

# Sustainable cities

A vision of our future landscape



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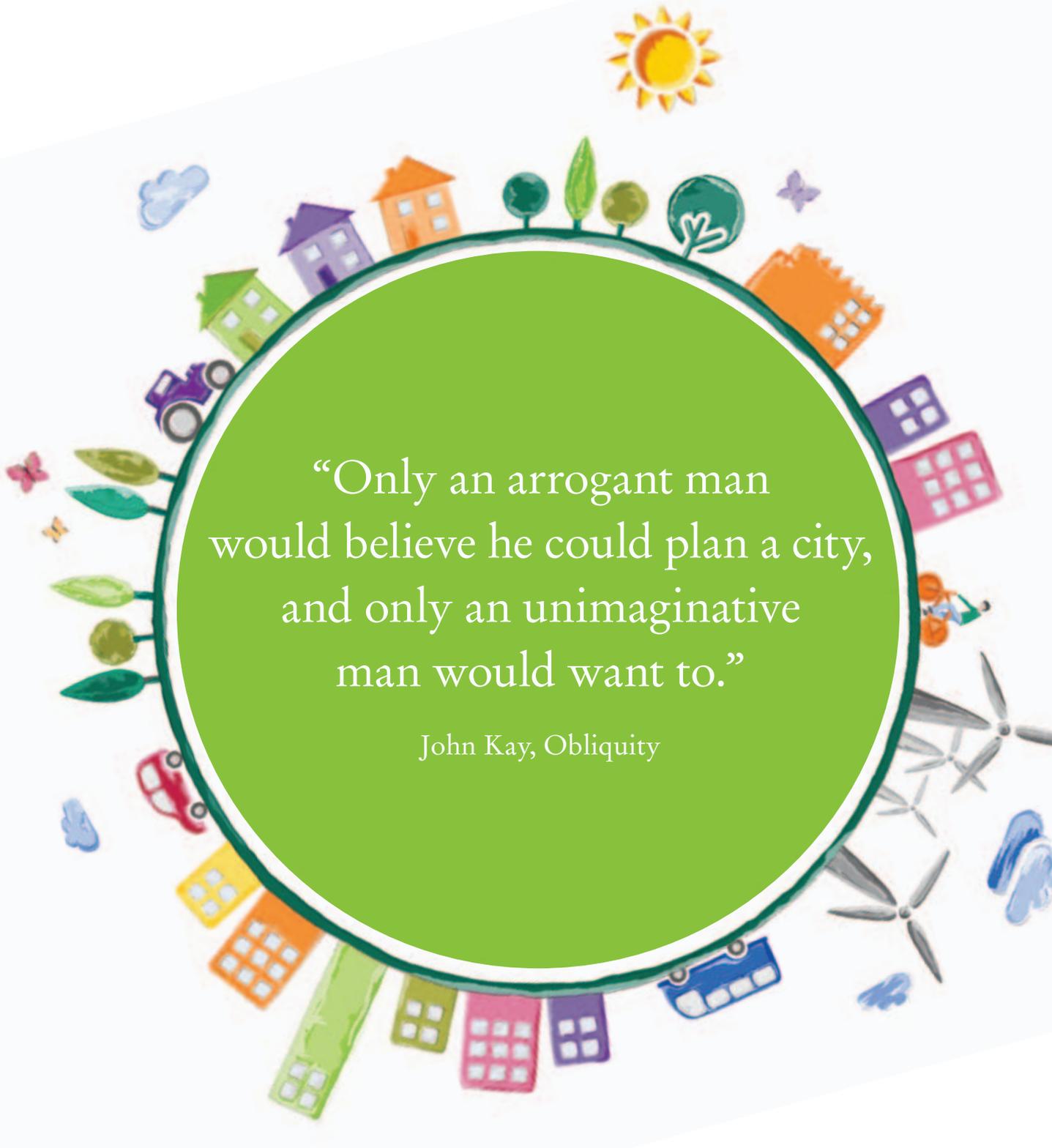
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A circular graphic with a green center and a white border, surrounded by colorful icons of a city, nature, and sustainable energy. The icons include a sun, houses, trees, a tractor, a car, a bus, wind turbines, and butterflies.

“Only an arrogant man  
would believe he could plan a city,  
and only an unimaginative  
man would want to.”

John Kay, *Obliquity*

# Executive summary

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UK cities are at a crossroads in their development. Faced with the triple challenges of sustainable economic growth, more efficient use of resources and addressing climate change, they are having to rethink how they plan and invest for the future.

Cities are crucial to global sustainability. We are past the tipping point where more people live in cities globally than don't, and the rate of urbanisation is accelerating. In fact, given current global population estimates, a planet of cities is probably the only sustainable long-term option.

Businesses are on a parallel path as they address their challenges of changing consumer demands, managing supply chains more efficiently and addressing the impact they have on the environment.

Throughout the public, private and third sectors, organisations are now drawing the link between the sustainability of the environments within which they operate and their own sustainability.

This report looks at what UK cities are doing to address the sustainability challenge, and sets it in the perspective of a rapidly evolving global and national context.

It is not intended to be a comprehensive review of sustainable development in the UK – this would require many volumes. The report makes a cross-section of sustainable

developments, and makes recommendations around areas that need to be addressed to achieve effective commercial implementation, and to outline our vision of what the future might look like.

The conclusions in a way are obvious: greater and 'smarter' collaboration and partnership between the public and private sectors and between the cities themselves will be critical to successfully addressing this challenge. Isolated initiatives which 'reinvent the wheel' and fail to draw on the full spectrum of skills and resources available will be wasteful of resources and will fall short of objectives.

We start by going back to basics and asking what sustainability really means. There are four recognised 'pillars' of sustainability: environmental, economic, social and institutional. The institutional pillar is particularly relevant to the development of sustainable UK cities, given the recent legacy of fragmentation in business and public structures in this country. The coalition's Localism Bill, together with the creation of Local Enterprise

Partnerships (LEPs), signals more evolution and potential fragmentation of institutional structures, which will further modify the landscape.

UK cities are adopting different points of departure as they develop their sustainability strategies, to allow what they see as key priorities or to secure early wins.

Policy and strategies don't, however, operate in a vacuum. The key variable is the human response – whether from individuals, communities, businesses or other organisations. People are bombarded with a wide array of sustainability resources in all kinds of media, which will 'press the buttons' with varying degrees of effectiveness.



We have identified four key elements in getting the sustainability message across:

- Incentive • Challenge
- Reassurance
- Timing

Getting the balance right amid a mix of often conflicting messages is a big challenge, especially as loss of credibility can be highly damaging. Transparency and honesty will be critical success factors for city sustainability strategies. It will also be interesting to see how important and effective ‘nudges’ can be in changing behaviour.

With business starting to take sustainability seriously, not only is there a commercial opportunity in implementing city sustainability strategies, but also a ‘read-across’ in terms of public and private sector strategies. The key question

is how to find effective models of engagement that will meet the objectives of both public and private stakeholders.

This feels like something completely new, but it isn’t. There are parallels with some of the challenges faced in the nineteenth century as city authorities struggled to put in place infrastructure that we now take for granted.



The task at hand now is to start to create delivery structures and implement programmes – drawing on the experience and resources of the private sector.

There have been a number of supply-side policy developments recently (such as feed-in tariffs) which create real opportunities for cities, bring national policy (particularly in the energy arena), more closely into alignment with the needs of cities and potentially allow city authorities greater strategic freedom. However, funding sources remain uncertain: the Green Investment Bank is still under development and looks as though it may focus on large centralised infrastructure. European funding and policy on sustainable cities are out of alignment. That said, there are also opportunities, and UK cities are looking closely for example at the JESSICA and ELENA funding mechanisms.

The development of green supply chains by businesses offers a range of interesting comparators for UK cities which are already tuned in to the opportunities. At a city level, joint ventures and partnering are a key part of the equation. Local food could create spin off benefits, but it is still a small sector for supply chain development.

### Our findings

As we reviewed the sustainability initiatives underway in UK cities, a small number of themes emerged as common to most, if not to all of them. These were:

- Communities and neighbourhoods
- Economic regeneration
- Governance and stakeholders
- Collaboration

The role of communities in delivering sustainable outcomes is becoming increasingly significant, possibly helped by the developing Big Society agenda. A number of cities are trying to facilitate, host or otherwise encourage a variety of community initiatives. The interface between communities and the private sector is an important and challenging one.

There is a strengthening focus on the economic outcomes from sustainability initiatives, as illustrated by examples from Birmingham, Bristol and Liverpool. All show a strong focus on the economic impacts.

With the potential for executive mayoral leadership being adopted by other major cities beyond London, governance is an area not only of high importance to UK cities, but also considerable uncertainty. Governance structures rightly absorb a lot of

attention. External influences mean the ideal structures will need to evolve over time, so simplicity, scalability and flexibility should be the watchwords wherever possible. New institutions created to deliver sustainability initiatives should ideally counteract rather than compound the complexity inherent in our existing governance structures.

Collaboration between UK cities in the sustainability arena is limited at present. One risk is that the ‘sustainability wheel’ will be invented several times over, at a higher cost as economies fail to replicate good models at scale. Local energy generation is a good example of where more collaboration between cities would seem to make sense – the key aspects of sustainable energy solutions are broadly similar across all UK cities, and there are examples elsewhere of close municipal collaboration, for example in Germany. While competition between cities is inevitable, the smart cities will know where to collaborate and where to compete, and be capable of doing both.

District heating networks offer instructive examples of established sustainable energy strategies. What is notable with these examples is that they show a variety of corporate models and chart a steady evolution over a number of years, rather than a ‘big bang’ approach.



## Our recommendations

It is clear that planning and executing a programme of sustainable investment is a long-term commitment. There are a number of areas that should be examined to ensure policy and funding are better directed at delivering these programmes. We make proposals in a number of areas:

**Governance** – creation of city-based Infrastructure Investment Boards (IIB), with a life outside national and local political cycles. These bodies would be durable, independent and accountable.

**Finance** – creation of city-based City Investment Funds to draw a wide variety of finance into a city-focused vehicle, sitting alongside the IIBs.

**Investment appraisal** – the Treasury Green Book is not ‘green’. Its rules are not suited to the long-term drivers that underpin the sustainability agenda. It is seriously in need of reform.

## Our vision

The city of the future is an eclectic mix of sustainability solutions and shorter supply chains, and will be achieved in the face of major challenges and resistance. It is clearly recognisable as the descendant of today’s city and doesn’t deny its heritage, but is technology driven, and less dependent on grid and global supply chains (although by no means detached from them). Alongside the continuity, the biggest changes are intangible, including a growing sense of pride and ownership in the city.

The task at hand now is to start to create delivery structures and implement programmes – drawing on the experience and resources of the private sector, as well as finding effective mechanisms for collaboration and partnership between the cities themselves.



**Nathan Goode**  
Head of Energy, Environment and Sustainability  
Grant Thornton UK LLP

# People, places and business

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## What does sustainability mean?

This is a crowded space. Sustainability has spawned much analysis and many different definitions. The World Commission on Environment and Development (the ‘Brundtland Commission’), for example, talks about not “...compromising the ability of future generations to meet their needs”.

Grant Thornton defines sustainability as assessing the long-term viability of a project, programme or initiative in terms of its use of resources and its environmental, social and economic impacts. Clearly the key words are ‘long term’ and ‘viable’.

There is plenty of room for debate. Nevertheless, both businesses and public bodies are now making a strong link between the sustainability of the environments in which they operate and their own long-term sustainability and viability.

## The four pillars of sustainability

There are four key aspects to sustainability, which are widely documented. They can be illustrated as ‘pillars of sustainability’. They are:

The **economic** – which is the requirement for the city to sustain its competitive position and thrive in business terms

The **environmental** – which is about both the physical envelope in which a city exists, and the ‘footprint’ of the city as it draws on basic resources

The **social** – a good quality of life for citizens, good public health, mechanisms to tackle deprivation and inequality, and creation of an attractive community or communities to live in

The **institutional** dimension. This plays an interlocking or supporting role to the other ‘pillars’ – creating sustainable institutions and governance mechanisms which align with long term sustainability objectives. The recent institutional history of the UK is one of profound change, often leading to fragmentation and instability. The relationships between the individual, the businesses that sustain, the institutions that govern and the communities that provide the social context, have changed beyond recognition in the past two decades. Addressing the institutional, or governance dimension, is therefore a major component of any UK sustainability strategy

Institutional change continues with the new coalition government, with measures such as the replacement of Regional Development Agencies with Local Enterprise Partnerships, the abolition of regional spatial planning and the launch of the Localism Bill. As the nation tries to feel its way towards a new paradigm of governance, it needs to be recognised that sustainability initiatives, by definition, need to restore some of the long-term stability and interconnectedness that in some places have become eroded over the years.

Plenty of resources are expended in trying to determine how sustainable a city is. The extrapolation from a diverse set of indicators (which in themselves may be subject to challenge) to a broad concept of ‘sustainability’ as an amalgam of these indicators needs to be treated with great caution. From there to create league tables of sustainable cities, apart from satisfying a public appetite for winners and losers, seems to have limited value in furthering sustainability objectives. It may also obscure the need for greater collaboration between cities by framing the debate as a form of competition.



A sustainable city measures itself at the moment in qualitative terms – by the leadership and governance arrangements that are in place to ensure that the characteristics of a sustainable city are funded, protected, influenced and managed effectively. For example:

- What policy statements and commitments have been made to tackle climate change and sustainability?
- How are these policies tied to the strategic long-term planning for the city?
- How informatively are carbon emissions and energy usage measured?
- How are responsibilities for climate change, energy use and sustainability managed across the city?
- What level of collaboration exists between the city authorities, other public sector bodies, third sector and businesses to deliver an agenda focused on the city itself?
- How successfully are behaviours being changed to move towards households and businesses becoming sustainable? And what is the role played by communities in this process?

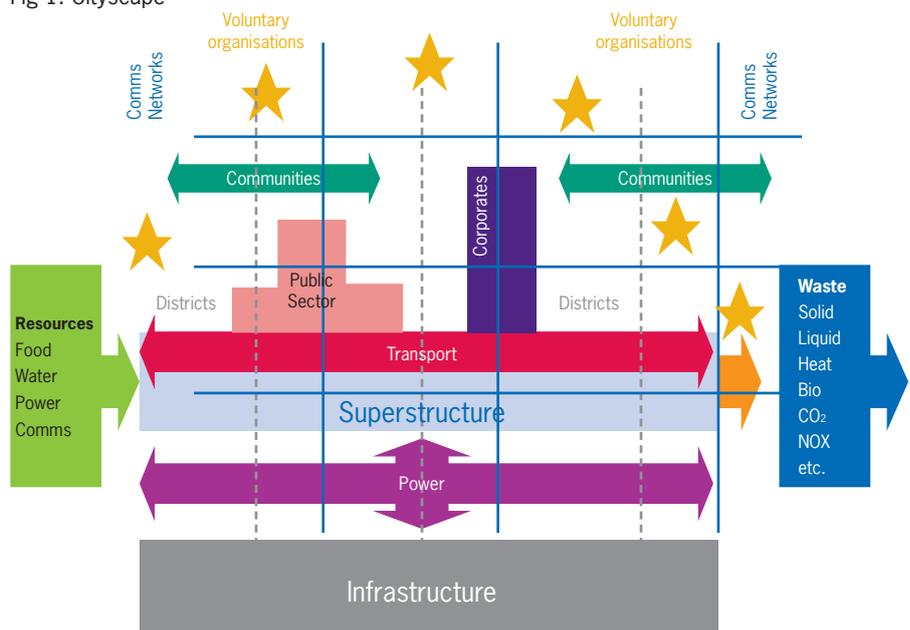
## Places

The term Sustainable Cities has come into increasingly widespread use over the past decade. However, as our research shows, people are using the concept to underpin a wide range of different policy objectives.

It is easy to forget that the resurgence of cities as ‘good places to live’ is a relatively recent phenomenon, particularly in the Anglo-Saxon world, after more than a century of suburbanisation and ribbon development. Ecologists and environmentalists have

not always been friends of cities, and initiatives such as the UK ‘eco-towns’ programme show that there is still a desire in some quarters to address sustainability by colonising new space rather than making best use of what we already have. Globally, projects such as Masdar in Abu Dhabi offer an enticing and futuristic view of sustainable city living. However, the reality in the UK is that the real change needs to take place within existing urban environments and for the most part using existing buildings.

Fig 1. Cityscape



## How important are cities to global sustainability?

Cities date back millennia (the town of Jericho has been continually occupied for 10,500 years), and urbanisation really began to gather momentum in the nineteenth century. It continues to accelerate today. We reached a ‘tipping point’ in 2008 – the number of people living in cities outnumbered those who didn’t for the first time, according to UN figures. Stewart Brand (Whole Earth Discipline) predicts that by the mid-century the population may be 80% urban. In many developed economies (including the UK), the phenomenon of suburbanisation in the twentieth century consumed large areas of countryside as people sought to get out of the city proper while retaining the material benefits of an industrialised society, creating urban sprawl and ramping up pressure on resources.

We are a planet of cities, whether we like it or not. The good news is that by some measures, cities are actually efficient users of resources. For example, cities are generally more efficient per capita in regards to CO<sub>2</sub> emissions. Whole Earth Discipline, however, highlights some of the extraordinary ways that sustainability strategies are evolving in modern cities. As Brand puts it: “Cities accelerate innovation; they cure overpopulation, and while they are becoming the greenest thing that humanity does for the planet, they have a long way to go.”

## The complexity of cities

Cities are complex organic entities. A city schematic in two dimensions underlines this complexity.

The complexity of the cityscape (see Fig 1, page 9) in part derives from the diversity of stakeholders within cities, including citizens, communities, local government, the health service, universities, emergency services, transport authorities, housing associations, utilities, large corporates and SMEs across a broad range of sectors. Organisational structures have become more fragmented in both public and private sectors in recent decades as responsibilities have been devolved and business supply chains have become more complex and the players more specialised.

The challenge cities face is putting these pieces back together to deliver an integrated approach to sustainability. This requires a complex governance process and collaboration between diverse parties to deliver city-wide agendas. If defining and measuring sustainability has the potential to be a life’s work, creating structures for consensus and engagement around a common set of goals among these stakeholders could easily be another.

So rather than three planets, a dedicated sustainability champion might need three lives to see the results of his or her efforts – such is the scale of the challenge.

In a Western European context, at least, the complexity of the city, evolved over decades or centuries of multi-layered social and economic activity, is a key challenge. Attempts to over-ride this complexity through top-down planning or other forms of ‘social engineering’ have often left a toxic legacy. As John Kay, in his book *Obliquity*, put it: “Only an arrogant man would believe he could plan a city, and only an unimaginative man would want to.”



## Sustainability strategies for cities

We have seen a wide variety of points of departure for sustainability strategies adopted by UK city authorities, tackling what they see as the key priorities or opportunities for early wins.

For example:

**Economic** – Liverpool City region's offshore wind supply chain strategy

**Environmental** – Stoke's 'rewilding' strategy for biodiversity in urban spaces

**Institutional** – creating effective governance and delivery structures in the Manchester city region

**Social** – London's and Paris's bike schemes

## People

Policies and strategies don't operate in a vacuum. The huge and unpredictable variable is how individuals, communities and organisations will respond to them. Tim Jackson, in *Prosperity without Growth*, talks about the disconnect between supposedly rational economic policies and unpredictable outcomes. On the positive side, effective engagement can be a hugely powerful tool; government at all levels across the UK is clearly seeking to harness this both within and beyond the sustainability arena. The downside is that not achieving effective engagement will lead an initiative to failure.

## Sustainability champions of the nineteenth Century – Robert Stewart (Glasgow)

On a wet morning in October 1859, Queen Victoria flicked a switch to send 50 million gallons of water flowing to Glasgow, bequeathing an infrastructure that still exists today. Glasgow had seen three major cholera epidemics in the previous decades, the first of which alone in 1832 killed over 3,000 people.

Not everyone was happy with the result – one woman, angry at the closure of a well from which she had continued to draw water, said: "I canna thole that new water, it's got neither taste nor smell."

The Lord Provost Robert Stewart is relatively unknown nowadays, but Stewart took on the task of securing clean water for Glasgow and getting the necessary Water Bill passed in Parliament. He delivered the water system for Glasgow in the teeth of significant opposition and ultimately at great personal cost, dying of a heart attack at the relatively early age of 56.

Stewart trained as an accountant – so perhaps there is hope for us all.

## Securing engagement on sustainability

There is an impressive array of sustainability-related media seeking the reader's attention and engagement. Some strategies make more effort to engage the reader than others. One strong example of a direct appeal can be seen in the Mayor of London's consultation document published in February 2010, entitled Delivering London's energy future – The Mayor's draft Climate Change Mitigation and Energy Strategy for consultation with the London Assembly and functional bodies.

The foreword is snappier than the title. It is written in a direct and unorthodox style, which is likely to predispose the reader towards thinking this voice credible and authentic.

It presses a number of different 'buttons', each of which represents a different kind of appeal:

- incentive** – persuading people that they will benefit from the initiative
- challenge** – persuading people to respond and potentially make sacrifices for the environment, the general good or as a legacy for future generations
- reassurance** – persuading people that the situation is under control, for example that the lights won't go out in five years' time
- timing** – articulating the timeframe over which initiatives have to take place. This is always going to be difficult to get right because no-one has a crystal ball.

Sustainability strategists have to choose which combination of these themes to address when communicating sustainability initiatives. This is a difficult decision, and there may need to be a choice between the most palatable and the most credible theme. Should the writer, for example, try to convince the consumer that their lifestyle will not be affected by the initiative? How the message is presented may significantly affect its chances of success. On the other hand, the public does not respond well if it suspects inconsistency – or that it is being 'sold a line'.





Credibility (or the apparent lack of it) has been shown on numerous occasions recently to be an absolutely key factor in the climate change debate. As the choices become tougher, it seems reasonable to assume that the need for credibility will only strengthen. Clearly, conveying an impression of authenticity is not necessarily the same as actually being authentic, but, even if it makes the message harder to sell, transparency and honesty are in our view going to be critical success factors for sustainability strategies.

Engagement is about participation. In keeping with a more general trend towards localism and the development of communities, a great deal of effort is being put into structures to facilitate community renewables projects. Funding is both a key challenge and, properly structured, a key incentive to secure engagement. The level of interest in funding community renewables is on the increase and the subject would merit a report on its own. It is worth noting, however, the recent success of Ecotricity's EcoBonds (50% over-subscribed) and the longer established

Energy4All community energy programme, which in May 2010 announced a successful £1m share issue for Energy Prospects, an early stage fund for community projects.

These early movers are breaking new ground for funding sustainability projects at a local level.

## Human responses to climate change

### DECC case studies

An example of how engagement with the public can go horribly wrong is the now infamous 'bed-time story' format used by the UK Government. Over the course of October 2009 to February 2010, the Advertising Standards Authority received 939 complaints about the Department of Energy and Climate Change's Act On CO<sub>2</sub> 'Bedtime Story' TV ad and accompanying nursery rhyme-themed press ads.

ASA listed the main objections as follows:

1. The ad was political in nature and should not have been broadcast
2. The theme and content of the ad could be distressing for children who saw it
3. The ad should not have been shown when children were likely to be watching television
4. The ad was misleading because it presented human induced climate change as a fact when that was not the case
5. The claim "over 40% of the CO<sub>2</sub> was coming from ordinary everyday things" was misleading
6. The representation of CO<sub>2</sub> as a rising cloud of black smog was misleading

7. The claims about the possible advent of strange weather and flooding in the UK, and associated imagery, were exaggerated, distressing and misleading
8. Many complainants objected to some of the press ads because they believed there was a significant division of informed scientific opinion on the matter

This campaign could be said to have failed to press all of the buttons effectively. As a result, the campaign's primary objective, which was to 'challenge' people to take personal ownership of the agenda, was lost.

## Nudges

The Demos report, *Resilient Nation*, talks about 'nudges'. Nudges are a series of small steps to direct individual behaviour towards the achievement of an overall objective. The concept of 'nudges' is gaining credibility as an alternative to high profile 'big bang' initiatives which are costly and carry a high risk of failure.

The report quotes the Government of Queensland's strategy to reduce water consumption during the decade-long drought. This is an interesting case study because it suggests that a strategy of nudges can be highly efficient in the short-term but also difficult to sustain.

In 2008 water officials set the target of reducing daily water use per person from 80 gallons to 57. A series of campaigns focused on things such as taking short showers, teeth brushing, car washing, toilet flushing, etc. Daily per person use dropped to 32 gallons within a space of only two weeks. This subsequently stabilised at a slightly higher level of 38 gallons, but was still well below the long-term target of 45 gallons per person.

In the aftermath of the crisis, however, traces of this direct and personalised strategy are hard to find. A website had been created for South East Queensland with the catchy title of 'Water Forever.' Two years on, however, site visitors would be referred to the rather more formally titled Queensland Water

Commission (QWC). Following through to the South East Queensland Water Strategy document, this turned out to be 140 pages articulating in careful detail the commission's own strategy. Jumping to the list of actions at the end of the document, these are almost wholly institutional in nature. There are no citizen focused solutions in this document, and it makes an interesting contrast with the Mayor of London's direct and personal appeal referred to earlier. Between the time of researching this section to publication, Queensland has had to deal with the aftermath of catastrophic flooding, which is likely to require another major rethink of its water management strategy.

One of the coalition government's innovations during 2010 was the creation of the 'nudge unit', or the Behavioural Insight Team. The idea is that governments are better off providing the right choice architecture, making it easier for people to make better choices for themselves and for society. It is too early to see whether this approach will become embedded in policy-making; replacing large-scale, high-profile initiatives with a series of small steps will require not only skill in implementation, but also the UK's political and administrative classes to shake off the habits of several generations.

## Four Pillars: Institutional

### Infrastructure Australia (IA)

The Infrastructure Australia Act 2008 came into effect on 9 April 2008, paving the way to establish Infrastructure Australia, which is a new, national approach to planning, funding and implementing the nation's future infrastructure needs.

Infrastructure Australia's role is to develop a strategic blueprint for the nation's future infrastructure needs and – in partnership with the states, territories, local government and the private sector – facilitate its implementation.

It will provide advice about infrastructure gaps and bottlenecks that hinder economic growth and prosperity, and will also identify investment priorities and policy and regulatory reforms that will be necessary to enable timely and co-ordinated delivery of national infrastructure investment.

The Major Cities Unit has been established to provide advice to the Australian Government and Infrastructure Australia on issues of policy, planning and infrastructure that have an impact on cities and suburbs.

IA's vision for Australia's cities is that they are:

**Productive**, and globally competitive, with integrated land use, transport and infrastructure planning driving more efficient investment and outcomes

**Liveable**, improving the quality of life, health and wellbeing of people who live in, work, or visit cities

**Sustainable**, environmentally, socially and economically.

The State of Australian Cities 2010 report represents the first major output under this stream.



## Business responses to climate change

Making the right kind of appeal, pressing the right ‘buttons’ and understanding the variety of analytical and emotional frameworks used are as relevant in the business world as they are with individuals. The increasing complexity of the debate about what sustainability entails is to be welcomed, as with this complexity comes the realisation that sustainability issues are increasingly embedded in business models and growth strategies.

Embedding sustainability issues is not without its challenges. Using the example of energy efficient retrofit of domestic and non-domestic building stock, the government report on Low Carbon Construction published at the end of 2010 references a “powerful sense of pent up potential in the construction industry”.

The report notes a requirement for a clearer path for construction businesses through the complexities of transitioning to a low-carbon economy, cooperation between government and industry and for confidence that market failure will be addressed. The construction industry is calling for strong leadership and regulation (a call for the institutional pillar of sustainability) to ensure that occupiers are incentivised to take up innovative/alternative products aimed at carbon reduction. In our own discussions with the industry players, the message

echoes that of ‘pent up potential’, that businesses are gearing up and ready to form supply chains, but this will only speed up when there is more certainty on the economic opportunity that there is consumer demand for the retrofit and refurbishment of products. Currently all attention is focused on the government’s forthcoming Green Deal. The Economics of Ecosystems and Biodiversity (TEEB) for Business Report, published for Unesco in July 2010, is a pointer to the future of sustainability in business. The report showed that over 50 per cent of CEOs surveyed in Latin America and 45 per cent in Africa saw declines in biodiversity as a challenge to business growth.

In contrast, however, less than 20 per cent of their counterparts in Western Europe shared these concerns, which suggests that if we are on a road to a sustainable business future, it is a long one.

Business is taking sustainability increasingly seriously. There are clearly a number of motivational factors for this; business sees the need to respond and take action, and take account for its actions on the environment which, in many cases, is a global one.

This is how the CEO of Vodafone, one of the market leaders in sustainability reporting, articulates the rationale for his company’s approach in their 2010 sustainability report:

“...we still face significant challenges to deliver a sustainable society in which business and its stakeholders can prosper in the long term. The lack of a legally binding international agreement on climate change from talks in Copenhagen and the lack of progress on some of the most pressing issues facing the billions of people in emerging markets, underline the urgent need for a cohesive strategy between public and private sector that meets the needs of society as a whole. I firmly believe that Vodafone and the sector in which we operate have a key role to play in shaping a more sustainable society... Sustainability challenges are a key stimulus for innovation within the business.”

Thanks to Accounting for Sustainability, sustainability reporting is at the forefront of the reporting and governance debate. Virtually every aspect of economic activity in the twenty-first century consists of complex and extensive supply chains, and tracking use of resources and waste outputs along these supply chains is in its infancy. Sustainable cities of the future need not only to reduce the carbon embedded in these supply chains, but also to be able to build in resilience in these supply chains, understand how they operate, and in some cases reshape and shorten them. In this regard, cities can and should learn from big business. The reverse is certainly also the case. Multi-nationals with national supply networks need local content to adapt their top-down strategies.

### Accounting for sustainability

In 2008, HRH Prince of Wales created the Accounting for Sustainability Project. This is a global project, with participation from a large number of accounting bodies, large corporates, public sector bodies and accounting firms, including Grant Thornton, which alongside other firms seconded staff into the project team.

The project has created the International Integrated Reporting Committee (IIRC), whose remit is to create a globally accepted framework for accounting for sustainability, which brings together financial, environmental, social and governance information in a clear, concise, consistent and comparable format, painting a picture of an organisation's total performance to meet the needs of the emerging, more sustainable, global economic model.

In some cases the sustainable cities agenda will align with private sector interests; in others, compromises and accommodations will need to be made. Much business-driven change will be 'sustainability agnostic' – in other words it can be done in a sustainable or an unsustainable way; it can be harnessed as a force for good or for evil. Developments in IT and communications, for example, are revolutionising the transportation of people and goods.

Partnerships between individuals, communities, public and private sector seems to be a crucial ingredient in delivering sustainability strategies. For it to be effective it needs to recognise the diversity of aims and objectives of these players.

More on the economic opportunities in specific cities is included in the chapter on Sustainable UK Cities. In some ways projections of size, scale and timing can be distracting as they tend to be no more than global estimates often turned to specific ends. What is clear, however, is that the scope for change is enormous.



## The city paradox. Back to the future

Our legacy has positive elements as well as challenges and obstacles. Pioneers of nineteenth century infrastructure improvement faced huge challenges and surmounted them. Granted, these pioneers often used the machinery of municipal government and civic pride to drive improvements in the city's infrastructure. Today's stakeholder picture in cities is considerably more fragmented. However, the story of how utilities were first established in Victorian cities, for example, as told in Tristram Hunt's book 'Building Jerusalem', shows that the battle to create sustainable cities is as old as the cities themselves. Cities have always had to fight to remain sustainable through times of economic boom and bust, and balance the pressures from intensive use of resources and waste production against the benefits of economic growth.

Cities are the engines of economic growth and therefore they are also the nexus of resource usage (electricity, heat, water, fuel, food, etc) and waste output (biodegradable and non-biodegradable solid waste, sewage, CO<sub>2</sub>, other airborne pollutants, excess heat, etc). One thing all commentators can agree on is that if there is a looming global resource and waste problem, it has to be fixed in cities, or we are wasting our time. Cities are also the places where the concentration of demand and resource use means that capital-intensive solutions such as waste to energy and district heating make most economic sense and have minimum transmission losses.

## Conclusions

At the same time, if humanity is to reach population levels of 9.2 billion by 2050, this level of population is unsustainable without cities.

We have set out in this chapter what we understand by sustainability and sustainable city, and the challenges of measuring both. The institutional pillar of sustainability is in our view crucial and under-represented, and while it is important to measure how seriously a city and its citizens take sustainability, we believe that measurement at this generic level is a second-order issue.

While city authorities are key players, they don't have all the answers, or all the powers, and certainly not the money. They have to plan both to combat climate change and to mitigate the effects of climate change, taking a view, in effect, on how successful or otherwise global efforts to reduce CO<sub>2</sub> are likely to be.

Behavioural responses to sustainability strategies and initiatives will be complex and unpredictable. As humans we have an analytical legacy that can't simply be ignored. Consistency as well as coherence of objectives seem to be vitally important, as is a range of targeted approaches. Presentation of the message is part, but not all of the picture.

In the past, furious debate and opposition have often stood in the way of change, despite the economic and social benefits that subsequently resulted, so in that sense the challenges that cities face today are nothing new.

# Policy, funding and supply chains

The previous chapter looked at some of the influences on the key actors in the development of sustainable cities: the people, places and the businesses. Here we consider some of the elements that link them – the policies, the funding mechanisms and the supply chains.

## The interplay between nation and city

Cities and city regions face a wide array of regulation, policy, incentives and potential funding sources across all of their areas of activity, but no more so than in the area of sustainability.

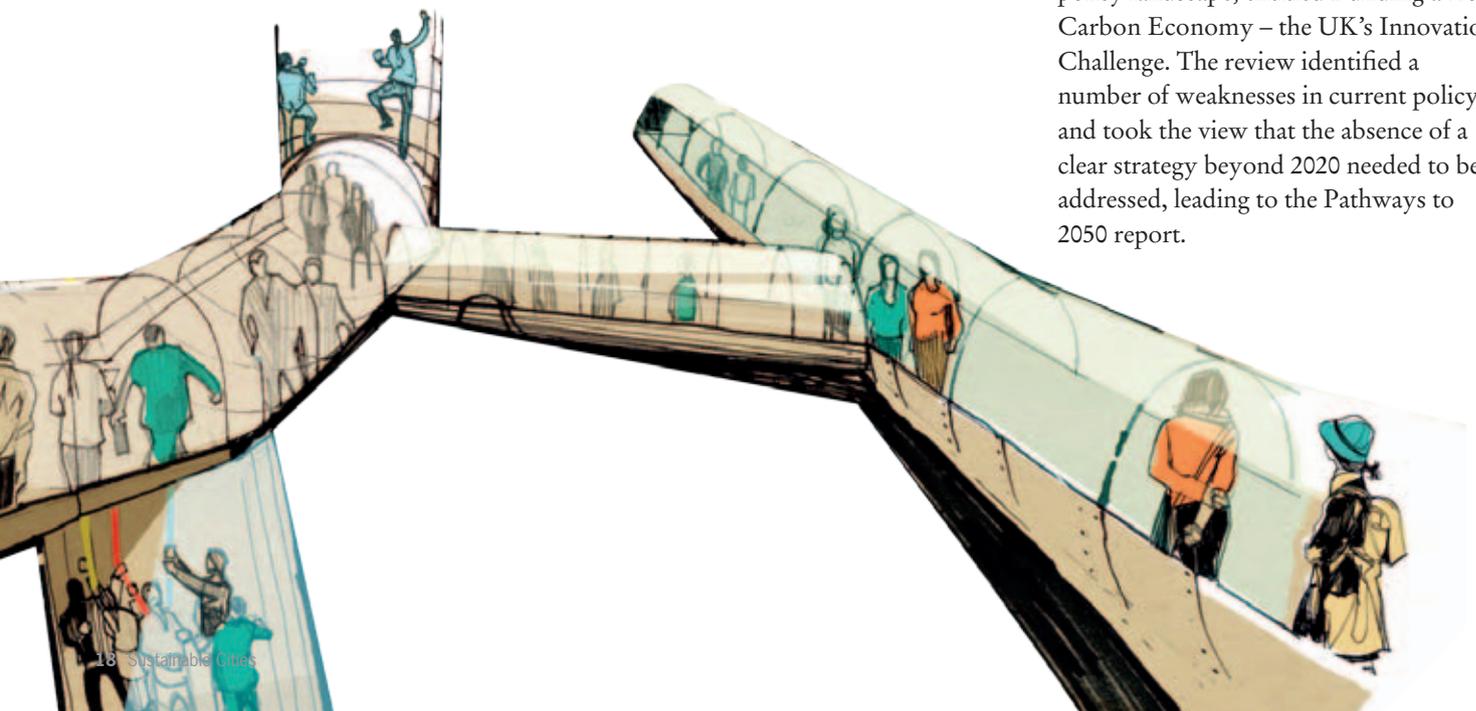
A plethora of cross-cutting and in many cases conflicting policy drivers awaits the sustainability champions of UK cities.

The responsibilities of city authorities were thrown into sharper perspective following the publication of the Spending Review (SR10) in October 2010. The changed policy landscape also created opportunities for cities to move towards greater sustainability, forcing public sector bodies to focus on the more efficient use of resources. Structural changes in the delivery of public services may also create opportunities to re-orientate these to deliver more sustainable outcomes. While the immediate consequences of reprioritising to deal with the spending cuts at local authority level are looking painful at the moment, a number of the sustainability champions who we spoke to saw opportunities as well as challenges in a post-SR world.

The policy landscape is complex and in a state of continuous evolution. The supply side (ie the provision of energy) illustrates this.

The Spending Review, for example, reinforced a broad UK government commitment to supporting low-carbon energy through the feed-in tariff (FIT) mechanism and a forthcoming Renewable Heat Incentive (RHI), but held out the prospect of future cuts in FIT support, was unspecific about RHI, and removed the financial incentive within the CRC Energy Efficiency scheme as well as delaying its implementation.

Back in July 2010, the Climate Change Committee (CCC), which advises the UK government on climate change matters, issued its review of the current policy landscape, entitled Building a Low Carbon Economy – the UK's Innovation Challenge. The review identified a number of weaknesses in current policy and took the view that the absence of a clear strategy beyond 2020 needed to be addressed, leading to the Pathways to 2050 report.





It highlighted the scale of the funding required and the need to co-ordinate funding streams, irrespective of how the institutional arrangements work. It is also recognised that the lack of post-2020 policy potentially hampered funding of long-term investment. This was followed by the Fourth Carbon Budget in December 2010 and the Renewables Energy Review in May 2011.

The DECC Annual Energy Statement, also published in July 2010, summarised the government's direction on policy, so partly responding to the issues raised by the CCC. DECC agrees that the current regulatory approach to incentivising energy efficiency in business and industry can be confusing. The key elements, summarised below, indicate the comprehensive approach to policy:

- reducing emissions from the UK's ageing housing stock is identified as being of critical importance
- energy security and the transition to a low-carbon future should be considered together
- the need for market reform is reiterated across a number of areas, including carbon, electricity markets, planning and grid connection
- support, including through the Green Investment Bank, for key technological developments from micro-generation to carbon capture.

## Sustainability champions of the nineteenth century – Joseph Bazalgette (London)

London is famous for its 'Great Stink' in 1858, which provided one of the most visible 'trigger points' in the development of cities in the nineteenth century. Despite the two preceding cholera epidemics in 1849 and 1853, which together killed about 25,000 people, it was the Great Stink that gave Joseph Bazalgette, London's Metropolitan Board of works' first, and only, chief engineer, the chance to create a network which comprised some 82 miles of sewer at a cost of over £4 million, taking until 1875 to complete.

Modern Londoners owe him a debt of gratitude for over-scoping the project – having the foresight to design the pipes and tunnels in the system at double the diameter of what he calculated was required.

He reportedly said: "Well, we're only going to do this once and there's always the unforeseen."

The Energy Bill introduced to the House of Lords in December 2010 implements elements of the Annual Energy Statement, specifically provisions to enable the set-up of the Green Deal. The statement contains a significant policy shift – while centralised, grid-generated clean energy still remains a major part of the strategy, there was a material step-up in the consideration being given to decentralised and built environment-related solutions. This policy shift is critical to the energy components of city sustainability strategies. A key point is that making policy at the national level is complex, with multiple initiatives which interact in complex ways and have unintended consequences. When we add in the interaction between the rapidly evolving

policies at the city, national and European levels, it is clear that great care is required to produce reasonably efficient outcomes.

At the time of writing, the energy sector now faces significant change in the form of the Electricity Market Reform. While this reform is designed to create a more efficient transition to a low-carbon economy, the short-term impact may be some element of deferral of investment decisions, which in turn may affect planning for projects in cities. However, taking the long view, it is clear that national policy is still firmly orientated towards a low-carbon future.

The economic opportunities for decentralised energy are increasing. Both FIT and the RHI provide revenue generating opportunities for local authorities.

### Cities and future policy

The tension between the city and the state as the driver for change is nowhere clearer than in the area of sustainability. The interplay between cities and states is a key dynamic in terms of networks, governance structures and allocation of resources. The IBM report, *A Vision of Smarter Cities*, goes further, effectively arguing that the twenty-first century is the century of the city, not the nation state. If that is the case, national policy has yet to catch up, although as we say above, there have been some significant moves in this direction.

There was a strong view among sustainability champions of UK cities who we spoke to as part of this report, that the decades prior to the 2010 General Election were characterised by a dilution of the powers of cities to manage their own affairs. Equally, there is a sense that this might change as a result of the SR10 and the general direction of travel towards greater localism. At the same time, the localism agenda might start to create structures and organisations that operate at a sub-city level, so the city layer of governance might become more porous and need to deal with sub-council forms of governance (eg stronger community groups) as well as attracting more responsibility from national government.

### Funding and finance

Sustainability issues have the potential for significant impact on financial and risk management for local authorities. The long-term rise in energy costs in the context of constrained finances presents obvious issues in terms of investing to save. The other major class of future cost arising from responding to climate change is adaptation: from flood defence measures to cooling systems in residential facilities for vulnerable populations. Tri-generation (electricity, heating and cooling) is becoming an increasingly in-vogue concept. But to the simple cost equation is added a range of financial incentives that can be revenue-positive.

In all of this, the role of investment appraisal is required and, as we say later in the report, the current mechanisms for investment appraisal may not be fit for purpose to allow the right investment decisions to be made.

The ability to assess the financial implications of incentives such as ROCs, FITs and any future heat incentives will be critical. The recent repeal of the ban on local authorities selling electricity under *The Local Government (Miscellaneous Provisions) Act 1976*, along with the creation for local authorities of a general power of competence, provides an unprecedented opportunity for cities to combine economic and environmental objectives, and represents an addition to local authority powers.

Any consideration of funding must also acknowledge the planned creation of the Green Investment Bank (GIB).

Timing and detail of implementation, however, remain uncertain. The GIB is intended to act not just as a lender to projects driving carbon reduction and sustainability, but also as a co-ordinator and clearing house for funding of such projects more generally. Announcements to date have suggested that the balance of its activity will be towards large-scale infrastructure rather than city-based smaller scale initiatives. Possibly a more influential programme will be the Government's Green Deal, designed to finance extensive retrofitting of energy efficiency measures to existing houses. How this will dovetail with the strategies and programmes of cities themselves remains to be seen.

European policy on sustainable cities, including support funding, sits in the context not only of the EU's climate change policy and its bid for leadership in green technologies, but also of the EU's wider strategic objectives and programmes and the wide range of regional influences. Broadly, sustainability is not seen in Europe as just being about climate change. Measures and incentives that are targeted at reductions in greenhouse gases form just a part of a much more complex and multi-faceted picture.

The commercial appetite for green investment is undoubted. The amount of money invested in clean-tech is huge. Globally, the figure has been estimated at US\$80 billion (roughly twice the figure invested in dot com). And yet the figure still required is even more vast. There is a real risk of investor fatigue in this market.



Scale and risk are the critical factors affecting the availability of finance for low-carbon projects. For instance, evidence from our work suggests that portfolio benefits start to emerge for solar PV schemes at 2,000 units and above in terms of efficient planning, low transaction costs/unit and being attractive to funders. If a number of estates across a city region were to collectively procure comprehensive solar power installation, then the project would become easier to finance.

With scale, the transaction costs of raising equity and debt will be lower in terms of due diligence, documentation and promoting the scheme. The supply chain will be able to secure economies of scale, and the collection of revenues (for instance, via sharing savings with residential consumers) could be aggregated and made more efficient and secure.

Similar considerations apply to other forms of distributed power generation and sustainability initiatives.

### The role of cities in funding

What is the role of cities in securing funding for sustainability projects? Structured engagement with the EIB (European Investment Bank) and, when formed, the GIB, may be important in this area in developing common approaches that gain market acceptance and are thus replicable. There is a need for an explicit alignment between funding sources, the city as a place and the associated governance structures.

There are a number of interesting developments in the funding of cities. For example:

- JESSICA is an EU funding mechanism for sustainability and energy efficiency projects in urban areas. The JESSICA programme channels funding from the European Regional Development Fund (ERDF) to support the adoption of sustainable investment in cities. Funding is not focused on cities per se outside London, but on regions.
- A number of JESSICA funds are in place and London is pushing forward with the creation of the London Green Fund, focused on the waste and energy efficiency sub-sectors.
- The quantum of funding available is small relative to the ambitions of cities; for example, London is £100 million, while Scotland and the North West of England are around £50 million.
- Tax Incremental Funding (TIF) is being developed in both England and Scotland. It enables local authorities to borrow against predicted growth in their locally-raised business rates. This creates the opportunity for the public sector to invest in infrastructure and effectively bridge a funding gap, which is repaid through attracting new businesses to the invested area. At the moment TIF is being considered in broad regeneration terms, but there is no reason why TIF couldn't be framed in specific sustainability terms.

We consider that the link between funding and cities needs to be strengthened, and in Chapter 5 we outline our proposals for a city-based funding mechanism.

Planning, consultation and co-ordination will be key factors in determining whether green projects are successful. Cities can have a key role in this regard by aligning policies to facilitate the planning process and brokering relationships between the public, private and the third sectors. In a UK context, a genuine collaboration between these three sectors is needed. Successful operating examples are, however, hard to find. The combination of diverse, fragmented initiatives and the scale at which they need to be implemented, together with the multi-dimensional stakeholder base mean that these projects will be breaking new ground.



## European Union policy and funding support

### Overview

UK policy on CO<sub>2</sub> reduction and sustainability is heavily dependent on European Union policy. There are three main areas where the EU either influences or has the potential to influence the agenda:

- policy agendas and knowledge sharing initiatives
- setting the overarching targets, legislating and thus providing the basis for the UK policy response
- providing funding which may be dedicated to, or directed at, sustainability objectives.

While many of the activities relating to sustainable cities find their impetus in Commission policy, which makes them difficult to ignore, implementation can appear slow and support mechanisms can appear to lack effectiveness. One factor could be the cross-cutting nature of sustainability: a number of directorates have responsibilities falling under this broad banner. This is also reflected at UK government level, with BIS, DEFRA, DECC and CLG all implicated in the deliveries of sustainability initiatives in cities.

Below are some of the key elements of EU policy and funding support influencing the development of sustainable city agendas.



## Four Pillars: Environmental

### Urban bees

According to a BBC article of 9 August 2010, and numerous articles before it, Paris is fast becoming the urban bee-keeping capital of the world. The city has some 400 hives and the number is growing steadily. Some are on the balconies of family apartments, others in public parks or on the roofs of famous buildings. Cultivation of a private honey store is now de rigueur for some of the top hotels and restaurants. The famous Tour d'Argent restaurant opposite Notre Dame Cathedral has just installed hives on its roof-top, as has The Westin hotel on the Rue de Rivoli.

Driving the trend is growing public awareness of the crisis in rural bee-keeping caused by the collapse in bee numbers. City bees appear to be not just immune to the health problems facing their country cousins, but also more productive. According to the association L'Abeille du Grand Paris, a metropolitan hive produces 50kg (110lb) of honey in an average year, and up to 80kg in a bumper season. A country bee-keeper by contrast is happy if he gets 30kg.

This is not a new fad for Paris – migrants from the countryside in the 1800s brought their bees with them, and there has been a bee-keeping school in the Jardins du Luxembourg since 1856.

For the past 10 years the French capital has been officially a pesticide-free zone. The warmth of the city environment also promotes early breeding. But the main reason for the success of urban bees appears to be the variety of flora in the city compared with what is now present in much of the countryside.

## The Covenant of Mayors

The Covenant is designed to be a way of mobilising commitment to climate change measures at the city level. The take-up in terms of the number of local authorities has been impressive; now more than 500 cities are signed up to a formal commitment by the signatory city councils to go beyond the EU objectives in terms of CO<sub>2</sub> reduction, through the implementation of sustainable energy action plans with concrete measures.

This commitment involves, inter alia:

- the preparation of a baseline emission inventory as a basis for a Sustainable Energy Action Plan
- adapting city structures, including allocation of sufficient human resources
- mobilising civil society
- submitting an implementation report at least every second year
- sharing experience and know-how.

There are 28 participating cities and other local authorities in the UK, ranging from London to Kirklees and Birmingham to Glasgow.



## The London Green Fund

This incorporates €115 million dedicated to Urban Development Funds for decentralised energy and waste recycling and waste to energy in deprived parts of London. The emerging focus appears to be very much on energy efficiency.

The key objectives of the London JESSICA fund are to:

- Contribute to a low-carbon economy through installing low- or zero-carbon energy systems
- Increase the capacity of renewable and co-generated energy production
- Increase the numbers of businesses supplied with low- or zero-carbon energy
- Reduce the waste going to landfill and the CO<sub>2</sub> emissions in London
- Help boost the market for investing in the environmental sector by providing finance to de-risk environmental projects
- Help stimulate complementary regeneration activities

The Covenant of Mayors has only been in force since early 2009, so it may be too early to see much in the way of concrete outcomes and changes at city level, but a significant part of the value in this network will be in the exchange of information, knowledge and best practice.

One observation that emerged from our discussions with city sustainability champions was that the Covenant was seen as something of a badge, with only a small proportion of the signatory councils actually following through with actions.

The Covenant currently has a relatively small annual budget of c.€15 million and is, we understand, lobbying for greater financial support. Notwithstanding fairly extensive UK membership, our discussions did not indicate that the Covenant is yet regarded as a major influencer or enabler in the UK.

## Smart cities

In late 2009, the EU announced that it would focus on developing a network of smart cities to demonstrate renewable and other low-carbon energies in Europe, building on the European Commission's Strategic Energy Technology (SET) Plan published in 2007. Europe is investing four times less in energy research and technology development than it did in the 1980s when faced with the oil crisis. The Commission argued that billions would need to be invested in basic research over the next decade to get the Union back up to speed with the US, which has dedicated around €555 million to energy research for the next five years.

The plan was to select 25 to 30 European cities to pioneer green technologies by 2020.

These 'smart cities' were to be the nuclei from which smart networks, a new generation of buildings and alternative transport means, will develop into Europe-wide realities that will transform our energy system.

Indicative cost estimates for a programme from 2010 to 2020 amounted to €10,000-€20,000 million, which may possibly be a factor in the initiative having apparently stalled. The publication of the funding plan has been postponed several times and, at the time of writing, the eventual shape of the initiative had yet to emerge.

## Other SET-Plan funding

In October 2009, the Commission published 'Investing in the Development of Low Carbon Technologies (SET-Plan)'. In addition to the Smart Cities initiative, it set out plans for wide ranging European Industrial Initiatives (EII) supported by the existing European Energy Research Alliance. The report focused on the number of jobs that could be created by each EII.

Over the next two years, the Alliance said it would launch and implement joint programmes addressing the key challenges of the SET-Plan with concrete technological objectives. On the basis of current progress, the EU estimated that the Alliance could expand its activities to effectively manage an additional public investment, EU and national, of €5 billion over 10 years.

The initiatives set out above may well represent opportunities for cities to develop new and existing industries. However, it is a complex picture and most of it is not designed specifically with cities in mind. Can UK cities rely on the EU to map out the path to sustainability? It would seem not.

## European Union general funding programmes

In the absence of a specific funded Smart Cities initiative, cities and regions need to look, as they have done in the past, to the general funding programmes for support. The priorities for the EU were set in 2006 for the six-year period 2007-2013. Based on these priorities, the EU proposed over 300 programmes. The general thrust of the programmes was considered to be broadly similar to the preceding 2000-2006 period, but with a greater emphasis on competitiveness, innovation and employment.

The Intelligent Energy Europe Programme (IEE). IEE has about €730 million of funds available between 2007 and 2013. IEE funds capacity building and spreading of know-how, awareness raising and development of market knowledge, rather than R&D or new technologies. Calls for proposals are made annually and projects funded under this programme include:

- training on new construction techniques that can lead to 50% or more energy savings compared with traditional buildings
- improving the effectiveness of support schemes for electricity generation from renewable energy sources across Europe
- helping Europe's cities to develop more energy-efficient and cleaner transport.

There were four main funding areas for 2010:

- Energy efficiency (SAVE) – energy-efficient buildings and consumer behaviour
- Energy-efficient transport (STEER) – energy-efficient transport and capacity building and learning
- Renewable Energy Sources (ALTENER) – promoting the new RES Directive
- Integrated initiatives – large-scale networking and capacity building activities.

IEE projects are all partnerships between a number of partners in a number of countries (minimum three of each are required).

Other relevant programme categories include:

Structural Funds – including the European Regional Development Fund (ERDF) which helps to stimulate economic development and regeneration in the least prosperous regions of the EU. Funding is targeted to meet three objectives set down by the EC of convergence, regional competitiveness and European territorial co-operation

Financial Engineering Instruments – ERDF is used to support a wide range of financial engineering instruments.

Of these, the funding stream most relevant to the sustainable cities agenda is the Joint European Support for Sustainable Investment in City Areas (JESSICA) which is described earlier on page 21.

JESSICA is aimed specifically at urban sustainability, using structural funds to co-invest in urban development funds with other public or private players. Key areas of focus include:



- Climate change mitigation
- Promotion of waste management and sustainable use of natural resources
- Improvement of urban transport and the urban environment
- Reduction of pollution
- Protection of biodiversity
- Energy efficiency and renewable energy

UK cities are also increasingly becoming interested in the technical assistance facility called ELENA (European Local Energy Assistance), established by the European Commission and the European Investment Bank to facilitate the mobilisation of funds for investments in sustainable energy at local level. Financed through the Intelligent Energy-Europe programme, ELENA support covers a share of the cost for technical support that is necessary to prepare, implement and finance the investment programme, such as feasibility and market studies, structuring of programmes, business plans, energy audits and preparation for tendering procedures, but stops short of funding the projects themselves. Projects that are likely to be eligible include retrofitting of public and private buildings, sustainable building, energy-efficient district heating and cooling networks, or environmentally-friendly transport, etc.

As a signal of greater targeted funding, there is a proposed financial facility, The European Energy Efficiency Facility (EEE-F) due to launch in the second quarter of 2011. It will target investment projects (including sub €50 million) and will invest in energy saving efficiency and renewable energy projects. The facility will be made up of about €125 million EU money invested as risk capital and €75 million from E113.

## Sustainable supply chains

Supply chains matter to sustainable cities because:

- global corporates in the region are increasingly interested in their supply chains for commercial reasons
- local businesses need resilient supply chains
- understanding how supply chains work potentially creates economic opportunities for their region
- shorter supply chains for resources (eg food) can build increased resilience, local ownership and commitment to a low-carbon economy.

At the University of Sheffield Management School, as part of the Centre for Low Carbon Futures, there is a pilot project being undertaken to consider critical themes for a 'Balanced Green Supply Chain System'. The project includes clean technology management, waste minimisation, eco-accounting, and investment models and standards. The starting premiss is that 'Supply chains compete, not companies'.

While the environmental impact of supply chains is increasingly recognised as one of the key issues for business, this is still at an early stage. For example, there is a body of evidence that other than for the larger consumer-facing companies which are predominantly in business to consumer rather than business to business sectors, many businesses approach environmental initiatives in one area of their product or service without a clear understanding of how they may impact on the rest of the

supply chain. Corporate sustainability initiatives often have limited alignment and integration with the core business.

Sustainable supply chains can mean a lot of different things. They can be low carbon, more resilient, more socially sustainable (eg Fair Trade) or designed to reduce the impact on the environment which supports the production of the end product. A green supply chain has been defined as 'a supply chain that has integrated environmental thinking into core operations from material sourcing through product design, manufacturing, distribution and end of life recycling'. The most efficient supply chain is one where there is no waste output. The ideal scenario is a zero waste or 'closed loop' supply chain where all materials are reused, recycled or composted. If this is the ultimate goal, then significant effort is required to track resources and outputs in supply chains and to reshape and shorten existing supply chains.

Closed loop supply chains may not specifically consider the aspect of resilience which is equally important in the context of adaptation. A business may be very efficient in its transportation links, have minimal packaging, and send its waste to a neighbouring recycling plant. However if it sits on flood plain or its suppliers do, there are clear issues around sustainability of that supply chain in the face of the predicted and unpredicted adverse effects of climate change. Here, the economic, social and environmental pillars of sustainability clearly overlap.

## Value creation through green supply chains

Green supply chains are characterised by efficient fuel, and energy consumption, transportation, and less inventory or waste. They have the dual potential to create value to businesses and increase sustainability in a number of ways:

- reduced costs through efficiency measures in transportation and energy costs > direct reduction in CO<sub>2</sub> emissions
- targeted marketing – ‘green’ branding or marketing to others in the supply chain > increased sales, increased consumer awareness of the low-carbon agenda
- waste output reduction > reduce packaging in processes and products, increase recycling, educate consumer in method of disposal
- attracting new capital from sources such as ‘green’ investors who require something more than a sufficient return on their capital
- innovation in product development to respond quickly to legislative or market led requirements.

For businesses that want to go beyond just switching the lights off, the choices to make are extensive. Reduce packaging? Cut emissions? Reduce energy and fuel consumption? Clearly to make the supply chain greener, businesses need to understand their current supply chains in some detail. For some, an overarching commitment with significant strategic objectives might make commercial sense, or senior management might have the resources and vision to drive it through – for example Marks & Spencer’s Plan A, which includes a commitment to spend £200 million on making its business carbon neutral by 2012. Tesco, by comparison, has ring fenced £100 million to support low-carbon technologies. Other national players aiming to impact significantly on low carbon supply chains include car and other vehicle manufacturers in the UK. These large businesses are investing in scrutinising their suppliers to minimise carbon in their supply chains and sourcing a sustainable supply chain for transition to a low-carbon economy.

We heard a concern from our discussions with cities that these national chains didn’t necessarily see the local city picture, but on the other hand, there are clearly big corporate players around the country emerging in some of the city sustainability partnerships.

For other businesses, it might be more a series of more discrete steps, such as Crown Paints reconfiguring their delivery system to avoid empty runs. It might be a series of relatively simple ‘nudges’, which collectively re-orientate the organisation on a more sustainable path.

If a green supply chain needs buy-in from within and outside the organisation it needs to be credible and transparent, and its intent and profile capable of being communicated effectively. The difficulty is finding the appropriate metrics and measures to demonstrate that a green supply chain is in place and that it is achieving the required output.

Take the example of establishing an Environment Management System (EMS) within a business. Businesses are able to gain ISO 14001 accreditation for their certified EMS. However the focus of the accreditation is on documenting the policies rather than demonstrating improved environmental performance. Like the Covenant of Mayors, without questioning the commitment of organisations that seek this accreditation, there is a risk that it becomes a ‘badge’ unless action follows.

In summary, there is much of interest for sustainable cities in low-carbon business supply chains, although there has so far been little consistency between corporate measures and benchmarks. Businesses have also perhaps struggled to evaluate whether their strategies to green their supply chains are effective. Businesses understandably want credit for the green initiatives in their supply chain measurement, but to hold back for want of an already defined set of standards can look like an excuse for inaction. The result of an over-zealous search for consistency and standards could, of course be delay. A key question for business is what is the rationale for early adoption, or would a ‘wait and see’ approach work better.

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## Local food

The idea of increasing the amount of food produced locally in cities, while far from being a mainstream idea yet, is being taken increasingly seriously. Council owned allotments have never been more popular in the UK. Globally, a number of eye-catching initiatives, such as an increased uptake of allotments in the UK; commercial farming in Detroit, Michigan; the success of bees in Paris and the cachet attached to the honey the bees produce; or established urban agriculture in Havana, Cuba. Local food provides a number of ancillary benefits such as increased levels of vegetation, supporting biodiversity, opportunities to strengthen communities and improve public health.

While clearly not a replacement for existing supply chains, it looks to be a viable component of the sustainability agenda, providing an alternative to complex global supply chains which may be carbon inefficient and lack resilience, but perhaps more importantly with the ability to influence the behavioural side of transitioning to a more intelligent use of resources in cities.

We are seeing signs of local food being promoted as part of the localism agenda of the new coalition government. This is a clear example of shorter and potentially more sustainable supply chains with significant ancillary benefits, although the scale of impact from these kinds of initiative remains to be seen.



## Examples of sustainable supply chains

At a city and city region level there are examples of eco parks being established which are designed specifically to minimise resources through locating businesses with synergies on the same site. For example, the Sustainable Industries Park at Dagenham Dock in the regeneration area of Thames Gateway aims to ‘enable businesses to develop synergies, maximise resource efficiency and innovation and minimise waste’, and includes occupants such as Cyclamax, an energy from waste facility, and Closed Loop Recycling, a food grade plastics recycler which sit alongside businesses whose waste forms an input to their facilities. The Sheffield City Region Local Enterprise Partnership is also sponsoring what it hopes will be the first eco-park in the Dearne Valley.

Globally, B2B businesses are driving change. Marks & Spencer’s stated aim is to become the world’s most sustainable retailer by 2015. The following example is of a Sri Lankan supplier of lingerie to M&S which won an award in 2010 for sustainability innovation in its Thurulie factory.

## Case Study

MAS Intimates is a significant player in the Sri Lankan economy, with considerable economic and political power. The wider Sri Lankan context presents both challenges and opportunities: wage and skill levels are relatively high, and to compete in the global economy leading companies need to offer added value, often through contributing an ‘ethical’ dimension – social and environmental – to the supply chain.

The Thurulie factory has been designed to minimise energy through a set of design features that create a building appropriate to its tropical environment. The main green features of the building are:

- designed to sit lightly on the site, with minimum disturbance to ecology, on two floors to minimise footprint
- ‘returned to nature’ at night
- set in a cool micro-climate to maximise thermal comfort and air quality
- use of native plants
- use of green power – hydro and solar PV
- low operating energy, using evaporative cooling, and natural lighting supplemented by LED task lights
- structure of re-usable steel framework and timber flooring to upper floors
- reflective roofing and partial green roof, to minimise heat absorption
- walls and roads built using cement stabilised soil with low embodied energy
- rainwater harvesting tanks to collect storm water
- anaerobic treatment system for waste water.

## Conclusions

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EU funding and support of various sorts under a range of programmes is available, but EU structures are cumbersome and in the main pass through a national filter before reaching cities. The key driver for much of the low-carbon energy funding is knowledge sharing, technology development and capacity building. We think there needs to be more focus on implementation of proven technological solutions with a clear role for the city as a key unit.

The establishment of the Covenant of Mayors is an interesting initiative, but it clearly has limited powers and resources. The deprioritisation of the Smart Cities initiative underlines the challenge of targeting cities as a vehicle for sustainability policy.

EU funding will not in any event be sufficient. So, as the number and scale of such projects increase there is a need to add to the limited mainstream commercial funding that is currently available. It not clear whether the GIB will be a major driver for the funding required. How will a mechanism be created to access institutional capital, pension funds, retail savings via green ISAs, etc, to provide the volume of finance required?

Sustainable cities require low-carbon supply chains. There are clear benefits in greening supply chains which are business as well as environmentally driven. However, the evidence base for businesses to prove the additional value through their supply chains is not readily available. This is in part due to the lack of credible measures and benchmarks which would require to be developed to convince business that low-carbon supply chains are worthwhile, but is also reflective of the complexities and fluidity of the sustainability landscape. Examples of shortening and reshaping supply chains include eco-parks, which are a step towards closed loop supply chains where ultimately all materials are reused, recycled or composted.

The diversity of cities and potential in its universities, research facilities and creative entrepreneurship provide the right environment to support economic development and create new entrants in low-carbon supply chains. Specifically within the low-carbon markets, there is significant advantage in channelling investment into research, commercialisation and development of technology products and solutions.

However, investment is not enough. Low-carbon supply chains can be further facilitated through partnering arrangements with private organisations such as retailers, car manufacturers and utilities. This enables new entrants to low-carbon markets to demonstrate performance, relevance and potential commerciality of technology.

Lastly, the introduction of climate change legislation provides significant opportunities to technology businesses operating in low-carbon supply chains. It is too early to assess the permanent impact of significant increases in demand for micro-generation technologies following the introduction of the FIT.

# Sustainable UK cities

Today, the concept of a sustainable city in the UK is still more of a vision than a reality. Trying to determine whether one city is more sustainable than another is fun, but the evidence base is limited. It's not a competition, it's an objective that all cities need to move towards.

Each city has its own challenges and opportunities. Our research and conversations with sustainability champions provided a varied and multi-faceted picture of the range of initiatives already underway. It is a continuously evolving picture, and the level of development that has taken place even since we first embarked on this project 12 months ago has been remarkable. During the gestation of this report we have also emerged into a post-Comprehensive Spending Review world, which, as a number of our sustainability champions have observed, means that local government may never be quite the same again.

Although the picture is highly varied, much of the discussion centred around a small number of themes, which clearly represent the big challenges for cities in all spheres, as well as in the context of the sustainability agenda. In this chapter we have drawn on a number of examples to illustrate the different themes; we have unfortunately only room for a limited number of the initiatives we studied.

It is important to stress that this is just a cross-section of UK cities – inclusion or exclusion – does not imply a leading edge position or the reverse; just that the examples given are noteworthy in their own right.

The themes are:

- Communities and neighbourhoods
- Economic regeneration
- Governance and stakeholders
- Collaboration

## Communities and neighbourhoods

Even before the advent of the localism agenda, many sustainability initiatives were beginning to show a decidedly community flavour. Our democratic systems accustom us to a high level of consultation and accountability. Concepts such as the 'Big Society' recognise the value of 'community' and the fact that the units of decision-making need to be quite small to achieve buy-in to major change.

Initiatives based on communities and neighbourhoods bring their own challenges, and our discussions have revealed a wide range of issues and approaches.

Bristol Green Doors, for example, is a citizen-led initiative aimed at putting the Council's and the Bristol Partnership's sustainability objectives into practice at a community level. It is a web-based networking structure aiming to provide





advice and support, and attract private sector companies to deliver renewable energy and energy saving projects. It specifically picks up on the Council's Climate Change and Energy Security Framework to identify where it sees its intervention adding to the process.

At the time of writing, a community energy proposal was currently being developed which was part funded by a solar company, with leadership and support from Bristol City Council. The idea is to stimulate a critical mass involving communities, very much building up from the bottom.

There is clearly significant private sector interest in installing renewable energy solutions, particularly in the solar sector and the south of the UK, but many stakeholders want more than the standard service-based solution. The question being asked is what role communities can and should play in the organisations that emerge to deliver these projects. Models are designed to increase the return that communities can generate from the renewables projects they host. Much of the early progress in community renewables is in rural communities, rather than city, probably because the economic drivers are clearer and the communities more defined, but there is no reason why city communities can't learn from the multitude of community energy projects supported by Community Energy Scotland, for example. Some community projects embrace holistic sustainability objectives, such as the Comrie Project, in **Perthshire**.

Local authorities recognise the need for sustainable communities. In **Fife**, for example, there is a Sustainable Communities Group that consists of Fife Council, NHS Fife, CVS Fife, Skills Development and Fife Constabulary.

Its objectives are to:

- address the causes of poverty – not the symptoms
- focus on early intervention
- improve employability
- promote joint working
- empower communities and individuals.

In cities and their regions, sustainability initiatives immediately face the challenge of whether, and if so, how, to address social inequality – where to target initiatives, and what objectives they should be meeting. Articulating sustainability initiatives around communities in cities is one way of tackling these issues, as well as securing buy-in to the wider sustainability agenda.

Saving energy is one area of the sustainability agenda where fuel poverty and sustainability appear to be closely aligned, and this has received greater impetus since the advent of the coalition government. This has become the core of **Birmingham's** long-term energy strategy, for example, where the focus has been on energy savings in parallel with CO<sub>2</sub> reductions. Phase 1, delivered during 2010 (the pilot phase long-term), in collaboration with 32 householders, 20 businesses and three social enterprises, signed up for the installation of PV solar panels which are estimated to generate

100,000 kWh annually of electricity, saving £14,000 from fuel bills, as well as reducing CO<sub>2</sub> emissions by 1 tonne and generating £41,000 of FIT revenue.

There is much discussion around the planned coalition government's Green Deal, designed to roll out energy saving initiatives in domestic households across the UK. The New Local Government Network, for example, has argued that the current structure of the Green Deal will miss large numbers of those in need from a fuel poverty perspective, because inevitably such householders will be living in homes that are hard to treat. 'Painting the Town Green', New Local Government Network. ECO (the successor to CERT) is intended to address this issue.

In the West Midlands, the Sustainable Housing Action Partnership (SHAP) has been making the case for community scale investment in whole house improvements: 'Community Green Deal – Developing a model for community scale investment', September 2010. It argues that some of the specific community benefits to taking this kind of approach include the restoration of community pride, greater empowerment of communities to save and generate their own energy, as well as creating opportunities for local employment. SHAP argues for a cross-tenure approach based on a street by street uptake.

## Four Pillars: Economic

### Sticky Places in Slippery Space

This phrase was coined by Ann Markusen in 1996, in a project which looked at regional and industrial economics at Rutgers University.

In essence it raises the question why, in an increasingly global and mobile (or 'slippery') economy, some places do better at retaining and attracting businesses and people than others (= 'stickiness'). The stickiness is seen as a kind of conceptual glue or flypaper. The paper also recognises that the glue can become brittle over time and that there are a number of different paradigms for sticky places. A subsequent paper by Cantwell, Iamortino and Noonan develops this concept of 'sticky places' in the context of how multi-nationals develop centres of innovation and new activity in Europe, and observes: "If regions are therefore to entrench themselves in this globalisation process, it is paramount to foster local innovative specialisation in areas of traditional strength."

This suggests that sustainable cities need to build on their strengths – so the transformation to a sustainable city of the future looks as though it might be evolutionary rather than revolutionary.

Within Glasgow, for example, there are wide disparities in wealth between areas and communities. Glasgow has a very high level of fuel poverty where 30% of households spend more than 10% of household income on fuel.

While wealthier middle class areas are likely to have the highest carbon footprint per capita due to fuel consumption from car use or utilities, the poorest elements of society probably have the most carbon-inefficient domestic heating systems. This creates a dilemma for the city authority and other stakeholders around where to target resources and investment. If genuine community groupings can start to coalesce, this will then mean the choices about which projects to target can be made from the bottom up as well as top down.

Although urban community projects are currently few in number, Glasgow boasts the Castlemilk and Carmunnock Wind Project, which has successfully gained consent for 3 x 2MW turbines.

In Manchester's Call to Action it was envisaged that one or two neighbourhoods would be identified as pilots to implement a low-carbon strategy. The emerging reality is more subtle and multi-shaded than that. This is partly because a debate developed about the merits of targeting a high-carbon, affluent neighbourhood (eg Chorlton), versus a deprived area (eg East Manchester) which tends to have a lower carbon usage. This has led to the view that different approaches needed to be trialled.

A very practical community-based initiative in support of the sustainability agenda is underway in the Toxteth/Dingle area of Liverpool. This involves the Mersey Partnership, ScottishPower (the distribution network operator or DNO), Liverpool City Council and a local housing association, Plus Dane, piloting the installation of smart meters.

One of the biggest challenges faced by the Toxteth initiative appears to have been the initial engagement with consumers; overcoming the initial resistance, then getting the dialogue going. The complexity of the UK electricity supply system means that the local, or distribution network operator (DNO), is not visible to the consumer (who are buying their power from all sorts of suppliers – there were 26 energy providers in 1,200 houses). Getting information out of the energy providers also seems to have been pretty challenging, in a regulatory environment where none of the companies are incentivised to talk to one another effectively.

The solution to making the consultation process work smoothly seems to have been identifying the key people in the informal community groupings within the area and working through them.



For every £1 on technology, 40p was spent on community engagement, illustrating the level of investment required in the intangible aspects of delivering sustainability.

The previous government recognised the fuel poverty issue through the creation of the Community Energy Saving Programme (CESP), which is an obligation on utilities and other large generators and is aimed at helping families in the 10% most deprived postcode areas to permanently cut their fuel bills. Stoke sought to get a project underway under the CESP initiative based on district heating. This seemed unlikely to succeed, simply because of the time and complexity of putting a district heating programme in place, as under CESP the money needs to be spent by 2012, reflecting the perennial challenge of grant based programmes where the key measure of success is getting the money out of the door within a given financial period; a good example of unintended public policy consequences where largely arbitrary deadlines drive commercial behaviour. As indicated above, CESP is time-limited and due to be replaced by a new programme (ECO).

While the role of communities in city sustainability initiatives is clearly of increasing importance, it also creates further complexity by feeding into a wider social agenda. The interaction between communities and local authorities, as well as other large corporate stakeholders (both public and private) is clearly at an early stage.

## Economic regeneration

Sustainability and economic development are inextricably linked in policy terms. In the world of austerity and the drive for economic recovery, this is likely to be accentuated for the foreseeable future. In other words, a close focus on the benefit to the local economy as well as overall value for money is an essential part of the sustainability agenda. This raises some major questions around investment priorities, and we talk about this later in the report.

Policies and strategies whose sole purpose is described as the reduction of CO<sub>2</sub> emissions are unlikely to secure adequate buy-in from businesses and communities. The concept is too intangible to the inhabitants of UK cities. One of the key levers to pull is to show the economic benefits that can flow from sustainability strategies.

That said, some voices have begun to question the drive for growth at all costs. Tim Jackson, in *Prosperity without Growth* says it is time to transition to a sustainable economy. He puts forward three broad sets of recommendations:

- establishing the limits
- fixing the economic model
- changing the social logic.

Within the concept of 'fixing the economic model' there is an investment case – in retrofitting buildings with energy and carbon saving measures; renewable energy technologies; redesigning utility networks; public transport infrastructures; public spaces; and ecosystem maintenance and

protection. It is not a case of reducing the level of economic activity, but doing things differently, and crucially with different timeframes in mind.

We see these themes showing in a changing mindset around what constitutes sustainable development in cities. Perhaps the concept of sustainable development is genuinely beginning to acquire some meaning. The economic argument is both about realigning the city infrastructure to meet future challenges and opportunities, and about securing a share of the economic opportunity from new and growth industries emerging from a transition to a low-carbon economy, as is illustrated by the three examples below.

While Birmingham's recently launched 40-year energy strategy for the city is linked to its ambitious CO<sub>2</sub> reduction strategy (60% by 2026), this is not the key driver for the strategy. Birmingham identifies three key risks for the city:

- consumers in Birmingham (business, public sector, residents, etc.) spend over £1.3 billion on gas and electrical energy every year
- the global energy sector is set for a major period of instability and unpredictability
- Birmingham's energy infrastructure was designed to supply the needs of a manufacturing city and is not appropriate for a twenty-first century Smart City.

While this strategy is at an early stage of development, it is remarkable in its scale of ambition and focus on the economic infrastructure needed for the city of the future.

In Bristol, as in many other cities, there are emerging networks and business/public sector communities designed to secure the economic opportunity. Bristol Environmental and Technology Services (BETS) is a trade association and sector partnership between businesses, academia, investors, local authorities, regional and national agencies promoting the growth of the environmental technologies and services sector in the Bristol city-region. Members include Hyder Consulting, Sustain, Wind Prospect, Burges Salmon, Bristol University and University of the West of England. The focus is on the economic opportunity created by the move to a low-carbon economy.

What is interesting and unusual in the Bristol context is the close link made by the council between climate change and energy security. A report entitled Peak Oil, developed by the Bristol Partnership and Bristol Green Capital, highlights the UK's dependence on cheap oil across all aspects of business and social activity.

The report seeks to put this issue in a Bristol context and look beyond peak oil to a world which is less dependent on hydrocarbons. The report comments on the implications for emergency planning, transport, food, healthcare, public services, businesses and utilities. It paints a number of post peak oil scenarios and concludes that options lie in a combination of reduced energy use and increased efficiency.

A more strategic approach to energy, heating and cooling for the city is needed, which effectively utilises waste heat, local biomass and develops renewable sources, with further engagement needed with communities to undertake retrofitting of homes and reduce energy and water

usage. The report recognises that there are different views on when peak oil is likely to occur, but implies it will be around 2020.

Importantly, the Peak Oil report places resilience and security of supply at the heart of the sustainability agenda.

Fife is widely seen as a leader for its integrated strategy for attracting low-carbon businesses to the region. In November 2009, Fife Council produced a report entitled: 'Growing Fife's Future – The Renewable Energy Opportunity', which clearly focuses on the economic development opportunities coming out of the sector. The highlights show the economic elements that are influencing policy potential, including:

- 2,000 jobs could be created in the sector and its supply chain
- specific supply chain opportunities such as offshore wind projects in the Firth of Forth and carbon capture and storage (CCS) at Longannet
- development of key infrastructure in order to support inward investment. This strategy includes:
  - the establishment of an 'Energy Park' at the former Kvaerner Yard at Methil, with 16ha of land available for development. The Council has primed the site through the completion of Phase 1 of site improvements. Phase 2, to repair the quayside, kicked off in March 2010. 1,000 jobs are the ultimate target for the Energy Park

- two proposed business parks; a Fife Renewables and Innovation Hub; and an Offshore Wind Training Centre
- private sector developments, including: papermaker Tullis Russell's plans to install a new £200 million biomass Combined Heat and Power (CHP) system (50MW) to replace its coal-fired boilers; Longannet CCS; and Diageo's Cameron Bridge distillery expansion to install a new £65 million power generation plant consisting of a biomass CHP system and an anaerobic digester.

In addition, The Scottish National Infrastructure Plan produced earlier last year by Scottish Enterprise identifies Energy Park Fife as a key potential site for offshore wind infrastructure investment. This was followed by the announcement in November 2010 of the £70 million National Renewables Infrastructure Fund aimed at Scottish ports.

Liverpool City Region has identified major infrastructure opportunities in the low-carbon sector. The Mersey Partnership (TMP) is heavily focused on economic regeneration with a low-carbon theme. There are major visible opportunities in the delivery of offshore projects, whether tidal or wind, and these are outlined further below. TMP is thinking carefully about the supply chain and the role that existing businesses can play in a low-carbon economy, having

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completed its own 'mini-Stern' review. In November 2010, TMP published a report setting out the case for Liverpool City Region becoming the west coast's major hub in development of the UK's offshore wind industry. The report, produced by Arup, is a detailed look at the region's existing port, manufacturing, warehousing and distribution assets, setting out how they can be combined to make a compelling case for the creation of a major supply chain to serve Rounds 2 & 3 Irish Sea Zone wind farm development. The developments proposed in this Zone alone are estimated to be worth £15 billion to the UK economy.

Probably longer term is a proposed tidal barrage being proposed by Peel (800MW capacity). The Stage 1 Options report was published in February 2010. There are inevitably major environmental issues with the project – whether as insurmountable as the Severn Barrage remains to be seen. At the time of writing, the Phase 2 Feasibility Study was scheduled for March 2011.



## Governance and stakeholders

At the moment, this is an area of high importance to UK sustainable cities, and considerable uncertainty. The Regional Development Agencies (RDAs) have been abolished, to be replaced to a certain degree by Local Enterprise Partnerships (LEPs). Local and regional structures are in a state of flux.

Nevertheless, among a number of our interviewees was a palpable sense of excitement at the opportunities that the changing landscape could present. A significant amount of energy and resources have to be devoted to creating governance structures that are both effective and inclusive, and if the new localisation agenda creates a more direct route to such structures, that is to be welcomed. Some of the governance structures that we have seen being created are described below.

The Bristol Partnership is the Local Strategic Partnership (LSP) for Bristol. It is a group of agencies or organisations from business, the public sector, community, voluntary sector, higher and further education, which are working together 'to make Bristol a successful city in Europe'. Bristol Partnership's executive partners are predominantly from the public, voluntary or higher education sectors.

The Partnership has an objective to 'make our prosperity sustainable'. This forms part of the Partnership's 20:20 plan, which has four primary objectives, of which 'sustainable prosperity' is one, designed to put Bristol in the top 20 European cities in 10 years.

It will be interesting to see how the Bristol Partnership interacts with the

West of England LEP, which was one of the first wave of 24 successful LEPs. Led by Bristol, Bath & NE Somerset, North Somerset and South Gloucestershire Councils, West of England intends to promote and support the key high-growth sectors of aerospace; creative industries; environmental industries, silicon and microelectronics; and tourism that are vital to the regions economy, as well as encouraging high levels of new business start-ups and the growth of small businesses.

The Sustainable Glasgow report launched in January 2010 was the product of a multi-faceted public/private partnership between the University of Strathclyde; Glasgow City Council; Scottish and Southern Energy (SSE); Source One Veolia; Blitzer Clancy & Company; and Scottish Enterprise. The report broke new ground in terms of the breadth of partnership supporting the report and in terms of its scope, which sought to map out the opportunities for low-carbon energy generation in the city.

Sustainable Glasgow is focused solely on the City of Glasgow rather than the wider city region. This was driven by practical considerations around the time it would take to get outlying areas to buy into the strategy.

The formal structure of Sustainable Glasgow is currently being put in place. The website says Sustainable Glasgow is taking action to make these proposals a reality:

- Creation of a high-level board that will take responsibility for delivering Sustainable Glasgow
- Drawing in additional partners
- Developing investment and business models
- Developing an energy masterplan for the city
- Integrating Sustainable Glasgow into public policies

There has been much thought around the form that the programme vehicle will take and the ownership or sponsor structure. There were concerns over the implications of the financial viability of the project vehicle and as such it has been agreed that it is key that Glasgow City Council will act as a key partner to bring this credibility.

In addition to the board the plan was to create a steering group which would consist of other key organisations such as SSE, ScottishPower and IBM, so the overall flavour is public sector led and private sector advised.

A lot of thought is clearly going into the form and structures required to deliver the Sustainable Glasgow programme. This is a common feature of many sustainability initiatives. While this is an important area, it is important to recognise that these are long-term programmes, which will evolve over time, often in unpredictable ways. So the watchwords for corporate structures should be simplicity, scalability and flexibility, wherever possible.

Following on the ‘mini-Stern Review’ in 2008, Manchester have driven the policy agenda forward, and their approach is a strong example of how city authorities can progressively put the policy blocks in place.

Policy documents have been produced in the following order:

**The Principles of Tackling Climate Change in Manchester** – In February 2008 the City Council approved 17 Principles of Tackling Climate Change in Manchester<sup>12</sup>, from which to develop a coherent action plan describing how Manchester will become a low-carbon city by 2020.

**Climate Change Call to Action**  
– Building on the commitments made in the Principles paper, the City Council approved the Climate Change Call to Action in January 2009. The Call to Action describes a new way of thinking about climate change, which fits in the context of the Community Strategy; describes how taking early action on climate change will make Manchester become a better place in which to live and work; and includes a specific commitment to produce a stakeholder

plan for tackling climate change across the city in advance of the UN Summit on Climate Change in Copenhagen in December 2009.

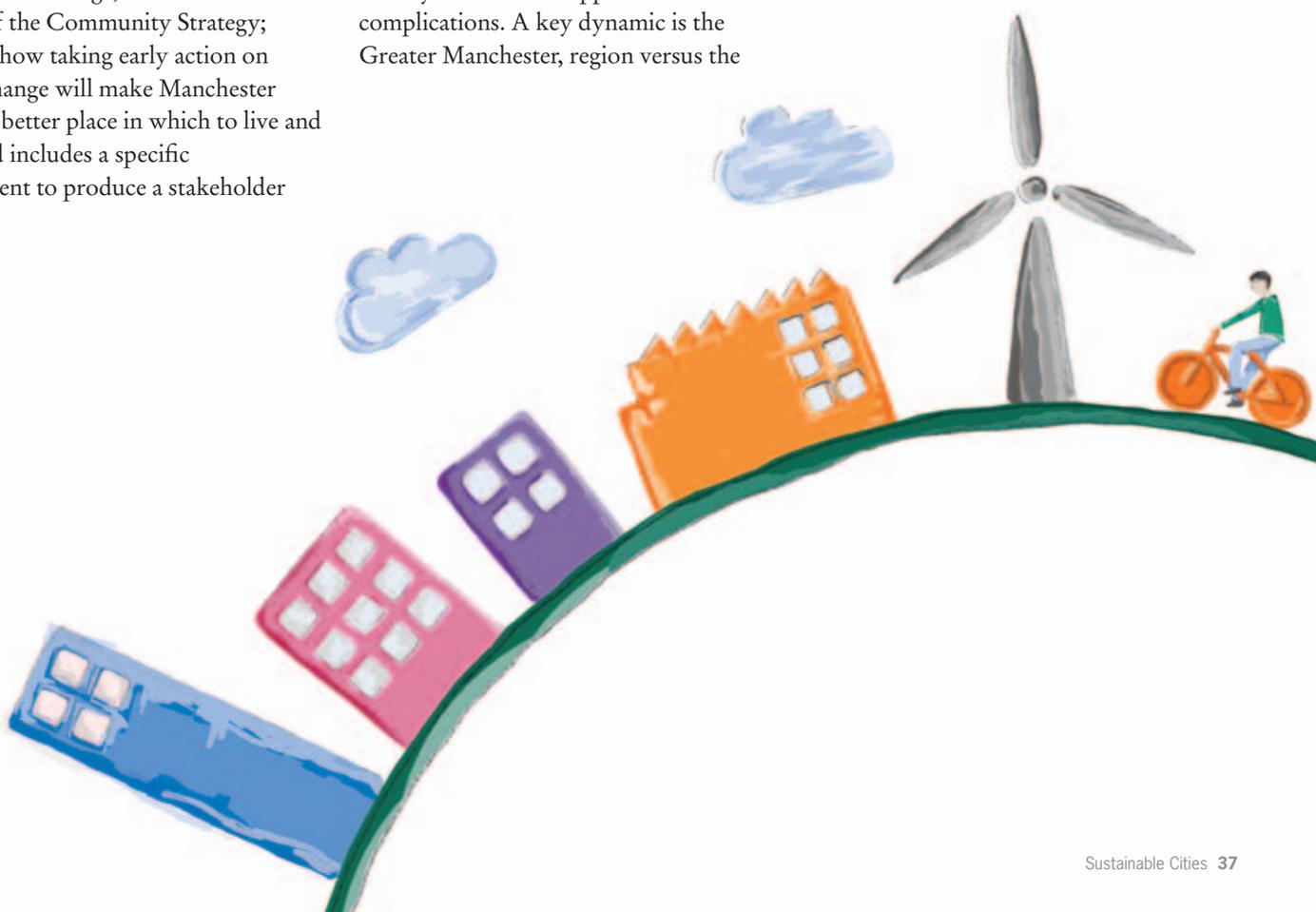
**Manchester’s Climate Change Action Plan** – Endorsed by the council’s Executive Committee in November 2009, the plan: ‘Manchester. A Certain Future’ sets out a strategic framework of actions that need to be taken by organisations and individuals throughout the city to address the challenges and opportunities of climate change between now and 2020. The actions aim collectively to substantially reduce the city’s emissions of CO<sub>2</sub> and to achieve a change in culture that enables residents, businesses and other organisations to take steps to adopt and implement the principles of a low-carbon economy.

Manchester have seen that working out governance models for climate change activity creates both opportunities and complications. A key dynamic is the Greater Manchester, region versus the

city of Manchester and within the city, the authority versus the place itself. Manchester City Council (MCC) was clear at the outset that this was to be a city plan rather than a council plan, and that it would put in place a governance structure to deliver implementation and create peer pressure and good practice.

The main players in Manchester are:

- the Council
- the two universities
- some big private sector players in the city centre (eg the Co-op)
- a vast array of SMEs
- the chamber of commerce
- the voluntary sector – mainly a small group of activists, but overall a very large group. Engaging with them is very important for the public face of the initiative. Also neighbourhood groups and social enterprises.



A sustainability programme for the city region is the ultimate goal. There is a clear view that the conurbation of Manchester and its hinterland is the sustainable entity, not the city itself. Progression towards a viable city region the long-term goal, but AGMA (Association of Greater Manchester Authorities) is still relatively young, the districts are all at different stages of development and there is a spectrum of political control.

Greater Manchester LEP was one of the successful first wave of 24 partnerships.

The Sheffield First Partnership (SFP) was formally recognised by government in February 2002 as the Local Strategic Partnership for the city of Sheffield.

Underneath it sits the Sheffield First Environmental Partnership, which is specifically focused on achieving environmental excellence in Sheffield and addressing action for climate change.

The Partnership faces a major challenge which arises from the UK legacy of infrastructure ownership and management. The view was expressed that the journey from centrally controlled infrastructure to breaking it up through deregulation has left the UK poorly placed to deal with the energy challenges that it now faces. The Core Cities network is a key body for addressing these challenges, but it is thought to lack powers to address these challenges.

The Sheffield view was that while cities have increasing responsibilities in this area, the right financial mechanisms are not yet in place to allow them to deliver.

Sheffield City Region was another successful LEP application. There are a number of interesting sustainability initiatives, including the vision for Dearne Valley, a former mining area, to become the first 'eco-park' in the UK, and a review of the economic inter-relationships between the five main cities in the North of England: Leeds, Liverpool, Manchester, Newcastle and Sheffield.

It is easy to generalise, but the UK seems to be faced with a high level of fragmentation in terms of the inter-relationships that exist between various stakeholder bodies, whether local, regional or national. A great deal of the governance activity in this space seems to be about putting pieces of the jigsaw back together. Perhaps we have more of a taste for experimentation in governance than some of our fellow Europeans. Greater Copenhagen, for example, has around 23 district authorities for a population of about 1.2 million, which on the face of it looks like a recipe for chaos; in fact, the picture appears anything but chaotic.

New structures created to deliver sustainability initiatives need to counteract, not compound, the complexity inherent in our governance structures.

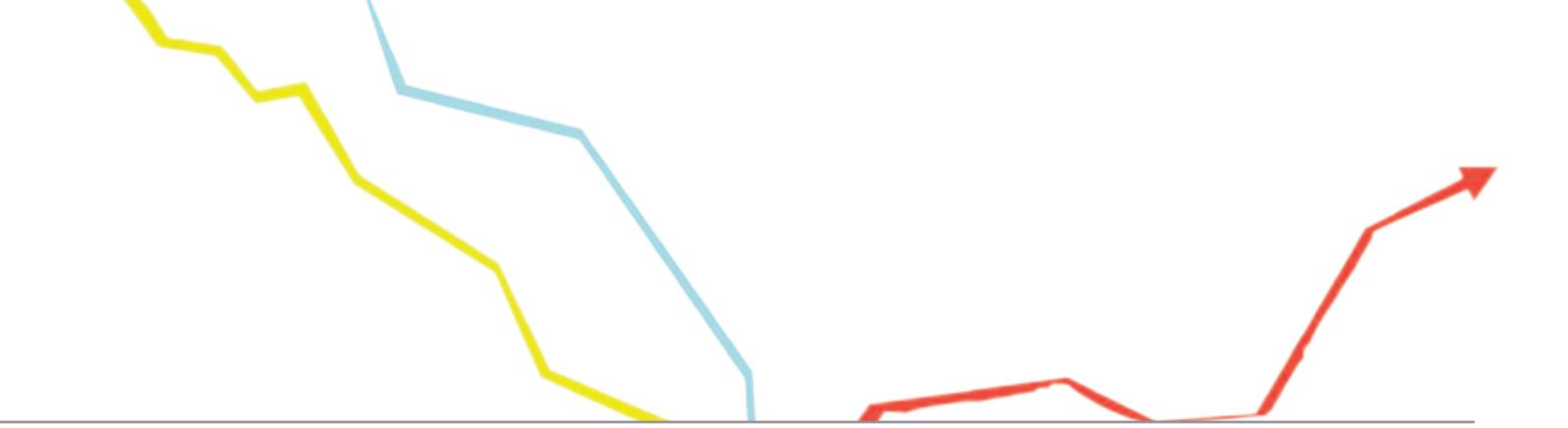
## Collaboration

This is a theme which is notable by its absence in much of the sustainability thinking across the UK at the present time. This linking could take many forms, such as:

- knowledge sharing on implementation of sustainability initiatives
- collective lobbying to secure more effective policy for sustainable cities at national and supranational level
- joint purchasing or procurement – eg of energy related contracts
- partnerships or joint ventures.

The Core Cities group might be seen as the first port of call to develop these links. However, the general view of our interviewees was that this group was relatively low key. Collaboration at a European level appears in the main to be a case of looking for best practice (for example, in district heating networks). At present, the instinct appears to be to compete rather than to collaborate.

This seems to be a missed opportunity, not only because of the shared industrial heritage which creates many similarities in the issues facing UK cities but also because the emerging tools for delivering sustainable cities, have much in common across all urban areas. The risk is that the sustainability 'wheel' will be invented several times over at a cost that does not reflect potential economies of scale.



Energy is a good example of an area which lends itself to collaborative working between cities. The three main elements of urban sustainable energy strategies at the moment are the same across all UK cities, namely:

- energy efficiency
- district heating
- feed-in tariff driven clean energy.

Retrofitting of energy saving or energy generating measures is clearly a vital element, given the high proportion of ageing building stock in all UK cities. These elements of city energy strategies may soon be joined by a fourth – the Renewable Heat Incentive.

The limitations on inter-city collaboration may not necessarily be limited to the UK. The sustainability team in Copenhagen, for instance, did not appear to see the Covenant of Mayors as a major force for addressing climate change.

On the other hand, there are some interesting examples of collaboration between cities in Germany, for example in the German metropolitan region of Hannover. The Regional Climate Protection Agency (Klimaschutz-agentur Region Hannover), which was established in 2001 by the Hannover City Council, the former regional association of local governments, the city's utility and various private partners, is in charge of co-ordinating all climate protection efforts throughout the region. It now consists of an extensive partnership of public and private bodies, with the city and the region together taking just over 50%, with a large number of other stakeholders, including E.ON, with a 9.8% stake.

In western Germany, eight towns near Münster with populations of between 10,000 and 25,000 joined forces to buy back their energy infrastructure from German energy giant RWE. In summer 2009, Olfen, Ascheberg Havixbeck, Billerbeck, Nordkirchen, Senden, Rosendahl and Lüdinghausen set up a joint, publicly owned electric utility company to take back the local power grid from RWE.

The regulatory regime in Germany appears to be much more favourable towards renewed municipal involvement than in the UK. In the next two years alone, roughly 2,000 licence agreements, with which many cities and municipalities put their energy and gas networks into the hands of private energy companies in the early 1990s, will expire.

Collaboration can operate at many levels. In some cases formal joint ventures may deliver synergies and purchasing power; in others, knowledge sharing will be a key driver.



While competition between cities is inevitable, smart cities will know where to compete and where to collaborate, and be capable of doing both.

## What works?

As we have said, the UK's cities are at an early stage of developing their sustainability strategies. Successful implementation of city-wide sustainability strategies is also rare – in Europe, at least. What we do have is a number of cities, particularly elsewhere in Northern Europe, which have successfully implemented city-wide district heating networks over a number of decades. These provide instructive examples, not least because of what they don't show, namely that:

- district heating networks evolve and grow over a long period of time
- there is no single public/private partnership model.

The examples are provided here.

## Copenhagen (mixed market approach)

Copenhagen's district heating networks date back to 1925.

There has been a transition from oil to mostly coal (with some gas), and now more renewable energy sources are being considered. This steady progression, rather than an instant leap, to renewable sources is important to keep in mind as some current district heating projects in the UK are trying to bypass the interim, fossil fuel stage of district heating.

There was a clear trigger point, which was the oil crisis in the 1970s. This had major repercussions through the Danish economy and society, and there was a political consensus that this should never happen again. In the UK, we have arguably come close a couple of times in recent years, but have never quite seen such a trigger point.

After the price spike in the 1970s, taxes made sure that the cost to the consumer of fossil fuels remained high, even if the underlying cost went down. Today it is estimated that a household sourcing its heat from the district heating network in Denmark is paying on average half that of a household using natural gas or oil.

The power plants supplying Copenhagen are Combined Heat and Power, and by law the heat has to be used, rather than dumped as is generally the case in the UK. Power stations that simply generate electricity are not allowed. The transmission companies then buy the heat from the power stations.

Thirty per cent of the heat demand in Copenhagen is covered by energy from waste.

The system has been supported by a system of energy taxes, but this is thought to have become too rigid and is acting as a block to further development. Now the push is on to decarbonise the fuel supply (currently 46% of the fuel supply is renewable – the targets are to get to 70% by 2025 and to be entirely fossil fuel free by 2040). There are proposals coming forward for tri-generation – ie coal, gas and biomass. This is what the new Copenhagen Heat Plan is about.

The power plants and the networks were both owned by municipally controlled companies, but the power plants were acquired by Vattenfall and DONG in 2006. CTR and VEKS, the transmission companies, remain municipally owned.

The value of the commercial deal which parcelled up the generating assets between DONG and Vattenfall was around DKr 20 billion (c.£2.5 billion), and was one of the biggest transactions in Danish corporate history.

Out of this has been created a mini-market, whereby, according to the accounts of the transmission companies (there is a day-to-day price-setting mechanism), profits on the sale of heat are capped but the generators must respond to the demands of the transmission companies. As the generating plant is CHP and can be switched between production of electricity or heat, there is an interesting tension here.

The transmission companies, CTR and VEKS, remain in municipal ownership and today are companies with substantial assets and cash balances, implying that district heating networks can be commercially viable, but crucially, within a favourable regulatory regime.

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## Helsinki (municipal ownership model)

District heating first started to be developed in Helsinki in 1953.

Now one of the largest energy companies in Finland, Helsingin Energia supplies electric energy to approximately 400,000 customers in Finland and covers more than 90% of the heat demand of the capital city with district heat. Helsingin Energia produces and sells district cooling from seawater, and is considerably expanding in Helsinki.

Among the services provided by Helsingin Energia are the design, projecting and maintenance of energy production and distribution systems.

Helsingin Energia is also responsible for the outdoor lighting systems in Helsinki.

The group's parent company is owned by the City of Helsinki. The Helsinki Energy Board became a municipal corporation and was renamed as Helsingin Energia.

In 2009 Helsingin Energia sold a total of 7,613 GWh of electricity, of which retail sales accounted for 3,747 GWh. Retail sales grew by approximately 5%. Total district heat sales amounted to 6,775 GWh, up by approximately 10% on the previous year due to the cold winter. District cooling sales stood at 57 GWh.



### Malmö (private sector model)

The city of Malmö is the third largest city in Sweden. Currently, there are approximately 290,000 inhabitants in Malmö, which has become the growth centre in the south of Sweden.

A critical component of Malmö's focus on energy efficiency can be found in its district heating system, which was originally constructed in 1951. First it contained smaller separate units that, over the years, merged together into one large-scale system. Gradually, as the city grew, the district energy distribution system followed a similar pattern and grew with it.

While originally owned by the municipality, in 1991 it was sold to the energy utility company, Sydkraft, which was later sold to E.ON. The private company E.ON currently maintains 100% ownership of the system. However, while privately owned, E.ON engages in close co-operation with the city of Malmö concerning extension of the system, planning, environmental considerations and so on.

In the year 2000, E.ON and the city of Malmö worked together to construct a unique district energy system comprised of '100% locally renewable energy' in the Bo01 area of Malmö's Western Harbour. This project is very much seen as a public private partnership.

The concept is premised on using local conditions for energy supply from renewable energy in the form of solar, wind and water. A large wind power generator of 2MW, placed in the Northern Harbour in Malmö, and 120m<sup>2</sup> solar cells on one building in the area, produce electricity for the housing and for the heat pumps, as well as for other pumps and fan installations used in the buildings for their use.

The main production plants for Malmö's district heating are industrial surplus heat, refuse incineration and CHP.

Malmö's district heating network is owned by E.ON Värme Sverige AB, a private energy utility company, owned 100% by E.ON Nordic.

## Conclusions

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The picture is one of a high level of commitment to the principles of sustainability among city authorities, emerging strategies and considerable resource devoted to mapping out the need or the shape of the problem, as well as to the governance structures required to build civic coherence, to 'reassemble the jigsaw'.

Not surprisingly, different authorities place a different emphasis on different sustainability themes. It would be interesting to analyse how citizens in each area are responding and whether they understand the intended message – if they are clear, in fact, what the message is.

We think there is unrealised value to be gained through collaboration and shared resources. Some EU programmes do this but tend to look to cross-border collaboration. Actually, the immediate task is much simpler: to achieve more effective collaboration within UK borders.

From looking at sustainable energy solutions, it is clear that there is no single governance model or public private partnership as a reference point. It is also clear that sustainable energy models evolve over a considerable period of time.

It seems to us that league tables or rankings between cities are of secondary importance. Each city is driving towards sustainable outcomes but each has a different legacy, different tools and different challenges.

It is also evident that prospective investment costs to implement sustainability agendas are high, and directly available funding sources are limited.

Finally, notwithstanding communication networks, the sense at the moment is that, by and large, UK cities are fighting their own battles in isolation.

# Green procurement and sustainable partnerships

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A key element of successful sustainability initiatives is the presence of effective relationships between the different levels (global, European, national, regional, city) and between the different stakeholders (community, business, consumer) at which initiatives operate.

These interactions are already happening in many places. However, ideas are not yet translating into projects at a scale or level of intensity for people and businesses to be convinced by their own eyes that we are on our way to low-carbon, low-resource cities.

Our view is that part of the problem in the UK is that policy and government resources are not yet effectively aligned with the role of cities in sustainable development. Models for public-private co-operation are in a state of evolution. Funding and policy mechanisms operate through a national filter which diffuses rather than focuses their impact on cities. Regional initiatives add another layer of governance, which diffuses the impact further, although this could now be about to change following the abolition of Regional Development Agencies.

Sector segmentation rather than locational focus has historically driven programmes of support and governance, as well as, in large measure, the private sector's service offerings. There are no established frameworks for public-private collaboration in sustainability as yet. The EU reaches towards a new role for cities and municipalities with the Covenant of Mayors, but this greater emphasis on cities is diluted by national and supranational interests, particularly in the energy sector.

We think that there are three key areas of policy development needed to move the sustainable cities agenda forward in the UK. These are set out below.

## Governance

It is clear that planning and implementing a sustainability strategy for a city is a long-term project. In this context, targets for 2020 are relatively near term. Where major infrastructure investment is needed (eg for district heating systems), these will need to move out of the feasibility phase into the active planning stage in the next couple of years to have an impact on 2020 targets. Birmingham is already planning for 2050, in recognition of this.

City-wide planning for sustainability needs bodies that are capable of representing the interests of key stakeholders, both public and private in the appropriate balance, and which are also robustly constituted to be independent of those stakeholders, with a primary focus on project delivery. Cities need to take a lead, rather than central government or the European Union driving the agenda.

We would suggest that the city authorities and business representatives should establish their own Infrastructure Investment Board (IIB), particularly in major cities. This needs to have a city-wide remit and locus. The primary purpose of this body would be to implement a sustainable infrastructure investment strategy to facilitate the integrated transition towards low-carbon, lower-resource infrastructure, with an emphasis on decentralised solutions where feasible. This could be promoted by Infrastructure UK and BIS or the Scottish Futures Trust in Scotland.

It is important that this body is both durable and has the stamp of the city as a place to it. Local businesses, perhaps through the chamber of commerce, need to be closely involved, as well as the local authority.

While Local Enterprise Partnerships may well be a step in this direction, at some point there will need to be resolution of their consultative and implementation roles.

Independence would be key, because the IIB needs to be capable of looking beyond the interests of the individual stakeholders, if necessary. For example, creating the right balance of ownership within the city's energy networks, or evaluating projects and programmes against a set of city-based sustainability criteria.

The IIB also needs to be capable of surviving a change of administration, while fully accountable and democratically responsive in its constitution, and of pursuing its agenda without policy interference while remaining transparent and accountable in its actions. The ongoing need for infrastructure would suggest a preference for a permanent body. Were it necessary to be constituted as a fixed-term body, the term would need to be of a sufficient duration to allow it to deliver its programme. We would say that should be a minimum of 10 years.

Different cities face different sustainability challenges. However, national government could identify a clear set of overarching drivers, as well as



guidance on ‘what good looks like’, to enable IIBs to drive forward in a common direction, share knowledge and facilitate other forms of collaboration.

The IIB should be the nexus of public and private sector know-how and complementary resources. This implies that it should be neither wholly privately nor publicly owned, and perhaps should adopt a third sector approach, such as that of a mutual or a public interest company. At the same time, commercial drivers cannot be ignored. They will ultimately drive efficiency through the process, as well as being the private sector’s key condition of engagement.

It may be appropriate to delegate or outsource component parts of the city’s infrastructure (either to the public or private sector), particularly once projects become operational, but the IIB should retain an overarching strategic role.

City authorities reading this will instantly recognise a major potential

obstacle to delivering an integrated sustainability strategy: namely that today’s city (including organisations primarily focused on the city, whether public or private) controls very little of the core infrastructure. The two principal exceptions to this – and these are not an exception in every city – are waste management and transport. As the Sustainable Glasgow report notes, virtually all of the city’s energy needs are imported via networks from outside the city. Water and sewage are dealt with more locally but controlled by companies with national or international interests, as are data and telecoms. Similarly, the local component of the food supply has dwindled in the face of dominance by supermarket chains with national distribution networks.

It was not always thus. As Tristram Hunt shows in *Building Jerusalem*, nineteenth century city authorities developed their own utilities, sometimes,

as in the case of Joseph Chamberlain’s Birmingham, buying out existing private sector utilities. The cost would have been too great for Birmingham ratepayers to bear, so the council borrowed to finance the acquisition and calculated, correctly, that the profitability of the venture would be more than adequate to cover the cost of debt service. Within five years of the acquisition, surplus funds were being applied to rates relief. As Hunt points out, Birmingham were not unique, or even trail-blazers – Manchester built a city gasworks as early as 1817, and Glasgow controlled its own water supply and there were some 49 municipal gas undertakings by 1870.

While the challenges of twenty-first century sustainability would be unrecognisable to nineteenth century aldermen, perhaps to some extent we need to look back to meet the challenges of the future.

## Sustainability champions of the nineteenth century – Joseph Chamberlain (Birmingham)

Joseph Chamberlain, as Mayor of Birmingham, elevated the practical challenge of developing a sustainable city into a kind of municipal evangelism. He believed that “all monopolies which are sustained by the State ought to be in the hands of the representatives of the people”. He was also a vigorous communicator, but his dandified style started to get on people’s nerves later in his career.

Chamberlain’s first foray was into gas, buying out and merging two rival private sector companies. In both cases their largest customer was the Town Council. Using a lower cost of municipal borrowing compared with private sector borrowing, Chamberlain worked out that after interest the council would make a profit of £14,800 per annum, rising to £50,000 per annum after 14 years, without increasing the cost of gas to the public.

He got his sums completely wrong. The first year’s profits were more than double his predictions and 10 years later the cost of gas had fallen by 30%, with surpluses being fed back into rate relief and a sinking fund.

## Finance

In their General Election manifestos, all the major parties identified a future Green Investment Bank as a means of assisting the UK economy to access the required sources of funding for low-carbon technologies and initiatives, which are recognised to be extensive in value – at least £100 billion over the next decade.

At the time of writing, it was not clear in detail what direction or shape the new Green Investment Bank will take, there were clear indications that the initial focus would be on large-scale infrastructure such as offshore wind, industrial waste, energy efficiency and high-speed transport links. There is a risk that the diverse patchwork of individually small-scale initiatives needed for sustainable cities will be overlooked.

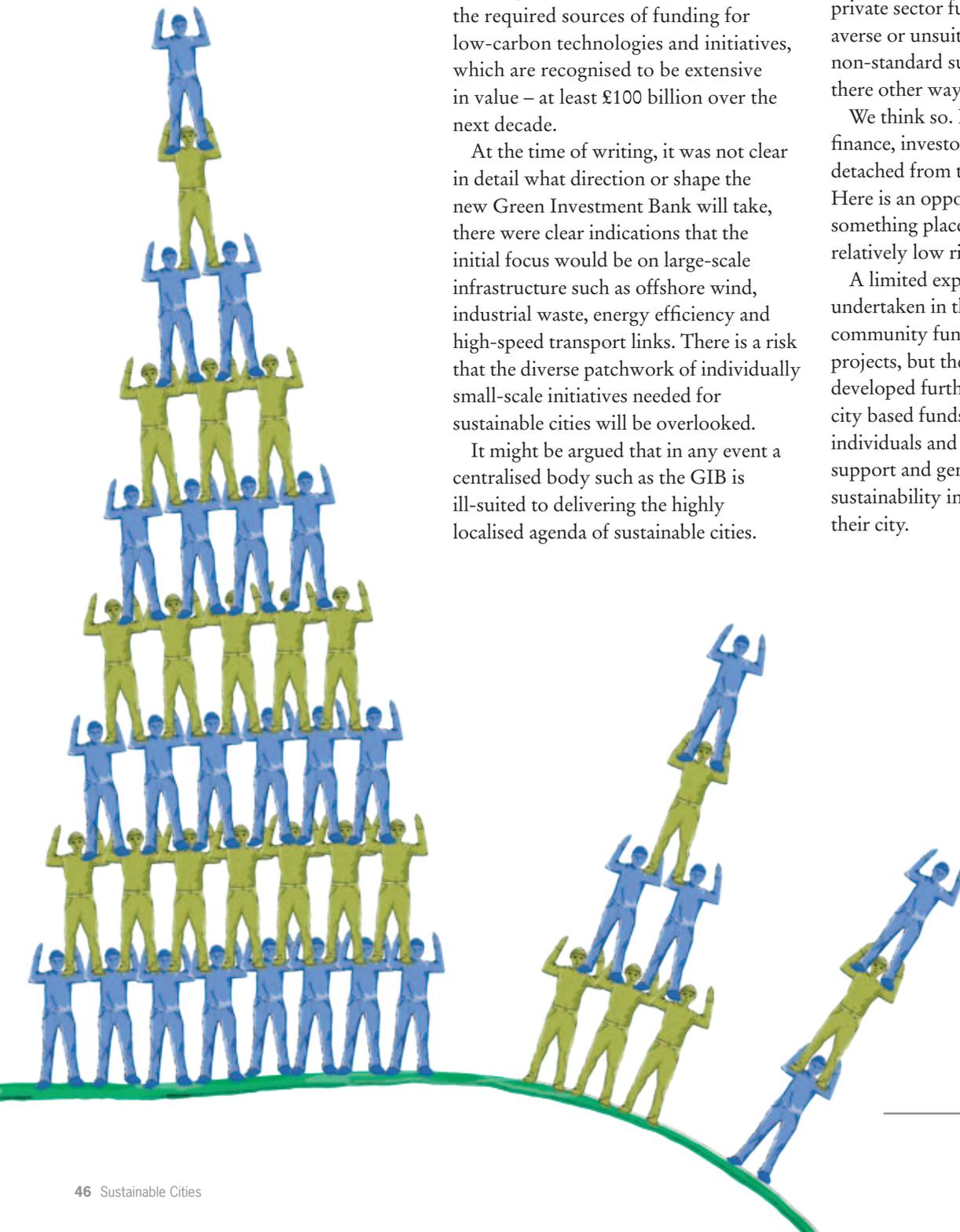
It might be argued that in any event a centralised body such as the GIB is ill-suited to delivering the highly localised agenda of sustainable cities.

Perhaps the best it can do is allocate funds to city-based bodies and thus devolve responsibility.

If current public sector funding sources for sustainability are inadequate, and private sector funding sources too risk averse or unsuited to a fragmented, non-standard sustainability landscape, are there other ways and means?

We think so. In the globalisation of finance, investors have become somewhat detached from their investments. Here is an opportunity to create something place-based, long-term and relatively low risk.

A limited experiment has been undertaken in this country with community funds for renewables projects, but the concept could be developed further with the creation of city based funds that allow businesses, individuals and the public sector to support and generate returns from sustainability investments made in their city.



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Such a fund, let's call it a City Investment Fund (CIF), could also act as a magnet for overseas investment. The range of financing instruments could be tailored to suit retail investors, communities, regional businesses or overseas funds. The CIF would have a sufficiently long life to enable it to work effectively as a partner to the IIB described above. It could provide finance itself through its own fund-raising activities or co-ordinate bespoke fund-raising activities for specific projects (eg a new district heating transmission network), as well as work alongside existing charitable bond issuers, such as Allia, which channel social investors towards charitable activities, including sustainability and social exclusion projects, while keeping investors' capital secure. This would enable it to support a mix of large and small projects. In a world of low yields, this could be an opportunity to connect both citizens and businesses with a strong local base, with a sustainable future and a predictable return.

The Green Investment Bank may well be ideally suited to oversee the governance principles and oversee these city funds, but it would be essential that the funds are embedded in the places they serve.

We think that the trick here is to get the right balance of standardisation (in order to create some recognisable products and structures), with a high level of devolved responsibility to the city or city region. At the moment cities in the UK are having to invest time and resources into devising their own funding structures, which could lead to duplication and delay.

What clearly needs to be avoided is the high level of bureaucratisation that has characterised national and European green initiatives in recent years. Retail investment of course adds an additional layer of complexity in terms of regulation and protection for investors, but is potentially worth the effort because of the high level of engagement it can potentially buy.

The system should be reliant on strong central government support to ensure that this could be put in place effectively, but without killing the momentum of the underlying programmes.

Some pump-priming from central government or the EU could start these funds (JESSICA is one example, but with limited scope). A CIF should be open to investment from retail and corporate players. The over-riding principles would be that the fund is city or city-region focused and embeds core principles of sustainability in its funding criteria.

There could be a limited range of recognised accredited funding instruments to provide a range of risks and returns, but without over-complicating the scene. Excessive structural complexity is something Western Europeans, and especially the British, seem to be particularly good at.

Potential funding instruments and approaches could include:

- investors (probably large corporates and institutions) would be invited to invest directly in the CIF which would then provide a mix of financing instruments, debt, equity or hybrids, to suit the underlying projects
- 'green city bonds', a debt instrument repayable from underlying project cashflows. Clearly work would need to be done to work out the covenant risk and recourse to secure the instrument
- 'city futures' – preference shares carrying a fixed coupon, generating a return which may not be stellar, but is nevertheless sufficiently interesting when aligned with broader sustainability interests, providing an interim risk position and potentially having charitable status;
- 'green infrastructure investments' – equity or quasi-equity instruments which take a share of the potential upsides and downsides of specific projects.

## Greening the Green Book

The principles on which public sector investment appraisal are based use analytical tools and make assumptions about the time, value of costs and benefits which are, in our view, ill-equipped to evaluate sustainability initiatives efficiently. Just as there is a compelling need to factor the principles of sustainability into historic financial information, we also need to do this for projected future investment proposals.

The 'bible' of public sector investment appraisal in the UK is the HM Treasury Green Book. The term 'Green' refers to the traditional colour of the front cover, rather than the content. The Green Book exists to ensure best practice in developing public sector projects, with the ultimate goal of delivering value for money to the public purse. It covers risk and project management and sets guidelines for desirable characteristics of projects. The Green Book is designed to look at projects generally over a maximum 30-year useful life. Compare this with the Victorian legacy of, say, Bazalgette's sewers, and this begins to look inadequate.

While there is a public policy driver in favour of sustainable, development and sub-components of this such as carbon reduction and energy efficiency, the financial principles on which the Green Book is based do not differentiate effectively between resource-heavy, unsustainable solutions and lighter-resource solutions. The Green Book relies on project sponsors to attribute differential risk values and project life cycle costs, but often within relatively short time periods (25-30 years at most) compared with the expected life of the asset and with a nil terminal value.

A discount rate of 3.5% is used as the 'social time preference rate'. This generates a net present value, which is in essence a means of equalising cashflows in present day terms. The rate steps down at year 30, but the message is the same – benefit today is worth more than benefit tomorrow. This is held to be universally true, whatever the project or its objectives. Discount rates drive investment decisions. A positive discount rate means we value things today more than in the future and the higher the discount rate, the more we value things today. In this context, it is interesting to compare two quite different approaches recently: The Committee on Climate Change in its May 2011 Renewable Energy Review, looking at cost ranges for low carbon technologies, uses 10% and 7.5%, while the sports company, Puma, in its Environmental Profit and Loss Account, uses a 'Pure Rate of Time Preference' of 0%, on the grounds that no generation should prioritise its welfare over another's.

We think that the Green Book needs to be explicitly 'greened'. Without this, sustainable elements of projects will continue to be seen primarily in terms of adding additional cost. Some of the ideas that could be considered include:

- crediting the project for meeting higher sustainability ratings, such as BREEAM ratings
- attributing a cost of carbon in projects (although it would have to be higher than current market prices to be a major differentiating factor). The carbon floor proposals in the current Energy Market Reform consultation make an interesting step in this direction – by targeting a carbon price of £70 per tonne of CO<sub>2</sub>, this gives a clear indication of the assumptions that should be made in public sector projects
- taking account of embedded carbon in development (thereby rebalancing in favour of refurbishment)
- adopting differential discount rates for sustainable solutions (thereby compensating for longer-term payback) or bringing the discount rate step-down forward for sustainable elements of the project (say to 10 years from 30)
- adopting a sustainability index factoring in higher expected future resource costs, particularly for elements such as life cycle costs.

Unless a significant financial impact flows from adopting high-carbon, high-resource solutions, procuring bodies will continue to opt for what appears to be the lowest-cost solution.

What this means is that short-termism is as much of an issue for public sector investment appraisal as it is for the private sector.

Further exploration of the issues involved in the option appraisal of publicly-sponsored sustainability projects is provided in the section headed Greening the Green Book at Appendix c.

## Conclusions

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A proactive approach needs to be taken to finding new forms of:

- governance
- finance
- investment appraisal.

It would be surprising if, to deliver sustainable city agendas, mechanisms from a fossil fuel world were fit for purpose.

A common theme is partnership between the public and private sectors – to manage delivery, raise the finance and develop the toolkit that helps us make the right investment decisions.



# The city of the future

We need a vision of the city of the future.

Without this the objectives of sustainable cities will seem ephemeral and elusive.

## Point of departure

Where we are now is the basis for the future. In most UK cities, the physical landscape stretches back over a century or more – hence the need for investment horizons that span generations.

We think there are some basic building blocks for the city of the future:

- Change will be evolutionary – a sustainable city in 2020 will be different from today and different again in 2050
- Although the sustainability characteristics embedded in current strategies are a best guess at how to achieve future resilience, the world will change and the unexpected will inevitably happen
- To become a successful City of the Future, it helps to be well positioned already, in today's terms. If you are a 'go to' city now, you have access to physical, intellectual and financial resources that will support the transition to a low-carbon economy
- The challenge of future sustainability is huge. Starting from an unsustainable base today is a bit like trying to play Premier League football with a League Two squad
- The city today is the basic building material available for the city of the future. This is not just about embedded carbon in the physical city, it is about embedded culture and the endowments that a city possesses
- What will change over the next few decades is the availability of resources and what we do with the waste outputs. So this is where sustainability strategies looking for major change in cities should focus. This could be an economic opportunity or a mitigation strategy – ideally both
- Technology is a vital ingredient. This is not just a matter of optimising physical assets – for example through smart metering, but the way the individual is interacting with his or her environment is changing with breathtaking speed. The resources of global corporations are being deployed to provide ever-increasing functionality and interactivity. Our cities will change as a result – of that there is no question. Will this lead to more efficient use of resources and lead us down the path of sustainability? Until the price signals of basic commodities become too strong to ignore, intelligent data and communications networks are 'sustainability agnostic', neither inherently a force for good nor evil – it depends how we use them.

Smart networks which contain positive feedback loops reinforcing certain types of behaviour ought to help the principles of sustainability gain traction for business and citizens.



## Four Pillars: **Social**

### Slum/Shack Dwellers International (SDI)

Is a confederation of country-level organisations of the urban poor from 28 countries of the Global South (as of September 2008). It was launched in 1996 and became a formally registered entity in 1999. Several well-developed national federations of community-based organisations of slum and shack dwellers – particularly in India, South Africa and Thailand – joined to found SDI.

Their mission is to link poor urban communities from cities across the South to transfer and adapt the successful mobilisation, advocacy, and problem solving strategies they develop in one location to other cities, countries and regions.

Since SDI is focused on the local needs of slum-dwellers, it has developed the traction to advance the common agenda of creating 'pro-poor' cities that integrate rather than marginalise the interests of slum-dwellers and counter the dominant urban development approaches that are in turn backed and financed by global agencies such as the World Bank, the IMF and the UN.

Why does this matter to cities of the developed world? Because people are increasingly realising that slum and shack dwelling communities in the developing world are finding innovative community-based solutions for sustainable living in highly resource-constrained circumstances.

### A vision of the future

We find ourselves standing in the centre of the city in 2050. What strikes us first is the balance between modes of transport – bikes everywhere, a new fleet of brightly painted, low-carbon public transport vehicles of different shapes and sizes. Private vehicles, while not entirely out of sight, are definitely in the minority. Petrol and diesel powered private cars are seen as more of a luxury – an aspirational item for occasional use in these days of high-cost fossil fuels.

With the reduction in private transport and the increase in electronic communications between all modes of transport (guidance on the ubiquitous and multi-purpose hand-helds for people travelling on foot, devices installed in bikes, buses, taxis and commercial vehicles), the volume of street furniture has dropped dramatically, giving the centre an uncluttered feel and showing off the architectural heritage of the city to its best advantage. Roadside allotments combine the aesthetic and the functional. The hard, symmetrical edges of the open plazas and squares so beloved of earlier decades are softened by a colourful and diverse bloom of vegetation, both on the buildings and between the pathways and roads, which is appreciated by the bird population as well as the humans, for whom the shade provides a welcome relief from the hotter summers.

From the limited but clear signage, we see that if we head for the largest of the city parks we can stop off at the new eco-power station, basically a high-tech descendant of the energy from waste CHP facilities at the turn of the century. This is only a couple of kilometres from the city centre. When the City Infrastructure Investment Board first launched the power station, there were high hopes of turning it into a major tourist attraction; this has yet to materialise and in truth perhaps a little too much was spent on trying to promote this side of its activity. The scars from the battle to get it built are still fresh – the citizens have long memories – and ultimately it did for the career of the first directly elected mayor of the city. However, now the fleet of small, waste methane-powered and electric collection vehicles which it powers, buzzing around the city centre, picking up on demand the carefully sorted rubbish from shops, residences and offices, are part of the landscape and a source of some pride. The public-private joint venture formed to create the ultra-responsive, short-journey collection service is now exporting the service to other cities.





As we walk westwards out of the centre along one of the main streets, we note the diversity of places to shop. All the big chains are still there, but as well as supplying their own goods, they play host to a wide variety of local enterprises, taking their cue from the growth of small businesses in French hypermarket complexes at the beginning of the century. What surprises is the amount of space dedicated to food, but with the progressive acceptance of fresh, unprocessed food into the diet of this admittedly rather conservative city, alongside greater personal mobility, obesity rates, while still a worry, have steadily dropped from their peak in 2025.

The big chains have adapted their own lines, finding that reengineering their supply chains to deal with the draconian anti-packaging laws has enabled them to offer greater local variety and higher added-value products.

With the steady improvement in solar electric technologies, solar panels on perpendicular surfaces as well as roofs are much in evidence, to the chagrin of many traditionalists, and city planners have had to take some bold and at times unpopular decisions to allow this form of energy generation to flourish. The development of a viable standard solar air-conditioning package by the multi-national 'SolarAirCon' is widely seen as a tipping point in the adoption of decentralised energy by commercial organisations. Apart from the greater flexibility provided by more effective forms of renewable energy storage, the application of solar to the use of air-conditioning is an ideal alignment in terms of the output and required time of usage.

The city still draws some of its power from the grid, but an expanding district heating network and building-based power solutions provide greater resilience and cost certainty for citizens and businesses.

We pass one of the main secondary schools, a flashpoint for the 'Climate Change Wars', of which the "What did you do in the fight against climate change, Dad?" campaign on YouTube became world famous. As the editor of the city-wide blog will tell you, the students teamed up with their counterparts at the local university and

narrowly missed out on forcing a majority of climate change activists onto the city council. The campaign galvanised the local political establishment and generally embarrassed the older generation into action. Of course, the ringleaders are the city's adopted sons and daughters these days, like Banksy in the old days.

Past the school, we see one of the many urban orchards that have emerged over the past fifteen years. This one is community-owned, although there are others owned by corporations. What has amazed the city authorities is the speed with which these have become associated with the regeneration of the city.

As the orchards have matured, their role as a key city amenity has become more widely recognised.

As we walk into the park, with this year's crop of artichokes swaying gently in the breeze, there she is – the first mayor of the city who had the vision to drive through the change and ultimately sacrifice her political career to build a sustainable future for the city. Well, you might not know at first sight that the sculpture is intended to be her, as representational sculpture is one thing that has not come back into fashion, but the small plaque on the plinth tells you all you need to know.



“In happier times, London would never have bothered with such feeble prey. The great Traction City had once spent its days hunting far bigger towns than this, ranging north as far as the edges of the Ice Waste and south to the shores of the Mediterranean. But lately prey of any kind had started to grow scarce, and some of the larger cities had begun to look hungrily at London. For ten years now it had been hiding from them, skulking in a damp, mountainous, western district which the Guild of Historians said had once been the island of Britain. For ten years it had eaten nothing but tiny farming towns and static settlements in those wet hills. Now, at last, the Lord Mayor had decided that the time was right to take his city back over the land-bridge into the Great Hunting Ground.”

Philip Reeve, *Mortal Engines*

# a. Sustainable city characteristics

Characteristic	What does it mean?	Connections	How could you achieve it?	Pillars of sustainability
Accessibility/ mobility	Major rebalancing of transport system in favour of public modes and/or pedestrians and bikes	Healthy population Attracts and retains investment	More public transport. Less private. Links to other sustainable cities. More physical mobility rather than vehicular	Economic
Attracts and retains investment	Destination city. 'Sticky places in slippery space' – people want to come here now. Make sure people will still want to come here in 50 years' time. City easy to 'read' – can people find their way around intuitively?	Business ownership Educated population Safe and secure Attracts and retains investment	Leadership role in key growth sectors – 'showcase' for sectors building on heritage. Cities to charge 'free users' (eg commuters, tourists) and reinvest to make a more sustainable place. Look at city design	Economic
Educated population	Better equipped to respond to challenges and take advantage of opportunities	Attracts and retains investment Uses resources efficiently	Invest in and orientate training and education towards a sustainable future. Strengthen integration of education system with other city activities	Social
Green spaces and biodiversity	Enhanced residential values. Well-being. Greater climate change resilience – copes with run-off, rising temperatures	Attracts and retains investment Healthy population Uses resources efficiently	Green grid. Protection of open spaces. Creative use of roofs, spare land, etc. Urban agriculture? Bees in Paris	Environmental
Healthy population	Lower cost to the economy, more resilient. Less strain on resources and services. Happier. Older. More productive	Attracts and retains investment Accessibility/mobility	Greater emphasis on public health. Working flexibility?	Social
Leadership	Joining the pieces. Address 'loose governance' – create a narrative and a vision for the city that is distinctive, challenging and not generic	All	Take long-term decisions outside political cycles. Need champions with powers. Remove blame culture	Institutional
Local 'ownership'	Greater resilience and more manageable exposure to external economic drivers. More locally-based incentives. Platform for future local growth and innovation. Stronger communities/districts within cities. Governance structures more visible and direct	Educated population Attracts and retains investment Leadership	Could come in a number of forms. Could be more of a 'mixed economy' in infrastructure ownership. Enhanced local engagement from multi-nationals. Creation of viable public-private partnerships. City and community based entrepreneurialism. Stronger role for chambers of commerce	Social
Resources	Less use of resources, including energy and water. Low GHG emissions. Find different ways of doing the same thing. Do different things	Safe and secure Local ownership	Transportation is key – of goods and people. Energy use is key. Embedded carbon is key (eg packaging, building materials). More closed loop recycling (of all resources)	Environmental
Safe and secure	Sense of community. Ability to manage everyday risks. Raise a family with confidence. Urban communities more empowered, more clearly defined and more pro-active	All	Safety for all. Community engagement (and ownership?) of projects. Security of resources (water, energy, food). Less JIT (Just in time). More diversity of sources?	Social

## b. Accounting for sustainability

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### Green sandals or greenbacks? Improving profits from sustainability reporting

Many private company entrepreneurs rightly view with suspicion the tidal wave of standards and regulation of the past decade, so much of which is aimed at the UK's largest public companies, but which seems still to impact on privately held business. However, I suggest they should be looking for value creation opportunities in the announcement on 2 August 2010 by HRH Prince of Wales Accounting for Sustainability Project that it had established the International Integrated Reporting Committee (IIRC).

The IIRC's remit is to create a globally accepted framework for accounting for sustainability, which brings together financial, environmental, social and governance information in a clear, concise, consistent and comparable format, painting a picture of an organization's total performance to meet the needs of the emerging, more sustainable, global economic model.

This sounds very worthy, but over lunch recently with a FTSE 100 chairman, and an unlikely 'tree-hugger', he made a convincing case why he and his business have invested so much effort in sustainability accounting: "It is all about economic return."

- Accessing investment – more and more investors look closely at the business's approach to ethical issues before investing, and that trend will increase dramatically
- Reducing costs – when the company introduced KPIs for the resources it was using up, it realised it was wasting cost as well as resources
- Attracting talent – few businesses will maximise financial return without attracting bright and committed people, and the war for talent will soon return.

Certainly Grant Thornton can relate to at least two of these cases. In an electronic environment, how many sheets of paper per person should a large accounting firm like ours use in a year – 100? 500? 1,000? When we looked, we were using 8,000 sheets of paper per employee. When multiplied by 4,500 employees that amounted to a shocking waste of money as well as resources. Just halving that usage (still a shocking waste) by introducing some simple KPIs increases profit per partner by around £2,000, and that is just a tiny part of our use of resources.

And in a services business, attracting high-calibre people is of course essential. When we track the reasons why bright young people join us, we do not get far before ethical issues such as environment, community and sustainability feature on their selection criteria for employers.

Accessing investment, reducing costs and attracting talent are every bit as important to value generation for privately held businesses as they are for the UK's largest public companies, and the beauty is that, with a little bit of guidance, most businesses could make great strides for little financial outlay.

Steve Maslin is Chair of Grant Thornton UK's Partnership Oversight Board and Member of the Accounting for Sustainability Project Working Group

## c. Greening the Green Book

### How does HM Treasury’s Green Book need to be adjusted to support sustainability objectives and the transition to a low-carbon economy?

The underlying proposition in this note is that the approach to investment appraisal in the Green Book risks inhibiting the development of sustainable procurement in the public sector, and in consequence the UK’s transition to a low-carbon economy.

This is not hard to explain. The Green Book dates back at least to 1991 and has steadily evolved ever since, remaining faithful to its core principles. Supporting investment in a low-carbon future, together with the need for resilience, resource management and security, was probably far from the minds of that generation of administrators, who were perhaps more concerned with defining the boundaries of the public sector and the rules of its engagement with the wider economy.

As a result, the Green Book rules are designed to reinforce existing investment behaviour and are embedded in historic strategies, placing a high value on precedent, evidence and established ways of working.

If the changes that are required to achieve a sustainable, low-carbon economy are as radical as government policy would have us believe, there is a major disconnect between high-level strategy which promulgates sustainability and a low-carbon transition, and the rules that the public sector is required to follow in assessing the benefits and thereby delivering it.

This is not intended to be a comprehensive review of the Green Book, but picks up issues in Sections 1-5, together with Annexes 1 and 2 (Government Intervention and Valuing Non-Market Impacts, respectively).

A number of suggestions are made in this paper. They are not intended to be cumulative in the sense that they come as a combined package. In fact, a number of them are likely to overlap in terms of the impact they have, and choices would need to be made about which approaches to adopt. The intention has been to provide a number of ideas for discussion deriving from the proposition that the Green Book may no longer be fit for purpose.

#### Overview – the Green Book

The Treasury Green Book is the cornerstone of project and programme appraisal and evaluation in the UK public sector. It provides clear guidance on how projects and programmes should be costed, appraised and evaluated, and how business cases should be developed to support the investment required. Although it is entitled Appraisal and Evaluation in Central Government, it has been widely adopted at all levels of governmental and public sector agency activity.

The Green Book states that the activities it covers are:

- Policy and programme development
- New or replacement capital projects
- Use or disposal of existing assets
- Specification of regulations
- Major procurement decisions

The guidance contained within the Green Book should be used both for planning purposes, and retrospectively in evaluating the outcomes from a project or programme.

While the Green Book recognises the need for environmental factors to be taken into account, our proposition is that the Green Book is not currently an effective mechanism for driving through sustainable, low-carbon projects and programmes, as the economic costs and the benefits of such projects are difficult to assess. Not only does it not explicitly support the government’s low-carbon agenda, but, worse, it represents a barrier to implementation of sustainable projects and programmes. There are two principal reasons for this:

1. The Green Book characterises these considerations as primarily 'environmental' in nature. This does not provide a sufficiently broad perspective on sustainability issues
2. Even if this over-arching concern did not exist, the Green Book does not provide any explicit mechanisms for favouring sustainable over non-sustainable projects and programme solutions. In principle it provides for project sponsors to factor in the cost of carbon, although:
  - there is currently no detailed guidance on this matter
  - the current market price would probably be an inadequate lever in any event, and
  - sustainability is not just about carbon costs.

While the principle of sustainability may be implicit in the considerations of long-term risks and life cycle costs, there is no specific direction on sustainable solutions. The supporting analysis for a project appraisal is therefore likely to be couched in today's terms, projecting forward on the basis of a steady evolution. There is certainly no recognition that a paradigm shift is needed towards low-carbon, resource-efficient development. This is in direct contradiction to strategic policy decisions that are being taken at national and supranational level.

The likely outcome from a typical Green Book project appraisal, therefore, is a default lowest current cost/minimum ascertainable risk' position. Perceived affordability is clearly a major driver in project appraisal, and project sponsors

will seek to strip out any avoidable cost that is not directly attributable to the specification that they are seeking to procure.

The process is also made more problematic by the emphasis on market-based comparators. The low-carbon sector is characterised by market failure in an objective sense; that is, the market is not currently geared up to meet the requirements of a low-carbon economy. This is self evident, as it is an emerging marketplace and policy landscape, and is also why such a huge amount of time and resource is being dedicated across the public and private sectors to bridge that gap. The standard Green Book policy approach will therefore attribute low values to benefits and high values to risks associated with low-carbon, low-resource solutions and the projected costs from adopting an 'as is' solution.

In addition, because the incentives and policy drivers that do exist to favour sustainable development are focused on areas that are often relatively marginal in terms of overall project cost (eg the energy component of large construction projects), they are not sufficient levers in themselves to re-orientate investment appraisal in a sustainable, low-carbon direction, while the sustainability issues that new projects and programmes raise have enormous future implications.

Finally, the underlying logic of the Green Book methodology, which adopts a relativistic approach and seeks to reduce all elements to a single common

denominator, means that avoidance strategies are always feasible, regardless of how strong the guidance to adopt the preferred low-carbon or low-resource strategy.

By way of example, a construction solution that achieves a lower BREEAM rating could well be adopted in preference to a more sustainable solution on cost grounds. This is a result of a combination of factors, including:

- a lack of a 'sustainability baseline'
- the relatively marginal role that carbon reduction and energy savings play in the overall cost analysis
- the inability of the established methodology to cater for an expected step change or paradigm shift in the future
- a lack of interest in or understanding of the long-term cumulative impact of the public sector adopting this kind of approach.

Put simply, a solution that is resource intensive but low cost in today's terms will in all likelihood remain the preferred option under the current investment appraisal methodology.

Clearly the public sector will wish to share the burden of transitioning to a low-carbon economy as far as possible with the private sector. However, unless it gives strong signals in its own procurement strategy, it can't expect to lead by example. Project sponsors and managers won't give strong signals in their procurements unless directed to by their own investment appraisal rules.

This paper comments on the areas in the current Green Book that raise particular issues and offers some initial ideas as to how investment appraisal methodologies could be re-examined to provide more favourable outcomes for sustainable options.

We recognise that revision of the Green Book would require detailed and extensive work, which does not fall within the scope of this note, but we hope that this will start the debate around much needed reform.

### What do we mean by sustainability?

As we have identified elsewhere, ‘sustainability’ is given different interpretations by different people. From a Green Book perspective, we think that the critical question is one of natural resources and how they are used. This clearly covers energy, but should also consider water and food, where applicable. Our proposition is that investment appraisal should favour lower or more efficient use of resources over higher or less efficient use of resources. A critical measure of resource usage is the level of waste output from these activities, including CO<sub>2</sub> emissions.

A change of mindset is needed, which sees resources, particularly finite resources, as not necessarily having an easily monetised replaceable value and not simply articulated as a financial cost expressed in today’s terms.

This approach would be consistent with a view of government as the ultimate guardian of these resources, rather than simply government as a buyer of services on behalf of its citizens. While the present cost comparison might suggest that it would be more expensive for government to invest in low-resources solutions today, the argument is that it will ultimately have to deal with and pay for current inefficiencies in resource utilisation.

We also believe that consideration should be given to establishing sustainability baselines in certain areas, or minimum requirements. These have already featured in policy terms such as the Code for Sustainable Homes or the Merton Rule, but these policies are market dependent and don’t go to the core of the public sector’s day-to-day procurement strategy. There should be a ‘sine qua non’ embedded in principles of investment appraisal – without which projects should not proceed. The benefits from these minimum requirements are taken as a given and should not need to be evaluated through quantitative analysis.

Some detailed commentary on particular sections of the Green Book is provided below, followed by concluding remarks. This is not intended to be a detailed review of the Green Book; rather, to create ideas for discussion and further work.

## Specific commentary

### Section 1 – Introduction and Background

The Green Book should explicitly set the context of the challenges that the UK faces in terms of future use of resources and the associated issues of climate change. This should set the context for all public sector investment appraisal.

The Introduction states that - the purpose of the Green Book is to ensure that no policy, programme or project is adopted without first having the answer to these questions:

- Are there better ways to achieve this objective?
- Are there better uses for these resources?

A third leg to this question should be added, namely:

- Does the project use resources as efficiently as possible?

The Introduction talks about how ‘economic, financial, social and environmental assessments’ should be combined. As indicated in our introduction, this fails to pinpoint the use of resources and waste outputs as key considerations.

A key problem is with how the Green Book is used – ie at the micro level to compare the costs and benefits of project options, but it is not used in any significant way to compare the costs/benefits of programmes, eg education investment as opposed to say, transport investment. This means that sustainability issues are not analysed in strategic terms.

## Section 2 – Overview of Appraisal and Evaluation

This is the section of the Green Book where cost-benefit analysis is first referred to. This would be the right place to establish some core first principles around the use of resources. This would then apply to the Option Appraisal.

We suggest that Use of Resources should be separately analysed within the Option Appraisal.

An established principle of the Option Appraisal is the Do Minimum option. At the present time, no consideration is given to the implicit benefits in terms of use of resources that arise from minimising the level of activity in the project. For example, in a standard public sector building project, no allowance in the Green Book analysis is made for embedded carbon in an existing development or conversely the carbon emitted through the process of demolishing the existing building and replacing it with a new one. Nor does it factor in supply chain emissions (or ‘scope 3’ emissions under the GHG protocol).

We suggest that the comparison of Base Case options with the Do Minimum should include an explicit analysis and recognition of the differential resource usage (or ‘negative usage’ in terms of embedded or ‘scope 3’ carbon emissions).

Under the heading Presenting the Results, Box 3 sets out a wide range of possible outputs of an economic appraisal or evaluation. It is effectively a list of contents listing out the business cases and various appraisals and assessments that could be produced. The implication is

that these are all optional. However, sustainability issues are potentially dealt with under:

- Environmental Appraisal
- Integrated Policy Appraisal (IPA)

The IPA is a catch-all but covers climate change, air quality, landscape, land use, waste, water, biodiversity and noise.

Clearly there is a risk of a lack of focus on the key sustainability issues with this format, and the risk that these issues get lost in the large number of documents and are easy to deprioritise or even discard altogether.

We suggest that sustainability issues should be valued as costs and benefits and a distinct Sustainability Appraisal be included as a non-optional component of the economic appraisal, and that a number of the others be merged, with clear supporting guidance.

Under Issues Relevant to Appraisal and Evaluation (2.25), some of these themes are repeated – there is a clear opportunity to embed the principles of sustainability in these issues.

## Section 4 – Setting Objectives

One of the key successes in public sector project management and procurement policy has been to embed the acronym SMART (Specific, Measurable, Achievable, Relevant and Time-bound) as a checklist against which to assess targets.

In fact, targets need to be SMARTER.

In other words:

- Specific
- Measurable
- Achievable
- Relevant
- Time-bound
- Environmentally positive
- Resource aware

## Section 5 – Appraising the Options

This section in the Green Book develops some of the ideas referred to in Section 2 of the Green Book, and discusses how options can be created and values estimated for the Base Case.

We suggest that in order to qualify as legitimate Base Case options, a quantified improvement in resource usage must be shown relative to the Do Minimum option.

## Valuing the Costs and Benefits of Options

The guidance stipulates that this exercise needs to be undertaken for all options, and the net benefits and costs calculated. In order to give a positive stimulus to low carbon appraisal, the Green Book will need to make a number of specific assumptions about the cost of non-sustainable options. Understandably, significant store is set by the level of confidence in the data provided.

The difficulty with the sustainability agenda is that there is a limited level of confidence because we are attempting to predict outcomes with no historical precedent. However, there are a number of reference points that give a point of departure for this work, such as:

- a range of scenarios for forward energy prices where government could give guidance about which scenario to use
- work around the costs and impact of a given rise in average global temperatures
- specific hotspots such as areas of greater flood risk, run-off issues. Sustainable Urban Drainage Solutions could, for example, be a 'sine qua non' as described above
- positive and negative development strategies
- resource-positive actions which have limited immediate commercial value, such as tree-planting
- the government's stated objective of setting a floor price for carbon (presumably at a level to stimulate greater low-carbon investment).

We suggest that specific baseline values for these elements should be factored into the analysis – for example as multipliers of costs or benefits. The argument may be countered that sustainability measurement methodologies are diverse, fluid and non-standardised at the present time. Our response would be that the government needs to take a preliminary view on these areas and be prepared to subject them to periodic review in order to show leadership in sustainability.

The subsequent costs and benefits sections should be subject to review and revision in this context. The established principle of determining benefits from market data should not apply in relation to the sustainability aspects of the project evaluation. Instead, government should develop a methodology specifically aimed

at recognising the expected long-term outcomes from the adoption or otherwise of sustainability principles. By the same token, the secondary principle of testing what consumers wish to pay may be inappropriate in a sustainability context.

### Distributional Analysis

The guidance then moves on to discuss the adjustment of values of costs and benefits. A core principle that requires review is the 'diminishing marginal utility of additional consumption'. There are a number of issues with this concept, which would require an extensive treatise to discuss. However, there is a key point here which goes to the heart of any sustainable development strategy, which is that investment decisions around low carbon and sustainable use of resources are determined not simply by the impact that would be felt in achieving these objectives, but also by how much social or economic benefit can be derived. In some cases, this may create conflicting objectives. For example, a city looking to decide in which particular district a pilot sustainability project should be implemented may have to choose between a wealthy, high-resource and carbon use area where the impact is likely to be most significant, or a deprived area which in objective terms is a lower consumer of resources and emitter of carbon but where the project there is seen to have some regenerative impact. This example could be characterised as a general issue about balancing 'market failure' against 'equity', but also illustrates a fundamental tension in sustainability investment, namely maximum impact may not be in areas perceived to be most needful of investment.

Distributional analysis is intended for social projects. The Green Book says that it is 'largely correlated with income' or about market failure. The Green Book is also not specific about how relevant factors should be prioritised against one another when they come into conflict.

Careful consideration needs to be given as to how sustainability factors and low carbon should be treated. Clearly care also needs to be taken to avoid a compounding effect of a number of different changes which might create a 'double count' of sustainability costs and benefits. However, one idea would be to create some kind of hierarchy which pinpoints more effectively when and how distributional factors should be taken into account.

### Discount Rate

Discounting is a key component of project evaluation. As has been shown in public-sector projects over the years, the discount rate applied to cashflows in the financial analysis has a major impact on their apparent financial viability. Where options with different cashflow profiles are being compared against one another, the level of discount rate that supposedly 'equalises' these cashflows in present day terms to derive a net present value can determine which option seems more desirable, and therefore affect the investment decision taken.

The discount rate approach follows standard corporate finance discounted cashflow principles, but in the Green Book is expressed as a social time preference rate (STPR). The STPR reflects that society 'prefers to receive goods and services sooner rather than later, and to defer costs to future generations'.



The question which then follows is this: is this focus on today's society still correct given the need for sustainability (and the importance of future generations)?

The rate has been fixed at 3.5% for some years, so unlike a corporate weighted average cost of capital (WACC), does not respond to changes in the cost of finance over time.

Prior to April 2003 the STPR was set at 6%. The process of transition to 3.5% from 6% which took place at the time is a useful counterpoint to an argument that the Green Book methodologies are objective and absolute. As an example, PFI projects should have been particularly sensitive to the change in discount rate in 2003, because the investment case required an alternative 'Public Sector Comparator', but in fact as far as we can see it made no appreciable difference to the rate of approvals for projects. There may have been some empirical evidence offered for the change at the time – it was argued to be 'unpacking' some of the 'risk' elements of the higher 6% rate, but those involved in project appraisal at the time will recognise that the supposed risk element could be seen as highly subjective.

When decisions are made between different options, the discount rate used to make the NPV comparison matters a great deal. A project which requires significant upfront investment but has a relatively long payback is likely to fare worse than one with a shorter payback or more limited upfront investment. In other words, investing for the long term gets penalised. Effectively what this says is, we don't care about the future. This is not a peculiarly public sector problem; the private sector investment community also suffers from this. However, without

some assistance, projects that plan for the next generation are barely going to get a second chance.

Interestingly, the Green Book does provide for a step-down in discount rates after Year 30, but the step-down is very gradual and cashflows after this period are likely to have a marginal impact on the overall NPV anyway, because they are so far in the future they are 'drowned out' by the earlier cashflows.

This principle could be adapted to enhance the NPV of sustainability benefits from different options by bringing forward the point at which a differential discount rate is applied – say after Year 10. By the same argument, the lower discount rate could also apply to sustainability 'disbenefits' eg the risk of flooding.

### Adjusting for Relative Price Changes

This section is about circumstances where the rate of price increase or decrease for a particular element (fuel costs and technology costs are cited) departs from average expected inflation. This might be seen as an opportunity to price in the expected impact of future resource constraints or potentially some kind of carbon inflator, but the difficulty for most project sponsors will be accessing sufficient up-to-date data to be able to perform this analysis with confidence.

Government could provide positive encouragement to make use of this section by specifying key areas where adjustments could be made. It would also need to provide baseline data or projections from which to work, while acknowledging that these will need to be periodically modified.

### Adjusting for Bias and Risks – Optimism Bias

Optimism bias is a reasonable observation that public sector project sponsors tend to underplay the risks and therefore the out-turn costs associated with projects. This common-sense statement evolved into a highly detailed analysis which arguably added complexity without clarity and left the process open to charges of spurious accuracy. Risk quantification remains an obscure art in public sector investment appraisal.

We would submit that unfamiliar solutions (as will be the case to a greater or lesser extent with sustainability and low-carbon solutions) will tend to be subject to 'pessimism bias', with benefits understated and costs if anything overstated. This will be exacerbated by a lack of performance data because often emerging technologies or solutions will be involved.

Clearly a careful line needs to be trodden here. Optimism bias is in part about trying to predict cost out-turns more accurately, and the cost risks associated with emerging technologies cannot simply be ignored. However, the process also values project options against one another, and perhaps these two purposes need to be seen as distinct and treated as such. One option would be to build in an element of 'sustainability risk' to options that do not demonstrate forward planning for resource use and carbon emissions.

#### Annex 1 – Government Intervention

Although this is an Annex, it is arguably the most important section of the Green Book, as it explains the rationale for government engaging in projects in the first place. Two reasons are identified:

- the achievement of economic objectives by addressing inefficiencies in the operation of markets and institutions
- the achievement of an equity objective, such as local or regional regeneration.

In other words, the rationale has to be about market failure or inequality. Nowhere is sustainability or the management of resources mentioned, although arguably these issues are likely to be hugely important areas of government intervention over the coming decades as it strives to reduce waste outputs, switch from finite to renewable resources and keep the lights on.

There is, quite simply, a major leg missing here.

#### Annex 2 – Valuing Non-Market Impacts

This Annex is central to the problem with the Green Book. If we look at Valuing Environmental Impacts in this Annex, the text in this section places the issue firmly in the too difficult box. Phrases such as no standard guidance, a complex science... is difficult, difficult to measure and complex, give a clear and none too positive assessment of the task facing anyone determined to take these factors into account. This sets the tone for the project appraisal.

While all of the foregoing may be true, the Green Book should be offering interim simplified methodologies that at least allow a recognition of these issues to be brought into the analysis.

#### Conclusions

The Green Book rests on an economic paradigm and a philosophy of government activity that lag behind the evolution of the key challenges – and opportunities – faced in the transition to a lower-resource, lower-waste – and therefore more sustainable economic model. The need for sustainable procurement in the public sector is well recognised, but without appraisal tools that fit the purpose, a transition to new ways of working is likely to take longer and, in the long run, prove more expensive, as poor decision making is likely to result.

The paper recognises that the task of realigning – greening the Green Book is a major one, but offers some ideas which might serve as starting points for this journey.

## d. Interviewees

Sandy Taylor, Head of Climate Change and Sustainability, Birmingham City Council

Richard Sharland, Head of Environmental Strategy, Manchester City Council

Keith Winter, Director of Economic Development, Fife Council

Richard Bellingham, Senior Research Fellow, Energy Policy, University of Strathclyde, Glasgow

Daniel Oliver, Sustainability Manager, Bristol City Council

Andy Nolan, Director of Sustainable Development, Sheffield City Council

Jane Forshaw, Head of Environmental Services, Stoke City Council

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