are located in relation to warehouses and depots. Independent developers, whilst they can assist in site finding and procuring facilities in locations which have lower carbon impacts, have relatively little to do in retailers’ locational decision-making. Where they can make a difference is in the design and construction of the buildings themselves.

If developers need convincing of major retailers’ positive intentions in this regard, then it is worth considering how the major food retailers are behaving in terms of managing their carbon impact. The following three examples provide just some of the evidence (Keeping 2008):

- Tesco has committed itself to reducing its carbon impact by 50 per cent by 2020 in its stores and distribution centres.

- Sainsbury has (since 2001) a commitment to reduce carbon levels by 10 per cent. By managing this aspect of the business, Sainsbury has realized over £8 million worth of savings.

- ASDA has focused upon designing a viable prototype store that is considered to be between 25 and 30 per cent more energy-efficient than ‘usual’ stores and subsequently has 30 per cent fewer greenhouse gas emissions.
Offices

According to market opinion, of the costs associated with procuring and operating a commercial building over a twenty-five year lifespan, about 2 per cent is spent on construction, about 6 per cent on operation (rent, maintenance, taxes, etc.) and 92 per cent on staff wages. In terms of how occupiers of these buildings think, therefore, uppermost in their minds is not the rent or the energy bills but the effect of the building upon the productivity of employees. As an area of research, employee productivity has been studied for some time, and work was particularly active from the 1950s onwards. However, measuring the effect of building design and specification on employee productivity is relatively new. For proponents of sustainability, this is somewhat of a ‘holy grail’ because it is felt that if the anecdotal evidence that sustainable buildings boost the performance of employees can be proved much more broadly to be true, procurement of sustainable buildings is likely to become another standard requirement for companies.

Often the anecdotal evidence is, while limited, compelling. Much of it originates from the USA. For example, at communications company Verifone’s offices in Costa Mesa, California, an energy-efficient design which derived 50 per cent energy savings through use of daylighting and natural cooling also meant that absenteeism dropped by 40 per cent and productivity increased by 5 per cent due to improved comfort. The return on investment of the additional costs associated with this scheme meant that it was paid back within one year (Romm 1999). As stated previously, there is a growing body of this sort of anecdotal evidence, but more empirical work needs to be done to identify which elements of sustainable design result in what sort of employer benefits.

Advice as to how to approach sustainable office design is varied, both in terms of scope and quality. Other than the excellent Green Guide to Specification (Anderson and Shiers 2008), a useful guide for those beginning to think about refurbishing and fitting out office space, which works well for those specifying new build schemes as well, has been produced by the Ministry for the Environment in New Zealand (Ministry for the Environment 2005), which comments that:

The definition of sustainability as applied to buildings is not fixed, but ‘green’ or sustainable buildings are sensitive to:

• the environment – local and global

• resource, water and energy consumption

• the quality of the work environment – impact on occupants

• financial impact – cost-effective from a long-term, full financial cost-return point of view

• long-term energy-efficiency over the life of the building.

When looking at what’s involved with refurbishing or fitting-out a building, this could mean:
• using resources efficiently – getting more from less
• minimizing waste
• focusing on energy and water use
• choosing products carefully to ensure they are not harmful to the environment or to occupants’ health.

The main other issue which the developers of office premises need to consider is, yet again, that of location and transport. Out-of-town business parks are carbon intensive, given that they have high car parking ratios and often have limited public transport provision. Given the direction in which transport policy is going, it seems that the days of large new out-of-town business park developments are numbered. Furthermore, it is likely that achieving BREEAM ratings of ‘Excellent’ will become difficult, and ‘Outstanding’ nigh on impossible for buildings in such locations in the near future. This will have consequences in terms of occupier preference.

It has been interesting to see a number of speculative office development schemes being undertaken in recent years which have achieved ‘Excellent’ BREEAM ratings. Notable schemes which stand out include those at:

• Merchant Square and Kingdom Street in Paddington, London
• Calthorpe House and 11 Brindleyplace in Birmingham
• Temple Back and The Paragon, Bristol
• Lattitude in Leeds
• 3 Hardman Street and Piccadilly Place, Manchester
• Interpoint at Haymarket in Edinburgh.

The reasons behind this sudden rash of speculative BREEAM ‘Excellent’ buildings have undoubtedly included a shift in the attitudes of large corporate occupiers. PricewaterhouseCoopers (PwC), for example, which is one of the largest office occupiers in the all-important financial and business services sector in the UK, states in its environmental policy that it will:

Give due consideration to environmental issues in the acquisition, design and location of buildings, and apply BREEAM standards for building specifications, features and construction wherever possible

(PwC 2005)
Furthermore, in their Corporate Responsibility report, PwC says that:

For the buildings we occupy, we always aim to site them in locations easily accessible by public transport. We also insist on buildings with a good environmental performance – for our new London building architects BDP produced a sustainability specification which means that this building will meet the highest BREEAM standard of ‘excellent’, as must any new building we specify. Refurbished buildings will be brought up to the next best rating of ‘very good’.

(PwC 2007) (http://www.pwc.co.uk/eng/aboutus/corporate_responsibility_environment.html)

Developers need to think about changing occupiers’ attitudes and monitor them carefully. The BREEAM ‘Excellent’ schemes noted above all came to the market quickly, helped by the investment boom of the mid-2000s, which shows how quickly the property juggernaut can actually respond to trends and demand.

*Industrial*

Logistics operators, whether third party providers or in-house operations for retailers or other businesses, undertake to provide their clients with a service which is nearly wholly reliant upon road transport. By their very nature, therefore, they have a large carbon footprint. In order to reduce this significantly, they could switch to alternative forms of transport, such as rail or even canal. However, the capacity of these systems is considered insufficient to meet the needs of modern businesses which generally require more rapid and flexible movement of goods, although some goods do travel by such routes (rail freight interchanges are discussed in Chapter 18 on industrial property development).

Otherwise, developer can assist logistics operators to reduce the carbon intensity of their operations by providing facilities which are designed to reduce energy use (and make other environmental savings).

In terms of the means by which the design of logistics facilities can contribute to reducing environmental impact, both Prologis and Gazeley have produced buildings which are market leaders. Gazeley’s ‘EcoTemplate’, for example, includes:

- Local provenance vegetation
- Wall vegetation
- Pervious paving
- Pre-cast concrete dock faces
- 15 per cent rooflights
- Recycled and rapidly renewable finishes to office
• Photovoltaic panels
• Wind turbine
• Solar thermal hot water system
• Roof water collection
• Low flush volume products in WC area.

Further discussion and examples of sustainable industrial development are provided in Chapter 18 on industrial property.

Residential

In as far as making significant contributions to reducing carbon emissions and thus to the causes of climate change, it is undoubtedly the case that it is the residential sector to which most attention ought to be paid. Figure 10.7 shows why this is the case.

In considering the data evident in Figure 10.7, one might not unreasonably wonder why governments pay so much attention to the commercial property world’s contribution to climate change relative to that of the domestic sector. It might be that it is politically expedient to make businesses address climate change reduction measures rather than the voting public. Nonetheless, governmental attention has been focused on the domestic sectors and to residential...
property development in particular (again, one might wonder why more attention is not paid to the existing stock rather than new-build).

It is undoubtedly regulatory drivers that are pushing progress in terms of sustainable residential property development rather than purchase or occupier demand. In the private sector, dominated by owner-occupiers, demand for sustainable properties is limited. In the social housing sector, there is more demand for sustainable housing from Registered Social Landlords (RSLs), but this is largely driven by demands from public funding bodies (i.e. Communities England, Communities Scotland, etc.).

Recent changes in the regulatory landscape for and the mainstreaming of sustainable residential property were largely prompted by the ‘One Million Sustainable Homes’ campaign led by WWF. The campaign was supported by regulators, government agencies and private sector developers and its most significant result was the driving through of the Code for Sustainable Homes as the
standard against which the sustainability of residential schemes should be measured. This has replaced EcoHomes and is likely to develop further.

The Code for Sustainable Homes measures the sustainability of new homes against categories of sustainable design, rating the whole home as a complete package. The Code uses a 1-star to 6-star rating system to communicate the overall sustainability performance of new homes, setting minimum standards for energy and water use at each level (Department for Communities and Local Government 2007b). Level 6 of the Code requires homes to be ‘carbon zero’, a decision which was contentious after it was announced, partly because definitions of ‘carbon zero’ are many and various, but chiefly because it required buildings to rely upon on-site renewable energy technologies. It is suggested by policy that all new homes will be ‘carbon zero’ by 2016. All new homes require measurement against the Code, as of May 2008.

The theory behind compulsion to have on-site renewable technologies for residential schemes is not without some merit – it is efficient if generated power is not lost during transmission – but fails to account for the expensiveness of it and the limited scope of developers to afford it. The mathematics are quite straightforward. If costs increase in a scheme, developers have either to increase revenue (by putting up house prices) or to decrease other costs. The former option is not really possible, developers say (with justification) because purchasers will not bear the extra cost – house prices have been way too high for many to afford for many years. The latter option, to reduce costs, is only really possible in two ways – by reducing profit margins or by paying less for the land (other costs, like building construction, fees and finance are largely fixed by others, and the first two tend to inflate over time, rather than reduce).

The economic circumstances of residential property developers and the property market of the 2000s was certainly a ‘game of two halves’ and one which demonstrates that neither increasing sales prices nor reducing profit margins really works in this respect. The boom experienced by developers up until 2007 occurred because house prices were increasing steeply – adding to these prices with expensive on-site technologies would not have been in purchasers’ interests (and thus not in developers’ interests). The market turned quickly and, by 2008, many developers were struggling to survive (some did not even manage this), with profit margins non-existent because house prices were falling. At the same time, land prices were falling as well (as some developers put it at the time ‘through the floor … and the basement’). Thus even suggesting a reduction on land prices encouraged land owners to sit back and wait for the market to change.

The result of the requirement to have on-site renewable energy technologies is, developers say, that though they are willing to provide them, they cannot do so without making losses on schemes, which of course they are not prepared to do. It is likely, therefore that one or both of two situations will occur. First, it will be up to public sector agencies to provide land at no or little cost for zero carbon schemes. Whilst this might suit Communities England and sister bodies elsewhere in the UK for this to occur, it is doubtful if the likes of the Ministry of Defence or NHS Trusts disposing of surplus land to meet Treasury revenue guidelines will be so keen. The other situation, of course, is that the policy changes and off-site renewable energy technologies are allowable within the definition of ‘zero carbon’. This would seem a sensible situation – but that does not necessarily mean that regulators will adopt it. Developers would be well advised to
keep engaging with regulators to ensure that the regulatory environment allows for sustainable homes to be developed.

Conclusions

Sustainable development is an issue which has rapidly come to affect property development and will continue to do so over the foreseeable future. No developers worth their salt have ignored this and those who have invested in it and engaged successfully with various stakeholders, such as Hammerson, Gazeley and Crest Nicholson, have quickly consolidated their reputations as recognized market leaders. These and other developers have recognized that early engagement with the raft of issues which are encompassed within sustainable property development leads to profitable returns. In the commercial and industrial property worlds, developers must recognize and respond to the fast-moving and constantly changing requirements of occupiers, for it is these stakeholders who are driving change most significantly there. In the residential property sector, drivers are most significant in the regulatory context, and understanding the Code for Sustainable Homes and influencing how it might develop will be important to all developers.

For all property developers, whichever sector they are operating in, deciding early on in schemes how sustainability issues will be addressed is absolutely vital. Bringing in such considerations too late in the day will delay schemes because development control officers will insist on schemes being rethought and will also mean that schemes become more expensive as designs are revised and money is borrowed for a longer scheme. Table 10.4 sets out how different sustainability issues can be considered at the conceptual stage of a development scheme and for every potential phase of the scheme.

Looking to the future, developers will need to get better at anticipating regulatory change, in order to ‘future-proof’ their schemes and thus make them attractive to occupiers and investors. The pace of change in terms of stakeholders’ expectations is significant, as it is as far as regulations are concerned. The Code for Sustainable Homes was first introduced in 2006 and was made a mandatory requirement in 2008 for the assessment of energy and water performance in domestic buildings. Commercial property developers would do well to ensure that a stand-off similar to the one that occurred between government and residential property developers does not happen in their sector regarding on-site renewable technologies.

All developers should also realize that if sustainable development policy moves in a direction which seeks to increase sustainability significantly, then the development of new schemes is likely to get more expensive compared to the refurbishment of existing buildings. Furthermore, the development of certain types of buildings, like ‘glass box’ office buildings, will become very difficult because of their environmental inefficiency.

Developers will need increasingly to ensure that they are not promoting the ‘vicious circle of blame’ but are a component of its ‘virtuous’ counterpart. If they do not, regulators will come down hard, heavy and hastily upon them.
Table 10.4 Property lifecycle sustainability issues (John Lewis Partnership 2007)

<table>
<thead>
<tr>
<th>Phase</th>
<th>Definition of phase</th>
<th>Key issues to be considered</th>
</tr>
</thead>
<tbody>
<tr>
<td>Strategic business need</td>
<td><em>Do we need the building?</em></td>
<td>• Integrate sustainability issues into decision making</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Explore service delivery models</td>
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<tr>
<td></td>
<td></td>
<td>• Assess options rigorously</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Assess wider local community needs and possibility of buildings fulfilling some of these</td>
</tr>
<tr>
<td>Feasibility of project</td>
<td><em>Can we build it?</em></td>
<td>• Influence prospective business partners</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Integrate sustainability criteria into procurement strategy and selection criteria</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Provide clear statement of intent</td>
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<tr>
<td></td>
<td></td>
<td>• Develop sustainability objectives and targets for project (Sustainability Action Plan)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Consider fiscal incentives for developer/contractor to achieve high sustainability performance</td>
</tr>
<tr>
<td>Planning and design</td>
<td><em>What will it look like?</em></td>
<td>• Consider whole-life value and social and environmental issues within design</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Consult with key stakeholders, including local community, chambers of commerce, local training organizations, etc.</td>
</tr>
<tr>
<td>Construction</td>
<td><em>How should we build it?</em></td>
<td>• Include clear sustainability selection criteria for selecting materials and products</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Include sustainability performance and whole-life considerations in selection criteria for subcontractors and suppliers respectively</td>
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<tr>
<td></td>
<td></td>
<td>• Implement site management procedures</td>
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<tr>
<td>Operation and maintenance</td>
<td>How should we use it?</td>
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<td>----------------------------</td>
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<td></td>
</tr>
<tr>
<td>• Monitor performance</td>
<td>on key issues such as waste and health and safety</td>
<td></td>
</tr>
<tr>
<td>• Hand over to building users</td>
<td>• Monitor and report against sustainability targets</td>
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<tr>
<td>How should we use it?</td>
<td>• Be a good neighbour</td>
<td></td>
</tr>
<tr>
<td>• Incorporate in facilities management</td>
<td>• Monitor and audit performance</td>
<td></td>
</tr>
<tr>
<td>• Carry out post-occupancy evaluation</td>
<td>• Feed back results and transfer knowledge across estate</td>
<td></td>
</tr>
<tr>
<td>• Consider end-of-life options</td>
<td>• Conduct a detailed post-occupancy evaluation within the first year of use and at regular intervals thereafter</td>
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</tbody>
</table>