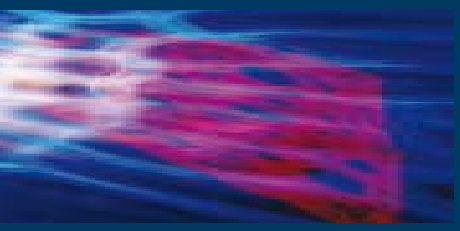
The Improvement Service

WORKBOOK

Sustainable development and the planning system

improvement service



Contents

1. Introduction

The planning system is a key area of policy and service delivery that can and must drive increased sustainability of our places, our resource use and our daily lives.

Buildings, infrastructure and land allocation impact significantly on our environment. They are directly and indirectly responsible for significant quantities of CO_2 and waste generation. Construction and operation of the built environment consumes high percentages of the world's timber, minerals and water supplies and utilises a heavy chemical load which directly impacts on our living environment.

However, buildings, places and landscapes reflect our cultural values, societal aspirations, priorities, successes and failures. The planning system, because it bridges the strategic, the practical, the past, present and future of these decisions and activities, has a significant influence on how well societies and planet will fare in the future.

Climate change, sustainability, sustainable development, energy efficiency, renewable energy and eco-buildings are interrelated terms and issues which are of increasing importance and profile within the planning system as well as society as a whole.

This workbook provides an explanation of the role of the planning system in promoting sustainable development and responding to climate change in the context of current legislation and policy. It covers why the planning system is important to sustainable development and what strategic and practical actions can be taken at the local level to build sustainable development into policies and decision making.

Participants will develop an understanding of how to apply sustainability thinking and tools to plans and applications. Participants will also gain insight into the commercial challenges faced by developers and how to help them deliver better outcomes consistent with local and central government aspirations for greater sustainability. Participants will also increase their understanding of changing stakeholder agendas and where benefits and efficiencies can be gained.

This workbook was created by Thirdwave in 2009 and has been updated by the Improvement Service in 2011.

2. Sustainable development and climate change

Climate change is a symptom, albeit highly pronounced, of our failure to develop and to act sustainably.

Overview of climate change

There is global scientific consensus that the dramatic rise in greenhouse gas concentration trapped in the earth atmosphere has already led to measurable increases in the average temperature of the Earth's surface. A rise of between 1.5 – 6 degrees above pre-industrial levels is anticipated by 2100 and many increasingly believe that at least a two degree rise is inevitable based on fossil fuel dependencies and the amount of carbon already in the system.

Even this seemingly small rise in average temperature is anticipated to have significant negative consequences. Increases in storms, drought and floods, rising sea levels and rising temperatures are predicted. Some species will become extinct, disease is expected to migrate and growing seasons will change.

Over the last 50 years Scotland's climate has got warmer, the temperatures have risen in every season and there has been an increase in heavy rainfall. Scotland will be increasingly affected by climate change in the future, with the trend seen over the last 50 years likely to intensify. A medium emissions scenario by 2050 would see a mean rise in both temperature and precipitation resulting in milder wetter winters and hotter drier summers (*UK Climate Projections,* UKCP09).

Sustainable development

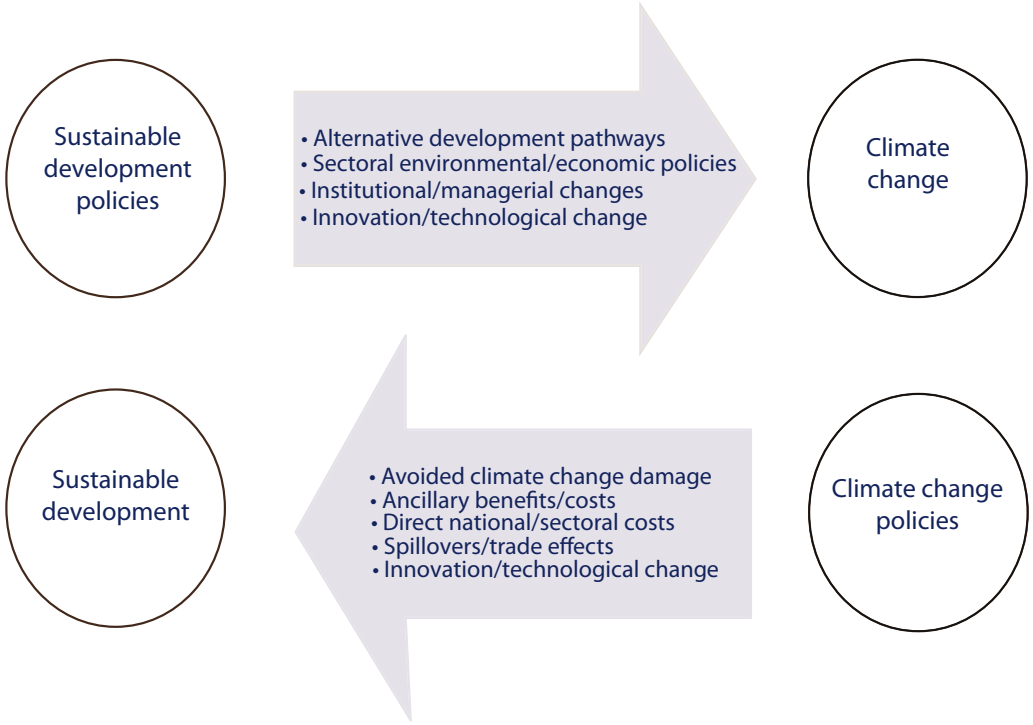
Sustainable development and climate change are often referred to together. In some circumstances, discussion about climate change has altogether replaced previous debate and attention to the broader concerns of sustainable development. While the issues are closely linked, it is essential to remember that they are not the same. Sustainable development addresses a wider range of environmental, social and economic needs while striving to maintain a balance between the three.

Climate change is not the only pressure in an increasingly unsustainable world. There is international scientific, increasingly political, academic and commercial consensus that human beings are using up the Earth's resources at an alarming rate. Further, the gap between those who benefit and those who do not has widened dramatically in recent decades and continues on this course. In a plentiful world many at home and many, many more abroad are without adequate nutrition, safety or security.

Addressing climate change and sustainable development – developing a positive cycle

Unsustainable development has driven much of the human race's contributions to climate

change but the responsible delivery of good climate change and sustainable development policies can be mutually reinforcing. The authors of the *IPCC 4th Report* dedicate a chapter to setting out useful thinking in this arena. The figure below succinctly captures core opportunities.



Two way linkages between climate and sustainable development. Source: Swart et al (2003)
Source: *IPCC 4th Assessment Report, Working Group II*, 2007 (www.ipcc.ch/ar4-wg2.htm)

While it is crucial to remember that this relationship is not exclusive of other influences in addressing either sustainable development or climate change, it is likely to gain exponentially in prominence as changes in the climate become more pronounced and threatening. Therefore, understanding this relationship and the virtuous cycle which can be established will be essential to policy makers.

The Planning etc. (Scotland) Act 2006 introduced a requirement that functions relating to the preparation of the *National Planning Framework* by Scottish Ministers and development plans by planning authorities must be exercised with the objective of contributing to sustainable development.

The Scottish Government's planning policies are set out in the *National Planning Framework 2* and *Scottish Planning Policy* (SPP). The principles of sustainable development are embedded in national planning policy.

3. Making sense of sustainable development

Applying sustainable development understanding and principles works to redress imbalances that lead to damaging cycles and outcomes such as climate change and social inequity.

This may be accomplished via recognising the limits of the Earth's carrying capacity while utilising the resources available, or acknowledging that ethical practice in business can encourage social well-being. In this way, sustainable development is perhaps better understood as a methodology for risk assessment, decision-making and value creation, rather than a subject. It is a process, an approach and it requires a different way of thinking in its application.

It is important to focus on the idea of the world being a 'system' and that sustainable development must work with this system and its subsystems. These natural systems maintain links across place (i.e. pollutants moving around the earth's oceans) and across time (intergeneration impacts of our choices today).

A deeper examination of systems and their importance to sustainable development will be covered in Chapter 6.

A working definition of sustainable development

The UK Sustainable Development Commission states that:

"Sustainable development represents a process and a framework for redefining social progress and redirecting our economies to enable all people to meet their basic needs and improve their quality of life, while ensuring that the natural systems, resources and diversity upon which they depend are maintained and enhanced both for their benefit and for that of future generations."

Key objectives of sustainable development

In practical terms, sustainable development centres on meeting three objectives simultaneously –social, economic and environmental.

The basic objectives of sustainable development are to:

- deliver social progress that recognises and also incorporates the needs of all, specifically socially excluded and disadvantaged groups, in order to build sustainable communities;
- maintain positive and stable levels of economic growth and employment in order to build a sustainable economy;
- reduce the consumption of energy, land, and other non-renewable resources and minimise the waste of materials, water, and other limited resources, and their related pollutants, in order to build a sustainable environment.

The critical idea underlying the concept of sustainable development is that these three key objectives are wholly interdependent. For example, there is now widespread recognition that over the long term, economic development simply cannot be sustained if its operations fail simultaneously to protect the environmental resource base upon which it ultimately depends.

There is also a growing recognition that society and economics are complicated human constructs, while the environment follows its own rules, systems and feedback loops, many of which we have only a limited understanding. The environment therefore, while at times flexible and resilient, is not essentially 'open to negotiation and reasoning' and we destabilise it at significant risk.

Principles of sustainable development

There is no single blueprint for delivering sustainable development. It requires different strategies in different communities and contexts. All strategies will depend on effective, participative institutions and systems of governance, engaging the interest, creativity and energy of all citizens in their application of the following principles.

The UK Sustainable Development Commission has drawn together five key principles (see overleaf) which need to inform the co-ordinated actions of government, business and community. These are endorsed and supported by the UK Government and all of the devolved administrations, including the Scottish Government. To deliver on any of these principles requires commitment and focus. To ensure sustainable outcomes, all five must be applied consistently and constantly.

Further principles that support delivering sustainable development

Other principles that support sustainable development are well established.

Precautionary Principle
The lack of scientific certainty should not be used as an excuse for failing to take action to avoid the risk of serious or irreversible environmental damage.

Equity Principle
Each person in the world has the right but not the obligation to use an equal amount of environmental space. Environmental space is the global total amount of environmental resources, such as absorption capacity, energy, non-renewable resources, agricultural land and forest that human kind can use without impairing the access of future generations to the same amount. The amount of space each person, community or country uses is often referred to as its environmental 'footprint'.

Proximity Principle
Environmental problems should be solved as near to their source as possible.

Polluter Pays Principle
The polluter should be primarily responsible for the environmental and economic effects of his or her polluting activities.

Learning from Ecology Principles

- Natural systems provide a model for thinking about how to produce, consume and live in sustainable cycles.
- Nature produces little or no waste.
- Nature relies on free and abundant energy from the sun.
- Nature uses resources very efficiently because there are so many diverse organisms with diverse needs.

Shared UK principles of sustainable development

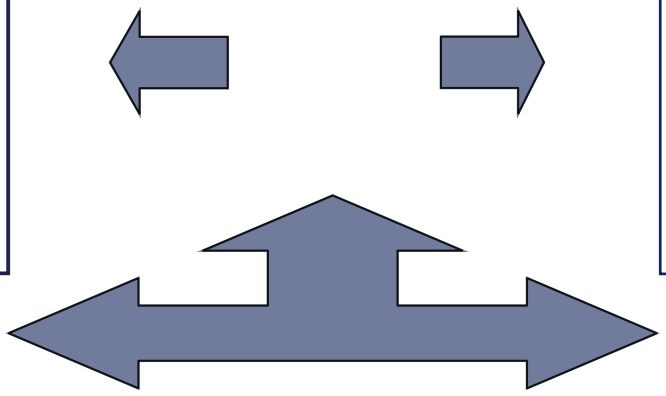
These are the shared UK principles of sustainable development. They apply to the UK Government, Scottish Government, Welsh Assembly Government and Northern Ireland Administration. For a policy to be sustainable, it must respect all five principles. We want to live within environmental limits and achieve a just society, and we will do so by means of sustainable economy, good governance and sound science.

Living within environmental limits

Respecting the limits of the planet's environment, resources and biodiversity - to improve our environment and ensure that the natural resources needed for life are unimpaired and remain so future generations.

Ensuring a strong, healthy and just society

Meeting the diverse needs of all people in existing and future communities, promoting personal well-being, social cohesion and inclusion, and creating equal opportunity for all.



Achieving a sustainable economy

Building a strong, stable and sustainable economy which provides prosperity and opportunities for all, and in which environmental and social costs fall on those who impose them (Polluter Pays) and efficient resource use is incentivised.

Using sound science responsibly

Ensuring policy is developed and implemented on the basis of strong scientific evidence, whilst taking into account scientific uncertainty (through the Precautionary Principle) as well as public attitudes and values.

Promoting good governance

Actively promoting effective, participative systems of governance in all levels of society - engaging people's creativity, energy and diversity.

Exercise 1: Principles of sustainable development

This exercise will help you envision what sustainable development goals need to be in tangible, local and relevant terms.

Describe what your planning authority would look like if it were to fully adopt sustainable development principles. What would be replicated or evolved, what would have to change, how quickly could it be achieved with a full commitment from all key stakeholders and the community?

Exercise 2: Sustainable development and planning

This exercise will help you define where sustainable development principles frame your activities and the scope for practical actions.

Identify how planning currently responds to each of the 10 principles listed above.

Identify how planning and planners could do better in the future.

What steps can you take within your role to integrate these principles more effectively in your day-to-day work?

Whose support would you require? How can you achieve this?

4. Why the planning system is important

The planning system represents a powerful force for delivering social, economic and environmental value to Scottish communities

The planning system enhances and sustains a community's quality of life. By informing forward planning, strategies and decisions with a solid understanding of sustainable development, it is increasingly demonstrated that better decisions can be reached in the short, medium and long term.

All of the points below have impacts which necessitate trade-offs and systematic planning if we are not to undermine the natural systems on which we depend and the social and economic systems we value:

- how we use land;
- how we shelter ourselves;
- how we work with the climate and micro-climate in development;
- how we travel and how much we need to;
- what energy we use, how much, from what resources, generated where;
- how we locate what we make and from what;
- which resources and materials we draw upon;
- in what contexts we work, relax, socialise, learn.

How and where buildings and infrastructure are developed can have positive and negative effects on communities and the economy as well as the environment. The process, and the product, of developing a building or resource can act as a catalyst for substantive improvement in the quality of life for a wide range of stakeholders if that opportunity is realised and harnessed.

This may take the form of sourcing and supporting local materials and workforce, sharing of expertise, strengthening fragile communities, generating low(er) carbon energy locally, reducing local impacts, increasing efficiencies and disseminating knowledge and models.

The process and outcome of delivering more sustainable assets is at the heart of qualitative place making — it is about the physical realisation of our values, relationships and priorities. It is about our physical interpretation of how we balance, integrate and optimise our:

- land and natural resource utilisation, expenditure and exploitation;
- societal needs;
- cultural values;
- historical sense of self and of community;
- economic engines, e.g. cities, resource excavation, infrastructure, energy, human operations, functionality of place.

The evolution of Scotland's places must also be understood within the context of the country as a whole. Our daily contact with and understanding of the natural world has also become

significantly reduced since industrialisation.

Planning society's spatial relationships and their development use, or indeed their protection from development, over time is central to answering the following questions:

- What is our relationship with our natural environment?
- What can we learn from it?
- What are our responsibilities?

Sites of Special Scientific Interest (SSSI), National Nature Reserves (NNR), Special Area Conservation (SAC), National Park, and other natural heritage designations all confer the inherent value our society recognises in Scotland's natural resources and an agreement to consider carefully any changes or impacts we might choose to make.

Buildings as villain, victim and white knight

While every person, privately and professionally, has much to contribute to sustainable development and responding to climate change, those operating within the planning system have significant opportunities and responsibilities.

In the early 1990s, as part of the Sustainable Development of the Built Environment: Road from Rio programme for the International Union of Architects, Professor Allan Rodger (formerly of University of Edinburgh) described the built environment as "the villain, the victim and the white knight of climate change and sustainable development".

Data published in recent years by sources as wide ranging as the UK Government, Munich Re Reinsurers, the IPCC and McKinsey & Company continues to substantiate this conviction. Buildings, particularly across the developed world, use enormous quantities of the Earth's resources:

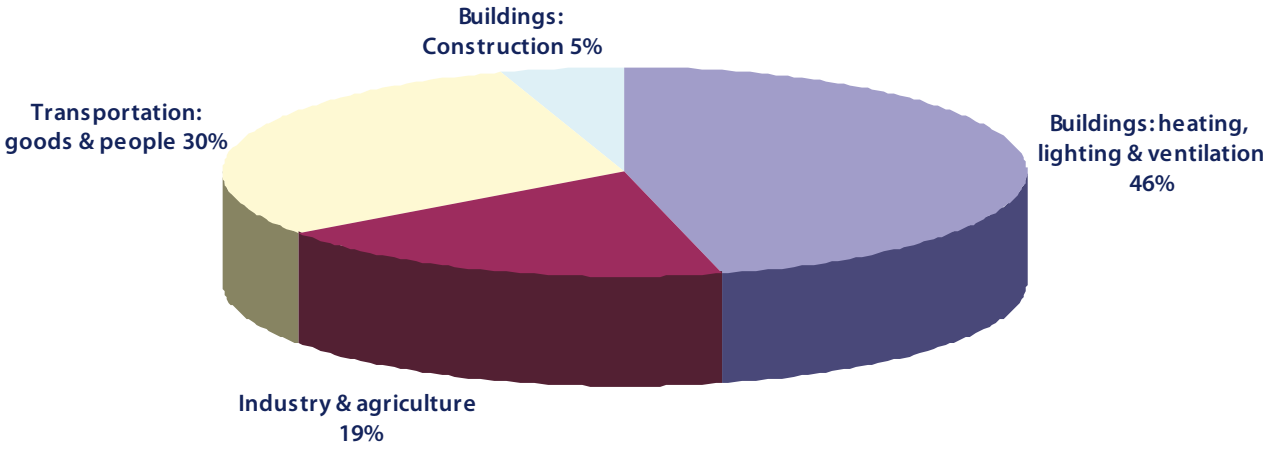
- The built environment accounts for 40% of the 7.5 billion tons of raw materials extracted annually.
- Buildings use 17% of global water withdrawals.
- 25% of the annual global wood harvest is used for construction.
- Buildings consume 40%- 50% of world energy production.

As previously noted, this consumption is simply not sustainable, and becomes even more daunting in the context of the exponential growth in construction taking place in developing countries. The energy usage is particularly staggering and has rightly placed the sector at the centre of climate change mitigation and energy efficiency discussions both in terms of low and zero carbon new build and the even greater challenge of improving the performance of existing stock.

If these figures establish the built environment as one of the leading villains of unsustainability, the graphic data from Munich Re which illustrates the costs of extreme weather events to the insurance industry alone reflects how the built environment is also the victim.

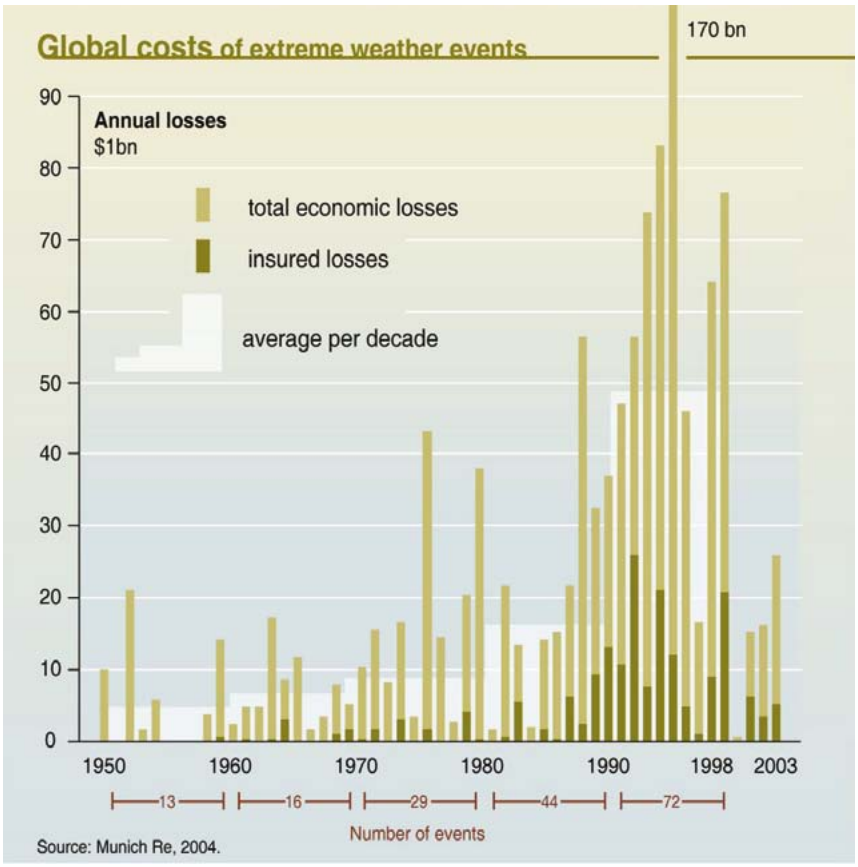
While not subdivided in this chart, buildings and infrastructure make up the predominant costs depicted and the plot shows how the sector and society dependent on it and the economy which ultimately pays for it, suffers as victim from increasing climate instability.

UK National Energy Consumption 2005 including buildings



Source: *Rough Guide to Sustainability*, 2nd edition; Edwards, Brian; 2005

Munich Re reports 2008 (following 2005 and 1995) as having the third highest losses on record: "This continues the long term trend we have been observing. Climate change has already started." (Torsten Jeworrek, member Munich Re's Board of Management)



If the built environment is both villain and victim, it also is a crucial white knight in addressing the substantive change required. Looking solely at emissions reductions, for example, the IPCC identified the built environment as perhaps the most important and opportunistic sector in which to reduce global emissions and to do so confidently and cost effectively.

The graph below illustrates the seven key global sectors which consume energy and estimates the number of gigatonnes of CO_2 that could be reduced per year by that sector at a cost of less than $20, $50 and $100 per tonne in future. These pricings may vary over time, but what is clear is the incredible potential for change and improvement within our built environment, as well as the many other sectors which are and can be impacted upon by strategic decisions.

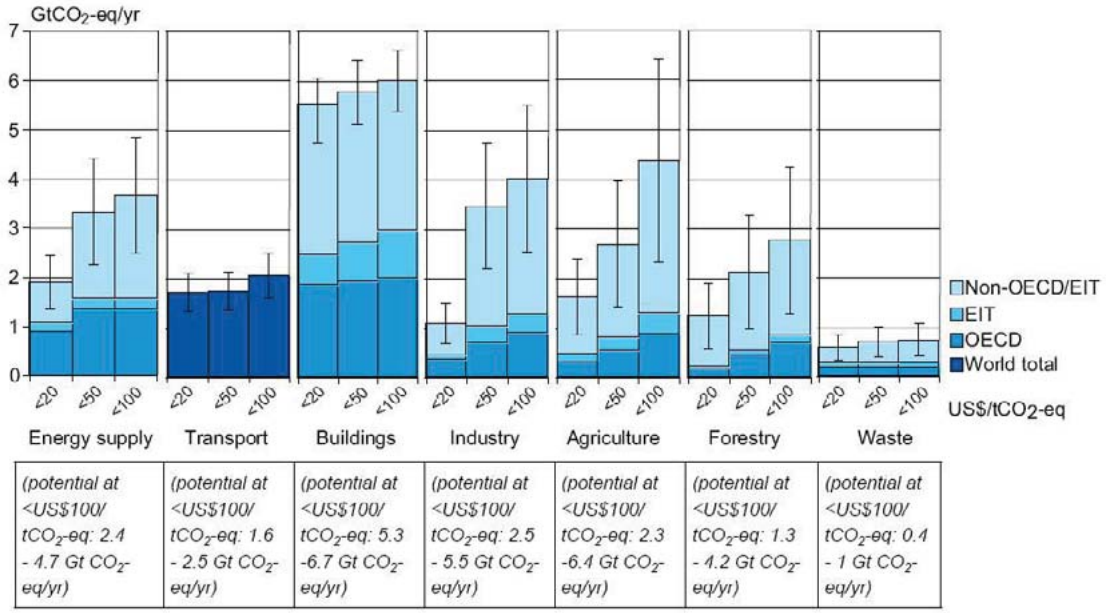


Figure SPM.6: *Estimated sectoral economic potential for global mitigation for different regions as a function of carbon price in 2030 from bottom-up studies, compared to the respective baselines assumed in the sector assessments. A full explanation of the derivation of this figure is found in Section 11.3.*

Notes:
1. The ranges for global economic potentials as assessed in each sector are shown by vertical lines. The ranges are based on end-use allocations of emissions, meaning that emissions of electricity use are counted towards the end-use sectors and not to the energy supply sector.
2. The estimated potentials have been constrained by the availability of studies particularly at high carbon price levels.
3. Sectors used different baselines. For industry the SRES B2 baseline was taken, for energy supply and transport the WEO 2004 baseline was used; the building sector is based on a baseline in between SRES B2 and A1B; for waste, SRES A1B driving forces were used to construct a waste specific baseline, agriculture and forestry used baselines that mostly used B2 driving forces.
4. Only global totals for transport are shown because international aviation is included [5.4].
5. Categories excluded are: non-CO_2 emissions in buildings and transport, part of material efficiency options, heat production and cogeneration in energy supply, heavy duty vehicles, shipping and high-occupancy passenger transport, most high-cost options for buildings, wastewater treatment, emission reduction from coal mines and gas pipelines, fluorinated gases from energy supply and transport. The underestimation of the total economic potential from these emissions is of the order of 10-15%.

A detailed explanation of these calculations can be found in the I*PCC 4th Report: Working Group III Report: Mitigation of Climate Change* and its summary.

The IPCC report further identifies effective intervention, both in terms of mitigation and adaptation, of direct importance to public sector planners or professionals operating in the development sector. Mitigation options identified are those technical solutions available now and those anticipated to be commercialised before 2030. Adaptation options address ongoing strategies and interventions, how they link to policy areas and both constraints and opportunities.

The full charts containing these assessments appear in the IPCC 4th Reports (see links below). The following excerpts from each chart should provide a sense of their value.

Table: Key mitigation technologies and practices by sector. Sectors and technologies are listed in no particular order. Non-technological practices, such as lifestyle changes, which are cross cutting, are not included in this table.		
Sector	**Key mitigation technologies and practices currently commercially available**	**Key mitigation technologies and practices projected to be commercialised before 2030**
Energy Supply (4.3, 4.4)	Improved supply and distribution efficiency; fuel switching from coal to gas; nuclear power; renewable heat and power (hydropower, solar, wind, geothermal and bioenergy); combined heat and power; early applications of Carbon Capture and Storage (CCS e.g. storage of removed CO_2 from natural gas).	CCS for gas; biomass and coal-fired electricity generating facilities; advanced nuclear power; advanced renewable energy, including tidal and waves energy, concentrating solar and solar PV.
Buildings (6.6)	Efficient lighting and day lighting; more efficient electrical appliances and heating and cooling devices; improved cook stoves; improved insulation; passive and active solar design for heating and cooling; alternative refrigeration fluids, recovery and recycle of fluorinated gases.	Integrated design of commercial buildings including technologies, such as intelligent meters that provide feedback and control, solar PV integrated in buildings.

Source: *IPPC 4th Report, Working Group III Report, Mitigation of Climate Change, Summary for Policy Makers* http://www.ipcc.ch/pdf/assessment-report/ar-wg3-spm.pdf

Table: Selected examples of planned adaptation by sector (Table 4.1)			
Sector	**Adaptation option/strategy**	**Underlying policy framework**	**Key constraints and opportunities to implementation**
Energy	Strengthening of overhead transmission and distribution infrastructure; underground cabling for utilities; energy efficiency; use of renewable sources; reduced dependence on single sources of energy.	National energy policies, regulations, and fiscal and financial incentives to encourage use of alternative sources; incorporating climate change in design standards.	Access to viable alternatives; financial and technological barriers; acceptance of new technologies. *Stimulation of new technologies; use of local resources.*
Infrastructure/ settlement (including coastal zones)	Relocation; seawalls and storm surge barriers; dune reinforcements; land acquisition and creation of marshlands/wetlands as buffer against sea level rise and flooding; protection of existing natural barriers.	Standards and regulations that integrate climate change considerations into design; land use policies; building codes; insurance.	Financial and technological barriers; availability of relocation space. *Integrated policies and management; synergies with sustainable development goals.*

Source: *IPCC 4th Report, Synthesis Report, Summary for Policy Makers* http://www.ipcc.ch/pdf/assessment-report/ar4/syr/ar4_syr_spm.pdf

Similar data, supplied by the International Energy Agency, is put into context by McKinsey & Company in their succinct and valuable report, *A Cost Curve for Greenhouse Gas Reduction* (2007). These findings are based on a similar cost curve McKinsey carried out for Swedish energy company Vattenfall AB on the potential cost of carbon abatement measures.

The model illustrates the relative emissions reduction and costs of a wide range of known abatement measures required to stabilise CO_2 at particular levels in the environment (550ppm, 450ppm, 400ppm) against a projection of business as usual activity by 2030.

The McKinsey report should be considered essential reading by all those contributing to new development and decision-making within the planning system. It further demonstrates the huge area of opportunity which the built environment offers to emissions reductions and the fact that these are predominately the most cost effective options available by massive margins.

Additionally, other 'big hitter' areas are subject to and guided by decisions within the planning system, such as renewable and low carbon energy generation, forestation and avoided deforestation.

According to the authors:

> *"If policy makers want to realise abatement measures in order of increasing cost, they must also find ways to effectively address opportunities in transport, buildings, forestry, and agriculture…Looking at specific measures, nearly one-quarter of the abatement potential at a cost of up to 40€ a ton involves efficiency-enhancing measures (mainly in the buildings and transportation sectors) that would reduce demand for energy and carry no net cost. The measures we include in this category do not require changes in lifestyle or reduced levels of comfort but would force policy makers to address existing market imperfections by aligning the incentives of companies and consumers."*

The models by the IPCC and McKinsey are just two examples of many becoming available that demonstrate the incredible importance of our built environment and infrastructure to addressing climate change and the need to move quickly toward sustainable development as a local, national and global priority.

These particular examples costed carbon potential against areas under planning control, but other studies map the cost of technical intervention to building stock against the cost of and/or benefits to human health and productivity, community safety and the local economy.

A further point is worth making – many of the changes or interventions highlighted appear predominately technical in nature. However, their success will depend on the support of a large number of players responsible for commissioning, designing, specifying, implementing, operating, and maintaining the built environment.

Throughout the reports noted above, and others like *Stern Review Report on the Economics of Climate Change* (The Stern Report, 2006), there is continued emphasis on the non-technical requirements for success – affecting political will, human nature, habit, education,

understanding, desire and apathy.

The planning process is, above all, about how and where human beings wish to live, interact and assemble. It is a process of negotiation between the individual and the many, what already exists and what is to come. Professional planners need skills for sustainable development that go beyond carbon projections and environmental scoring systems, valuable though they can be. They need to be able to engage with both the parts and the whole of the systems they address to both directly influence pattern change but also to bring a wide range of stakeholders with them.

5. Relevant activity within Scotland's local authorities

Contributing to Scotland's aspirations

Scotland's local authorities hold direct responsibility in contributing significantly to the country's national sustainability targets via specific commitments within the National Performance Framework as part of their Single Outcome Agreements (SOAs).

All the High Level Targets and National Outcomes are relevant to achieving a sustainable Scotland. However, explicit reference to responding to the climate change challenge and responsibility for ensuring that the natural and built environment are sustainable is made in several places in the National Performance Framework.

These valuable pledges build on a series of local authority commitments established in recent years that directly define and support the role of local authorities as key delivery bodies for sustainable development in Scotland.

Key policies and actions include:

- establishing Local Agenda 21;
- adopting and delivering Best Value;
- procuring resources and services sustainably;
- endorsing and delivering on Scotland's Climate Change Declaration;
- working within Community Planning Partnerships.

Implications for local government

If the promotion of sustainable communities and well being, including addressing climate change adaptation and mitigation, is seen as a core function of local government then there are clear related implications for local government's role and responsibilities.

Through Scotland's Climate Change Declaration, all of Scotland's local authorities have committed themselves to take action, in partnership with the Scottish Government, on climate change.

Furthermore, the Climate Change (Scotland) Act 2009 Part 4 places duties on all of local authorities relating to climate change. The duties require that local authorities must act to contribute to delivery of the Act's emissions reduction targets; to deliver any statutory adaptation programme and in a way that it considers most sustainable.

The planning service contributes and can contribute to much wider local authority sustainable development targets and opportunities, both directly and indirectly, through close working relationships with relevant colleagues and stakeholders.

Bob Hawkesworth, President of the Alberta Urban Municipalities Association in Canada offers this useful observation on what local authorities can bring to the challenge of sustainable development:

> *"Looking at the future, we can't help but conclude that we need to find a very different way of doing things. We need to be smarter about our use of resources and intelligent about the design of our communities…we need to 'future proof' them, to help our communities become more resilient."*

Embedding sustainable development into the process and into communities requires different thinking to take place:

> *"Municipal sustainability planning is more deliberate – it's about creating the future as opposed to being a passive recipient of what the future brings…Long-term planning for the future means you're much more in tune with the consequences of the choices that you make. Most planning processes envision more of the same…trends continuing into the future. A municipal sustainability plan starts from a different premise: that the future might be quite different from what we're experiencing now. We shouldn't assume the trends we're experiencing now will continue. The future will be affected by the choices we make today."*
> Municipal World, November 2007, www.msp.munilink.net

Exercise 3: Contributions by planning authorities

This exercise works through many opportunities for local authority leadership which hold direct and indirect roles for planning officers.

Review this list of how local authorities can deliver on sustainable development. Consider where planning officers could make direct or indirect contributions to delivering on each objective. Also consider what your planning skills and experience can enable you to offer to these objections, your colleagues contributions and your authority's aspirations.

In the context of PLANNING, local authorities should:

	Direct	Indirect	N/A
• pursue a strong theme of integrated natural resource management through national, regional and local activities to provide an effective context for sustainable spatial planning at the local level.	☐	☐	☐
• embrace more sustainable management of waste, efficient use of mineral resources, the management of soil in the context of agricultural change, the management of water including the minimisation of flood risk to people and property, habitats and biodiversity.	☐	☐	☐
• continue to develop and apply more widely, tools such as sustainability appraisals, comprehensive project appraisals in formulating plans and options for development with developers.	☐	☐	☐

List key opportunities for the planning service.

In the context of CLIMATE CHANGE, local authorities should:

	Direct	Indirect	N/A
• formally acknowledge the direct and indirect impacts on climate change of their policies and actions on transport, housing, planning, environmental regulation, education and awareness raising within community strategies.	☐	☐	☐
• measure and manage their own 'in-house' greenhouse gas emissions.	☐	☐	☐
• assess the potential impact of climate change on their local area, and the implications for the local authority and its partners.	☐	☐	☐

List key opportunities for the planning service.

In the context of WASTE, local authorities should:

	Direct	Indirect	N/A
• focus activity more on waste reduction, making it a priority at the top if the waste hierarchy and work in partnership with local communities and businesses on initiatives to achieve waste reduction.	☐	☐	☐
• promote the economic, social and environmental benefits of recycling and work to encourage greater procurement of recovered materials and recycled goods.	☐	☐	☐
• seek to improve the health and well-being of people through better planning and managing of waste and by reducing waste-related pollution.	☐	☐	☐

List key opportunities for the planning service.

In the context of providing LEADERSHIP to their communities, local authorities should:

	Direct	Indirect	N/A
• when making decisions, take into account the needs of future generations was well as being responsive to immediate concerns.	☐	☐	☐
• identify and empower the socially excluded.	☐	☐	☐
• act to improve health and tackle health inequalities.	☐	☐	☐
• demonstrate fair, open, transparent and participatory processes.	☐	☐	☐
• champion the 'public interest' in raising awareness and mobilising action to curb unsustainable trends, for example in consumption and production.	☐	☐	☐
• acknowledge the increasing importance of procurement and develop approaches to this and local employment that meet the principles of sustainable development.	☐	☐	☐
• recognise the broader, global impact of local decision on both the environment and on people, such as climate change and biodiversity.	☐	☐	☐
• explore innovative local solutions in getting to the hardest to reach groups into work and improve the wellbeing of the most deprived communities.	☐	☐	☐
• use their procurement activity to support social and community enterprises and to recycle funding in the local economy.	☐	☐	☐
• maximise the role of tourism to protect and enhance the environment by working with communities, visitors and the industry, to pursue sustainable tourism policies.	☐	☐	☐

List the key opportunities for the planning service.

In the context of LEARNING, local authorities should:

	Direct	Indirect	N/A
• work with partners to improve skills and educational attainment.	☐	☐	☐
• facilitate local economic diversification.	☐	☐	☐
• take account of the needs of urban and rural areas and the links between them.	☐	☐	☐

List key opportunities for the planning service

In the context of HOUSING, local authorities should:

	Direct	Indirect	N/A
• recognise their strategic housing role, regardless of tenure social care, health education and community safety.	☐	☐	☐
• develop closer working between housing and other functions such as housing.	☐	☐	☐
• improve the delivery of housing benefit.	☐	☐	☐

List key opportunities for the planning service.

In the context of TRANSPORT, local authorities should:

	Direct	Indirect	N/A
• acknowledge as large employers the consequences of internal transport policies, for example green travel plans for members of staff and visitors.	☐	☐	☐
• acknowledge the cumulative sustainability consequences of local transport policy decisions on the wider environment.	☐	☐	☐
• strive to contribute towards national sustainability and inclusiveness targets.	☐	☐	☐
• ensure that interim local and national outcome targets are being met.	☐	☐	☐

List key opportunities for the planning service.

In the context of HEALTH, local authorities should:

	Direct	Indirect	N/A
• develop effective partnerships between social care and health to set local priorities for health improvement and tackling health inequalities.	☐	☐	☐
• recognise the role of a whole service approach to improving health transport, environmental health, leisure and education through coordinating and rationalising strategic priorities and plans.	☐	☐	☐
• encourage joint training across local councils to tackle health inequalities.	☐	☐	☐

List key opportunities for the planning service.

Exercise 4: Implications for the planning service in your authority

This exercise examines the full range of inputs and value planners can bring to addressing sustainable development and climate change within local authorities.

What do planners have to offer?

What opportunities within development planning and development management contribute to the broader sustainable development and climate change objectives of local authorities?

Do planners get asked to participate at the right time on development thinking that leads to the formation of policies, initiatives and strategies? What would you consider the 'right time' for contribution?

What are opportunities missed and how can this be corrected?

Do planners in your authority see themselves as being entitle to take up these issues?

☐ YES ☐ NO

If not, why not and does someone else address these issues adequately or do they get missed?

6. Resources for supporting assessment and decision making

Sustainable development is about linkages — any choice will have social, economic and environmental considerations and consequences, some predictable, some less so.

Systems Thinking

Systems Thinking can be a very useful, potentially essential, tool in applying sustainable development principles to decision-making. It is not an abstract or academic concept and has been used by business and industry for many years. Systems Thinking is valuable in recognising and understanding the interrelationships and processes that underpin our natural world and much of our constructed world.

Simply put, a system is:

- a set of components that interact with each other;
- something that maintains its existence and functions as a whole through the interaction of its parts;
- a whole whose parts relate because they continually affect each other over time and operate toward a common purpose.

Examples of Systems:

- biological organisms
- the atmosphere
- diseases
- water courses
- factories
- chemical reactions
- political entities
- communities
- industries
- families
- teams
- ecosystems

Systems Thinking is the key to understanding the interconnections between the complex, multi-faceted problems of sustainable development. It involves placing as much emphasis on identifying and describing the connections between objects and events as on describing the objects and events themselves.

Taking a whole systems view when considering the introduction of an urban green space or an integrated transport scheme depends on including all the factors involved and examining how they relate to each other and how they work as a whole. Only then will the secondary subsequent ensuing consequent effects be visible, considered, valued, and accommodated.

Don't we do this already?

Most professionals use some aspects of Systems Thinking already. However, when dealing with sustainable development issues a more highly developed and consistent application of Systems Thinking is useful.

More often than not, traditional western thought, education and culture favour linear, analytical thinking. We break tasks, problems and objects into their smaller and smaller component parts to determine how they work and how they can be changed. This is the basis of most scientific research and is infused in our society. This approach certainly has benefits, but also limitations as natural, social and human systems don't necessarily follow these rules.

A system, as identified on the previous page, whether it is an ecosystem, a family or a floodplain, doesn't exist as component parts. It is the way the component parts interact that creates their identity and their value.

Rusell Askoff, architect, city planner and operations researcher, noted:

> *"When you try to explain a system using analysis, the first step is, you take it apart, and of course it loses all of its characteristics. You cannot examine a system by looking at its parts; you must look at it as a part of a larger whole. So analysis, we discovered, yields information about the structure of something, and how it works, that's knowledge, know how. Explanations lie outside, that's Systems Thinking. Synthesis yields understanding, analysis yields knowledge, and it was that distinction that was critical."*
> http://www.open2.net/moneyandmanagement/management_organisation/systems/practice/ackoff.html

Askoff identified a further limitation in favouring or tending toward analytical thinking in that it is often quantitative:

> *"Most of the problems of large systems, strategic problems, organisational problems, do not involve quantities, they involve qualities. So a self-aware balance between Systems Thinking and analytical thinking is essential in addressing these types of challenges, from organisational growth to developing strategic planning models and mechanisms."*

To sum up — Systems Thinking requires shifts in perception from:

- parts to whole;
- objects to relationships;
- objective knowledge to contextual knowledge;
- quantity to quality;
- structure to process;
- contents to patterns.

(Source: Centre for Ecoliteracy www.ecoliteracy.org/education/sys-thinking.html)

ANALYTICAL THINKING		SYSTEMS THINKING
Parts	⇔	Whole
Objects	⇔	Relationships
Objective knowledge	⇔	Contextual knowledge
Quantity	⇔	Quality
Structure	⇔	Process
Contents	⇔	Patterns

Relevance of Systems Thinking to the planning system

The planning system, more than many other disciplines, requires an ability to work equally between analytical and Systems Thinking. The 12 elements of analytical and Systems Thinking summed up above make up the weft and warp of planning.

Whether at the macro or the micro levels, planners can use Systems Thinking to effectively guide or determine daily sustainable development considerations such as:

- flood prevention schemes;
- establishing or expanding sustainable communities;
- siting of renewable energy generation projects such as wind farms.

All of these matters are effectively interactive systems that must work in harmony with natural systems and human activity. To undervalue the role of any element of the system could lead to failure of the whole or have a damaging knock-on effect. The following examples highlight just a few systems considerations related to the examples listed above.

The Flood Prevention (Scotland) Act 1961 gave local authorities discretionary powers to make and build Flood Prevention Schemes for the prevention of flooding of non-agricultural land. A local authority must carry out all work to land (apart from repairs) in accordance with a Flood Prevention Scheme. Flood Prevention Schemes must consider the greater watercourse system, historic patterns of flow and sink have been heavily affected by infrastructure and developments. So the flood prevention schemes that are put in place at great expense of effort, time and money, are only as effective as what happens upstream.

The Flood Risk Management (Scotland) Act 2009 is currently being introduced in stages, it sets out a more sustainable joined up approach to the organisations involved in flood risk management. To allow for better assessments to be made of flood risk every local authority is required to prepare maps which show relevant bodies of water and sustainable urban drainage systems in its area.

Establishing sustainable communities is not as simple as building green homes, installing Combined Heat & Power (CHP) schemes or introducing cycle routes. Sustainable communities need an identity or system which brings the parts together into a coherent whole and creates a sense of place. Communities do not tend to be manufactured; they tend to be grown from the energy, commitment, passion and dedication of those who will make these places their home. People make sustainable places.

The development of a PassivHaus is a good example of a building as a system. This approach to building is based on whole house design, in which the building works like a natural system, using passive ventilation, whole system insulation and integrated design. To remove or alter elements of the design even in minor ways can undermine the building's functionality. This differs significantly from other environmental assessment tools which favour more of an analytical, checklist approach to attributes scored in building designs and therefore fail to deliver systems benefits and much of the potential added value to building operations. Siting a wind turbine reflects the intricacy of integrating mechanical and natural systems. The turbine can only function effectively if it is established to respond to the natural flow of the wind. Natural systems have rhythms which do not go on and off on command, so the turbine must accommodate a variety of natural conditions to operate optimally.

Under section 72 of the Climate Change (Scotland) Act 2009, Local Development Plans must require all new buildings to be designed using low and zero carbon technologies in order to avoid producing the rising greenhouse gas emissions from their use. Local Development Plans should also set out the carbon reduction approach for existing buildings which are being altered or extended. In addition, the development plan policies for development involving low and zero carbon technologies should accord with the standards and guidance provided in building regulations.

The Scottish Government Energy Efficiency Action Plan sets out a practical vision to assist in moving towards a low carbon economy. The key actions relating to energy efficiency include to improve the energy efficiency of all our housing stock to meet the demands of the future.

A further system complication for wind turbines which can be of particular relevance in Scotland relates to the implications for positioning turbines on peatlands. The complication here centres on the possibility that the installation of the turbine may cause the peatland on which it stands to drain, dry and release its stored carbon. This could ultimately unleash more emissions into the atmosphere than would have been released through standard carbon based energy generation and consumption, so removing the benefits of using renewable energy sources.

Each of these examples only touch upon the systems operating which require investigation and understanding for sustainable development to work. The exercises set out in chapters 7 and 8 that will reflect concerns directly relevant to your role will depend heavily on applying Systems Thinking.

To improve your confidence in using Systems Thinking, use the web link to the Open University/ BBC Systems Thinking resource and work through the five stages in the Thinking section. There you will find three interactive tools on perspectives, boundaries and models applied to a planning question concerning woodland development. The site also contains good case studies

within the Resources section and a useful Glossary.

Relevant tools, their scope and their characteristics

Systems Thinking and use of Leverage Points sets the context for other sustainable development tools available and relevant to local authority planners. As understanding of the range and scale of the task for planners and other professionals in addressing these issues has and continues to increase, the implementation of relevant and customised/customisable tools is essential as every situation will have its own unique system characteristics which need to be considered. The selection of tools will depend on whether macro or micro tasks are being addressed.

Longstanding tools such as Environmental Impact Assessment (EIA) and Standard Assessment Procedures for Energy (SAP) remain in force. These tools form the underpinning for new and varied tools such as Strategic Environmental Assessment (SEA) and Energy Performance Certificates (EPCs), respectively, which respond to European directive requirements.

Other tools, such as sustainable design guidance, ecological footprinting and carbon assessment, respond to evolving needs which may be driven by government policy or NGO introduction and lobbying. As with any tool, the usefulness of these and other sustainability mechanisms is directly related to the:

- input of robust and relevant information and data;
- relevance of the tool to the task at hand;
- timing of inputs and outputs relevant to decision-making;
- selection of the most effective tool available;
- degree to which the tool can be customised to situation and circumstance;
- transparency of the outputs and accessibility of outputs to stakeholders and decision-makers;
- authority of the assessments and/or judgments the tool delivers;
- sensitivity to and reflection of relevant policy, programmes, plans and regulation.

In applying any of a range of tools, local authority planners need to feel confident both in terms of the process and the outputs. Tools should support assessments and decision-making but can never replace professional judgment and balanced decision-making. These qualifications cannot be overestimated — it is only when these conditions are met that those making planning decisions will be confident to make authoritative pronouncements which direct other professionals and the public.

Tools are only as useful as their circumstances and users allow. The use of some tools is very specific while others can be employed in a wide number of different circumstances and to different ends. The selection and application of the following tools should be taken after a systems assessment of a task has been conducted and the range of available Leverage Points identified.

What follows is a brief catalogue of tools with direct relevance to the planning system. This is not an exhaustive list, but it sets out some better and lesser known resources upon which planners can draw. This list of tools is also directly relevant to the remaining tasks and exercises set out in this workbook.

- Scientific Benchmarking (IPCC, UNEP, SEPA)
- Backcasting
- Forecasting
- Scenario building
- Strategic Environmental Assessment (SEA)
- Supplementary Guidance for Sustainable Development (Highland Council, City of Edinburgh Council)
- Ecological footprints (WF/SSN)
- Sustainable Development Checklists
- Environmental Impact Assessment (EIA)
- Health Check Lists (Greenspace Scotland Health Impact Assessment Tool)
- Key Performance Indicators
- Environmental design tools for buildings (BREEAN/EcoHomes, LEED)
- Carbon reduction design tools for buildings (CarbonLite, Passivhaus)
- Carbon counting and accounting
- Local and Regional Carbon Management Matrix
- Sustainable Energy Benchmark and Toolkit for Local Authorities
- UKCEED Carbon Emissions Toolkit

Exercise 5: Tools

This exercise will help you to determine where tools sit in regard to Systems Thinking.

Map the tools outlined above against the System Thinking values you have previously discussed. Which tools best suit which types of interventions?

Which tools would you use directly (both in strategic and tactical work)? Identify if you would be the primary or secondary user.

What benefits would each bring to being able to affect change with greater information and confidence?

What weaknesses/gaps can you identify in the available tools?

7. Building sustainable development into development plans

Any strategic planning requires an understanding of that likely future, accounting for the environmental but also the human dimensions of change.

Strategic planning to master planning

As the science of existing and future climate change more conclusively reflects a narrowing window of time to make massive change in our use of energy and resources, the relevance of planning decisions taken today stands out in sharper relief.

Planning for land use, infrastructure, energy source siting, community expansion and security not only sets levels of future impacts but demands we design and build with an understanding of how the world and our climate will be, not what it is today.

Reflecting back to Chapter 2, the best science available tells us that the climate in Scotland will be wetter, warmer, stormier and less predictable, with more flooding and erosion and widespread changes to the flora and fauna. Global changes of a more extreme level impacting in the developing world would seem likely to increase migration to countries like Scotland, impacting on the sufficiency of infrastructure in its capacity, adaptability and durability. Any strategic planning requires an understanding of that likely future, accounting for the environmental but also the human dimensions of change.

Tools referred to such as forecasting, backcasting and scenario building, in combination with Systems Thinking, form the backbone of assembling plans that drive sustainable development, dramatically mitigate our impacts and prepare Scotland through sound adaptation for a climate changed world.

The kinds of key questions tools help us address are:

- What do the climate change projections over the next 100 years mean locally?
- What impacts will this have on existing and future local buildings and infrastructure?
- What will be the pressures on water courses locally and upstream, and where will they come from?
- How can area planning most effectively address the adaptation needs of the future?
- What will be not be able to adapt and what other changes does/will that incur?
- How will the state of Scotland's environment affect its demographics nationally and locally?
- What is required in order for any area under planning consideration to have emissions of at least 80% less than today?
- How can we treat buildings and/or groupings of buildings as energy sources rather than energy sinks?
- What are opportunities for decentralised, low carbon energy generation?
- What local health and healthcare issues might a changed climate bring?
- Who is the local area waste plan expected to grow and evolve?

- Do we need new development in the first place or can we adapt what we need?
- What stakeholders bring the greatest contribution to these questions and how can that intelligence and commitment be harnessed?
- How does the local community participate in a planning process that will bring and will demand of society some of the greatest changes and challenges yet to be faced?
- How can planners help the community navigate this process, genuinely reflecting the scale and intensity of the challenges to be faced while engendering their confidence to participate and act?
- How can planners work more consistently, effectively and efficiently with other local authority officers?
- How can politicians communicate the many related needs and work in bi-partisan ways to speed up uptake of far greater sustainable development and change?

The whole nature of the planning system in Scotland is evolving in response to the Planning etc. (Scotland) Act 2006. The primary government bodies/agencies and commercial organisations which contribute directly to the Scottish planning system will need to take responsibility for driving and supporting sustainable development and climate change objectives and will contribute to how the questions above can and will be answered, and how Strategic Development Plans and Local Development Plans take up this agenda.

The Planning etc. (Scotland) Act 2006 introduced a requirement that functions relating to the preparation of development plans by planning authorities must be exercised with the objective of contributing to sustainable development. *Scottish Planning Policy* (SPP) paragraphs 34-44 set out national planning policy on sustainable development, explaining the actions that can be taken through the planning system to support sustainable development.

The SPP explains that the planning system has an important role in supporting the achievement of sustainable development through its influence on the location, layout and design of new development.

***Scottish Planning Policy*, paragraphs 37-39**

Decision making in the planning system should:

- contribute to the reduction of greenhouse gas emissions in line with the commitment to reduce emissions by 42% by 2020 and 80% by 2050, contribute to reducing energy consumption and to the development of renewable energy generation opportunities,
- support the achievement of Zero Waste objectives, including the provision of the required waste management installations,
- protect and enhance the cultural heritage,
- protect and enhance the natural environment, including biodiversity and the landscape,
- maintain, enhance and promote access to open space and recreation opportunities,
- take into account the implications of development for water, air and soil quality, and
- support healthier living by improving the quality of the built environment, by

increasing access to amenities, services and active travel opportunities, and by addressing environmental problems affecting communities.

Decisions on the location of new development should:

- promote regeneration and the re-use of previously developed land,
- reduce the need to travel and prioritise sustainable travel and transport opportunities,
- promote the development of mixed communities,
- take account of the capacity of existing infrastructure,
- promote rural development and regeneration, and
- prevent further development which would be at risk from flooding or coastal erosion.

Decisions on the layout and design of new development should:

- encourage the use of and enable access to active travel networks and public transport,
- promote the efficient use of land, buildings and infrastructure,
- encourage energy efficiency through the orientation and design of buildings, choice of materials and the use of low and zero carbon generating technologies,
- support sustainable water resource management,
- support sustainable waste management,
- consider the lifecycle of the development,
- encourage the use of sustainable and recycled materials in construction, and
- support habitat connectivity.

On the matter of climate change the SPP advises that development plans should promote a pattern of development which reduces the need to travel and encourages active travel and travel by public transport, taking into account the likely availability of public transport in rural areas. Development plans should also require the siting, design and layout of all new development to limit likely greenhouse gas emissions, particularly by limiting resource and energy requirements.

Development should therefore normally be avoided in areas with increased vulnerability to the effects of climate change, particularly areas at significant risk from flooding, landslip and coastal erosion and highly exposed sites at significant risk from the impacts of storms. When designating land for new residential, commercial and industrial development, planning authorities should consider the energy and heat requirements of these new developments. New development should be planned to make use of opportunities for decentralised and local renewable or low carbon sources of heat and power wherever possible.

The Climate Change (Scotland) Act 2009 introduces a new duty for all public bodies to exercise functions in a way that is best calculated to contribute towards the greenhouse gas reduction targets and the Climate Change Adapation Framework.

In light of this new statutory framework, planning authorities are increasingly seeking advice from agencies on climate change issues. The *Planning and Climate Change: Key Agency and Scottish Government Resources and Guidance* document (http://www.scotland.gov.uk/Resource/Doc/212607/0109546.pdf) provides useful resources and information from the Agencies that will assist planning authorities to integrate climate change issues into their planning decisions.

8. Applying sustainable development in development management

Day-to-day development management decisions, whether these are large wind farms, single houses in the countryside or regenerations of older assets to new purposes, should be informed by the same sustainable development understanding and Systems Thinking as more overtly strategic work.

A question of scale?

It is often difficult when considering the scale of change required by sustainable development and climate change to feel there is fundamental value in some of these tasks. How can one's house, office or shop matter in the greater scheme of things? How can one element of one of these buildings matter much?

The scale and severity of the risk, coupled with the ultimately poor performance quality of our building stock and the pressure on our aging infrastructure judged against the scale and scope of opportunity (charted in Chapter 4), shows that even seemingly small matters count.

Each and every one of these decisions is important:

- in and of itself;
- as part of a collective and linkable entity or system;
- in the leadership and responsibility it demonstrates to ourselves and those who learn from us.

Because built assets last decades, if not centuries, what we build and renovate today will have a direct impact on how, and if, we achieve our 80% reduction in emissions by 2050 as set out in Climate Change (Scotland) Act 2009. Every decision we make should work hard to get us as close to that number today as possible or risk being a waste of effort, materials, time, energy and carbon against a tickling clock for all of these criteria. This is not easy or straightforward, but it is essential and planners will be crucial contributors to achieving the necessary outcomes.

Systems

Buildings and infrastructure have the added benefit of embodying physical systems and closed loops. An office with great solar shading systems and clever Built Environment Management Systems (BEMS) but lots of artificial lighting and set on an open, unshaded site is highly likely to suffer from heat gain. A house with a super efficient boiler will ultimately end up heating the outdoors if it has poor insulation, high levels of single glazing or high air infiltration.

The Building (Scotland) Act 2003 sets out regulation of standards for moving further towards sustainable development such as meeting energy standards that are comparable with the best in the EU.

Minimum energy and sustainability standards for new build, alterations and extensions to buildings in Scotland are set by the Scottish Government through the Scottish Building Standards (http://www.scotland.gov.uk/Topics/Built-Environment/Building/Building-standards). New enhanced standards came into force in October 2010 and are due to be improved again in 2013 to help reduce energy demands.

A Low Carbon Building Standards Strategy for Scotland, also known as the Sullivan Report recommended challenging but realistic targets for future building standards in Scotland:

- The 2013 change in energy standards for new non-domestic buildings should deliver carbon dioxide savings of 75% more than 2007 standards.
- The 2013 change in energy standards for new domestic buildings should deliver carbon dioxide savings of 60% more than 2007 standards.
- Net zero carbon new buildings (i.e. space and water heating, lighting and ventilation) by 2016/2017, if practical.
- The ambition of total-life zero carbon new buildings by 2030.

At the 'greater world' scale, which is after all what sustainable development must embrace, are the issues of where greenhouse gas emissions, resource consumption, pollution, etc. take place. For instance, insulation materials that used large quantities of energy in their manufacture are contributing to carbon levels even though they help save energy in operation. If they further release greenhouse gases on eventual disposal they become climate change time bombs for future generations. All of these issues require awareness and consideration.

Using tools

Much attention has been given in recent years to environmental score cards or accreditation systems for buildings. These have their place and can be useful aid memoirs for designers, planners and clients. Many of these tools, however, support linear, analytical thinking, allowing users to build up a score by cherry picking items that are easier, cheaper, more marketable, and more politically favourable.

A small number, such as Passivhaus, take a systems approach to building design as set out previously. It is important for local authority planners to understand the relative benefits of these different tools and consider how each fits into achieving the scenarios they have tested and the strategic plans they have developed and adopted.

It is important to consider which tools can be/have been, customised to their local circumstances including, but not limited to:

- context (rural, edge of town, urban);
- microclimate (windy, exposed, dry, damp);
- setting (conservation area, greenfield, brownfield);
- community needs (social, economic, and cultural).

Before accepting the output of a tool as part of a planning application it is important to consider its specific relevance. Questions would include:

- Do tools account for local circumstances or are they generic?
- Can you easily see what makes up a score or rating and judge for yourself the value of its composition?
- Do you agree with the values it expresses and if not, why not?
- Are the values or priorities of the tool consistent with your local authority's objectives and the strategic plans within which the site to which the tool has been applied?
- If not, which is the one that ultimately needs to prevail or change?

This is not to suggest that you should be suspicious of tools or those who use them. Their use and the outputs they produce should form the basis of a discussion about a planning application, both with applicants and with stakeholders.

Establishing partnerships in the pursuit of these shared goals is at the heart of the delivery of Scotland's sustainable development future.

9. Conclusion and doing things differently

Sustainable development will always present challenges. These are likely to grow greater as climate change advances, the global population grows and unforeseen needs and risks become apparent.

Skilling for these challenges requires on-going effort and thought to break out of non-Systems Thinking approaches which often work against sustainable development and climate change problem solving. As with all skills, application becomes easier and more natural with practice. The more we train ourselves to use Systems Thinking, listen closely to actors as well as observers and use sustainable development tools, the more comfortable and effective we will become as professionals and individuals.

Westerton House, Westerton Road
East Mains industrial Estate
Broxburn
EH52 5AU
Tel: 01506 775558
Fax: 01506 775566
Email: info@improvementservice.org.uk
www.improvementservice.org.uk

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improvement service

The Improvement Service is devoted to improving the efficiency, quality and accountability of public services in Scotland through learning and sharing information and experiences.