

Planning Decision Support Tools for Sustainable Development and Renewable Energy.

Helen Chadwick

A thesis submitted in partial fulfilment of the requirements of
De Montfort University for the
degree of Doctor of Philosophy.

May 2003

Institute of Energy and Sustainable Development
De Montfort University Leicester

Abstract

This research investigates the potential to deliver sustainable development through integrating national policy at local level, via the land use planning system. It finds that the principle of sustainable development is supported throughout the land use planning system, but can be lost when the overarching principle is divided into different policy goals with their own objectives and targets. The adoption of strong policies on sustainable development can also be difficult since national policy does not always support more innovative approaches.

Planning tools can help with the integration of policy. Supplementary planning guidance (SPG) is particularly useful to support the enactment of policy and a model SPG has been developed as part of this research. Sustainability appraisal can guide the development of policy. A case study of the preparation of the East Midlands Regional Planning Guidance illustrates the benefits of appraisal in identifying gaps and conflicts in policy, and in supporting a more integrated approach across all regional strategies.

Tools however cannot deliver sustainable practice; the planner's role is also vital. Individual planners in local authorities are responsible for the strategic planning and delivery of sustainable solutions through development control. The planners' attitudes to sustainable development issues may influence their choices regarding delivery of sustainable solutions. The results from a questionnaire survey indicated a high level of consensus amongst planners on the issues of most importance for new development. As the issues considered to be of most importance are those that are likely to be given the highest level of support in the planning process, other issues may be sacrificed in negotiation or not considered at all. This implies that policy integration may be difficult to achieve in practice.

In parallel, the research considered the potential conflicts between one national policy arena, namely energy, and land use planning. A review of national energy policy objectives found that they did not always support sustainable development objectives and that gaps in policy were evident and conflicts possible. In particular, some policy areas had no monitoring or weak indicators to measure progress. Land use planning has few direct interactions with national energy policy but the location and layout of development has implications for the use of energy and the development of renewable energy has led to apparent conflict with the land use planning process. A review of the planning framework for energy indicates that reduction of energy use through layout and design has some support in planning policy, but that support is still relatively weak.

Renewable energy installations have experienced some difficulty in the planning process, which could be due, in part, to planners having a negative attitude to renewable energy. This research showed that planners have very positive attitudes to renewable energy but are unsure of the support of local people. Planners feel that local people are not familiar with renewable energy. Planners also feel that some technologies are likely to be more acceptable than others, with wind and waste considered to be most unacceptable to local communities, in planners' opinion. The planners' view of the acceptability of renewable energy to local community is likely to be an important influence in the planning process.

Acknowledgements

This research was carried out at the Institute of Energy and Sustainable Development, De Montfort University, Leicester.

I would like to thank the members of the East Midlands Sustainable Development Advisory Group for their input to the research on the appraisal of RPG in the East Midlands. I would particularly like to thank Peter Jaggar for his clarification of the complexities of the English planning system and support during the preparation of the model supplementary planning guidance.

I also wish to gratefully acknowledge the assistance of the Planning Officers Society, who provided mailing lists for the delivery of the survey to a wider range of planning officers than would have been possible to reach otherwise.

Contents

Chapter 1.	Introduction	1
Chapter 2.	Sustainable Development and Land Use Planning	4
	2.1. Sustainable Development – A New Policy Driver	4
	2.1.1. UK Policy on Sustainable Development	5
	2.2. Land Use Planning	8
	2.2.1. National and Regional Planning Guidance	11
	2.2.2. Development Plans	14
	2.2.3. Development Control	20
	2.3. Future Changes to the Planning System	27
Chapter 3.	Sustainable Use of Energy and Land Use Planning	31
	3.1. Drivers of UK Energy Policy	31
	3.2 Delivering Sustainable Development Through Energy Policy	35
	3.2.1. Reducing CO ₂ Emissions by 60%	38
	3.2.2. Maintaining Reliable Energy Supplies	39
	3.2.3 Promoting Competitive Markets	40
	3.2.4. Ensuring Homes are Adequately and Affordably Heated	41
	3.3. Integrating Energy Sustainably in Land Use Planning	41
	3.3.1. Site layout and Design	42
	3.3.2. Renewable Energy	45
	3.3.3. CHP and District Heating	51
Chapter 4.	The Role of Tools in Planning for Sustainable Development	53
	4.1. The Need for Tools	53
	4.2. Tools for Policy Development	54
	4.2.1. Strategic Environmental Assessment and Sustainability Appraisal	54
	4.2.2. Environmental Capacity	59
	4.3. Tools for Policy Enactment	61
	4.3.1. Supplementary Planning Guidance	61
	4.3.2. Environmental Impact Assessment	62
	4.3.3. Public Participation	64
	4.3.4. Checklists	65
	4.4 The Role of the Planner	66

Chapter 5.	The Use of Sustainability Appraisal in Strategic Spatial Planning: A Case Study of the East Midlands Regional Planning Guidance Appraisal Process	71
5.1.	The Evolving Regional Picture in England	71
5.1.1	Regional Planning Guidance	72
5.1.2	Regional Development Agencies	73
5.1.3	Regional Chambers	75
5.1.4.	Regional Round Tables	77
5.1.5	Regional Sustainable Development Frameworks	78
5.2.	The Use of Sustainability Appraisal in East Midlands RPG	79
5.2.1	The Background to Recent Developments in the East Midlands	79
5.2.2.	Developing the Appraisal Methodology	81
5.2.3	Applying the Methodology	85
5.2.4	The Value of the Appraisal Process in the East Midlands	90
Chapter 6.	Attitudes and Awareness of Land Use Planners to Sustainable Development and Sustainable Energy	94
6.1.	The Need for Research	94
6.2.	Methodology	97
6.2.1.	Research Design	97
6.2.2.	Pilot Study	98
6.2.3.	Final Survey	98
6.3.	Results	104
6.3.1	Sustainable Development	104
6.3.2	Local Energy Policies and Energy Efficiency Measures	109
6.3.3.	Renewable Energy	111
6.4	Discussion	121
6.4.1	Sustainable Development	121
6.4.2	Local Energy Policy	124
6.4.3	Renewable Energy	125
Chapter 7	Conclusions and Recommendations for Further Work	128
References		134
Appendix A	Review of Energy Policy	
Appendix B	Model Supplementary Planning Guidance produced for a workshop on planning and renewable energy	
Appendix C	Planning Officers Survey Questionnaire	
Appendix D	Published Work Arising from this Research	

List of Figures

Chapter 2.	Sustainable Development and Land Use Planning	
	Figure 2.1. The Process of Adopting a Plan	18
	Figure 2.2. The Development Control Process	23
Chapter 5.	The Use of Sustainability Appraisal in Strategic Spatial Planning: A Case Study of the East Midlands Regional Planning Guidance Appraisal Process	
	Figure 5.1. Objectives Led Approach	84
Chapter 6.	Attitudes and Awareness of Land Use Planners to Sustainable Development and Sustainable Energy	
	Figure 6.1. Frequency of Selection of Items Relating to Sustainable Development	106
	Figure 6.2. Frequency of Selection of Items Relating to Sustainable Development by sub-group	108
	Figure 6.3. Planners Attitudes to renewable energy	113
	Figure 6.4. Planners Perception of the Acceptability of Renewable Technologies to the Local Community	116

List of Tables

Chapter 2.	Sustainable Development and Land Use Planning	
	Table 2.1 Current Planning Policy Guidance	12
Chapter 3.	Sustainable Use of Energy and Land Use Planning	
	Table 3.1 Kyoto Basket of Greenhouse Gases	33
	Table 3.2. Sustainable Development Indicators relating to Energy	36
	Table 3.3. Planning Considerations for Renewable Technologies	46
	Table 3.4. Numbers of renewable energy Installations receiving planning permission	49
Chapter 6.	Attitudes and Awareness of Land Use Planners to Sustainable Development and Sustainable Energy	
	Table 6.1. Frequency of Selection of Items Relating to Sustainable Development	105
	Table 6.2. Summary of Responses on Local Authority Energy Policy	110
	Table 6.3. Summary of Responses on Attitudes to Renewable Energy	112
	Table 6.4. Summary of Means for the Acceptability of Different Renewable Energy Technologies	117
	Table 6.5. Summary of Responses on the Acceptability of Different Renewable Technologies	120

Chapter 1 Introduction

Sustainable development has been adopted as a National Government objective and has been enshrined in documents covering all aspects of public policy, nationally, regionally and locally. However, whilst sustainable development is a wide arching ideal with almost universal consensus (Myerson and Rydin, 1996), differences occur in the interpretation of the concept. Sustainable development is a process that requires the balancing of social need with economic growth and environmental protection both now and in the future. Thus, there is no easy framework to ensure delivery of sustainable development; it must be integrated into all policy areas.

UK policy has traditionally been developed in specific sectoral policy areas, such as health, education and transport and whilst the benefits of “joined up thinking” are lauded by the Government in practice, policy making is contained within these sectoral policy networks often supported by professional networks (Rhodes, 1992, WCED, 1987). These sectoral policy networks, or “silos”, do not always consider cross policy interaction. However, the effect of a particular policy is rarely isolated to the specific policy arena. Delivering sustainable development requires that cross policy effects are both considered and interpreted; integration across policy areas is essential.

Energy is one sectoral policy area that has wide ranging implications for sustainable development across many policy arenas. The effects of energy policy span the themes of sustainable development (social, environmental and economic, as well as participation and equity). For example, energy use has been identified as a major contributor to the growth of greenhouse gases in the atmosphere, contributing to atmospheric warming and leading to climate change. Energy policy in the UK has generally been addressed in a rather piecemeal

way (RCEP, 2000), with energy use and energy supply being dealt with by different departments. Policy integration is perhaps more difficult across this dispersed policy arena.

Land-use planning policy and decision-making has traditionally considered complex interactions between social, economic and environmental policy and action. Most other policy arenas are enacted within the spatial dimension. Spatial development has wide reaching and enduring implications for where we live, how we travel and our use of resources. Policy integration may therefore perhaps be more easily envisaged within this arena (Vigar and Healey 1999).

The aim of this research is to investigate how far sustainable development principles can be delivered in an integrated way through the land use planning process. The objectives of the research are specifically:

- To review national policy on land use planning, sustainable development and energy
- To assess the integration of these policies at local level through the local land use planning framework
- To evaluate the role of planning tools in facilitating this integration
- To analyse the attitudes and awareness of planners to sustainable development and sustainable energy policy within local planning.

The national policy on sustainable development and the land use planning system are reviewed in Chapter 2 of this work. The opportunities to deliver sustainable development through the local land use planning framework are assessed. The changes in planning expected, following enactment of legislation currently passing through parliament, are also discussed briefly.

National energy policy and the ability of the energy policy objectives to deliver sustainable development objectives are discussed in chapter 3. Appendix 1 offers a more detailed review of energy policy. Energy has not traditionally been an area of direct concern for land-use planners, but the form and layout of settlements have important implications for energy use and with the development of smaller scale energy installations, especially renewable energy there are more pressures on the land use planning policy process to consider energy generation and use. Thus the integration of a diverse policy area within land use planning will require new policy discourses. The role of land use planning for delivering more sustainable approach to energy use and generation is also discussed in chapter 3.

Planners have a variety of “tools” available to them to help in the delivery of land use planning policy. Some of these tools are suitable to help integrate sustainable development in planning policy and practice. Tools alone cannot deliver sustainable development; the role of the planner is crucial in the process of considering sustainable solutions. The role of the planner and a variety of tools are reviewed in chapter 4 and a model Supplementary Planning Guidance, developed for a workshop on renewable energy for planners and later developed for Leicester City Council, is included as Appendix 2. A case study of the use of sustainability appraisal and the implications for policy formation and the integration of regional strategy in the East Midlands is discussed in Chapter 5.

As identified earlier, the role of the planner is central to the delivery of sustainable development. In order to assess planners’ attitudes and awareness of sustainable development and sustainable energy, a survey of the planners in England and Wales was undertaken as part of this research. The analysis and results are presented in Chapter 6, with the survey attached as appendix 3.

This research illustrates that there are real opportunities for an integrated approach to policy at local level through land use planning, but the process is influenced by the attitudes of planners and the emphasis of national policy discourses. Whilst tools can help to identify

areas where policy integration can be carried forward, the role of the planner is still crucial.

This research has contributed new knowledge through:

- Design of an original questionnaire sent to over 900 planners and the subsequent analysis of responses
- The development of Supplementary Planning Guidance adopted by Leicester City Council to support their planning policy.
- The evaluation of sustainable development, energy and land use planning policy integration and its implication for local land use planning.

Chapter 2 Sustainable Development and Land Use Planning

2.1. Sustainable Development – A New Policy Driver

The introduction of sustainable development as a concept can be traced back to the Bruntland Report (WCED 1987). The definition of sustainable development was first encapsulated in this report

“to ensure that it [development] meets the needs of the present without compromising the ability of future generations to meet their own needs” (WCED, 1987, p8).

The concept was then confirmed as a major new driver in international policy at the Earth Summit in Rio de Janeiro (UNCED 1992).

The evolution of sustainable development as a principle of policy can be traced through the growing knowledge and awareness of specific environmental issues (for example Hardin, 1968), together with the myriad of justice and equality issues raised by the wide differences in quality of life across the globe and the implications for the world in supporting its growing population (Meadows et al.1972). These discussions are generally framed around the concept of sustainability, which is concerned with specifying limits and capacities of the environment to support human activity without environmental degradation.

Whilst the principle of sustainability enjoys almost universal consensus, the meaning of “sustainable development” is interpreted differently by different groups. The subtle differences between the concept of sustainability and the adopted policy goal of sustainable development,

and the many and various definitions thereof, have been the focus of much discussion (Myerson and Rydin 1996).

The arguments about precise definitions of sustainable development are less relevant if the idea of sustainable development is a political notion (Buckingham-Hatfield and Evans, 1996). An acceptance of the ideal of sustainable development recognises that however we define it we must adopt changes to our current practices across all human systems. Unlike most policy goals, sustainable development is not a goal to achieve now by a set date but in fact, a process that guides all policy choices now and in the future. The speed of this process will vary depending upon the starting point and aspirations of the specific group. Some groups, such as environmental bodies, have adopted the ideal of sustainable development much earlier than other groups, such as the business sector. In some cases the language of sustainable development has been adopted in a token way masking a continuation of current policy discourses. Once sustainable development is adopted as a policy goal, however reluctantly, there are implications for the application of policy and the beginnings of new policy discourses (Healey 1999). This can be seen in the development of UK policy.

2.1.1. UK Policy on Sustainable Development

The concept of sustainable development was first introduced in UK policy in the 1990s. International debate was leading to pressure for action on certain environmental problems that had an international dimension, including ozone depletion and acid rain. European legislation was a particular driver of new UK legislation. In the UK, the publicly perceived value of local environmental assets, particularly the open countryside, brought the environment higher up the political agenda. The lobbying of a variety of special interest groups had raised the profile of environmental concerns and created a political space for new policy.

In the wake of the Bruntland Report, the first policy document was “*This Common Inheritance*” (DoE 1990), the first comprehensive White Paper on the environment in the UK. The foundation of policy in this document was “*our responsibility to future generations to preserve and enhance the environment of our country and our planet*” (DoE 1990 paragraph 1.14).

This paper fell short of a holistic approach to sustainable development, but rather tagged environmental considerations onto mainstream issues. In some respects it was merely a re-badging of current policy and a response to international pressures. However the importance of the “*precautionary principle*” (i.e. not waiting for full proof of environmental damage but acting earlier if serious environmental damage could occur) was accepted, with important implications for future policy action.

The integration of environmental considerations into economic policy was identified as necessary to achieve sustainable development and the market forces favoured by the then Government were identified as the best instrument to achieve this. Social and economic issues were not included within the document in an integrated fashion, although they are highlighted in respect of certain actions.

In the wake of the Earth Summit at Rio a more wide reaching strategy was devised, “*Sustainable Development – The UK Strategy*” (DoE 1994). This strategy was again rooted in environmental concerns, although there was more integration of the economic and environmental issues surrounding particular industrial sectors. The impacts of economic development on the natural environment and the potential costs to business of unsustainable processes were considered. Issues relating to resources, such as minerals, were identified as potential future pressures on achieving sustainability. Energy, transport and waste were highlighted for their economic and environmental impacts. Although a need to inform and include people in the decision making process is identified, there is no integrated approach to social issues, such as housing, affordable warmth, crime and health.

The most recent Government White Paper “*A better quality of life – a strategy for sustainable development for the United Kingdom*” (DETR 1999a) included aims for social progress together with environmental and economic concerns for the first time. There are four overarching objectives:

- Social progress which recognises the need of everyone
- Effective protection of the environment
- Prudent use of natural resources
- Maintenance of high and stable levels of economic growth and employment

This more integrated approach recognised the interconnectivity of policies across these objectives. The need for these objectives to be achieved, both for present and future generations, was acknowledged. There was recognition that compartmentalised government policies and actions had often failed to solve social and environmental problems, because the importance of issues across these themes had not been recognised. For example the failures in urban regeneration schemes, where social issues had not been considered, particularly issues of participation of the affected community. The Government identified that there was a need for continued economic growth, but that society is no longer able to support the costs associated with poorly considered development. Social and environmental costs need to be included as part of the economic equation. The need to measure and monitor the effect and progress of policy action was emphasised in this strategy, which led to the compilation of a comprehensive set of indicators to monitor progress (DETR, 1999b). Targets were used in some instances as benchmarks of progress.

Sustainable development now appears in all policy statements and is confirmed as a part of the policy framework in the UK. However, the delivery of sustainable development is less certain. Each policy area has its own policy objectives and these may conflict with sustainable

development objectives (as we will see in chapter 3). As sustainable development is devolved into other policy areas such as energy, transport and housing, the objectives of that particular public policy area define the key outcomes on which that department is monitored (Barling et al, 2001). The need to meet targets may become the main driver and the wider sustainable development objectives lost. Sustainable development also depends upon the cross cutting policy objectives being recognised and delivered in partnership with other departments and stakeholders, but in practice the need to meet departmental targets may discourage the development of cross department working, maintaining policy “silos” (Rhodes, 1992). Thus, sustainable development is difficult to integrate into the public policy process.

“Although the idea is simple, the task is substantial” (DETR 1999a chapter 1 paragraph 1.2)

2.2. Land Use Planning

The way in which land is used and developed has important implications for the way in which we live (Barton et al 1995). The form of spatial development both at an individual and community level, influences choices about matters such as transport, energy usage, waste and resource use (Naess, 2000). In addition, spatial patterns change slowly over time. So decisions made now about spatial development will have implications for a number of generations.

Following the Earth Summit in Rio de Janeiro, the goal of sustainable development was introduced into land use planning policy. Land use planning, whilst primarily concerned with development of land, interacts with many different policy areas across social, environmental and economic themes. It is also concerned with development over a period of time and the impact on the local community. Land use planning has been suggested as the appropriate realm to integrate policy goals to achieve sustainable development at the local level (Vigar and Healey, 1999). The current Government states:

“An efficient planning system promotes a sustainable pattern of land use. Planning promotes local economies, regenerating rural and urban areas and protecting our valuable heritage.” (Office of Deputy Prime Minister, 2002a)

The policies that guide development of land form part of the institutional framework in which decisions about and choices for development are made. In England and Wales land use planning is a quasi-judicial process governed by legislation, under the Town and Country Planning Acts. The purpose of these Acts has been to balance the benefits of development with the need for conservation, and the aspirations of the individual with those of the community. However, planning itself exists within the current political and economic framework and responds to current driving forces.

“Town planning is to do with property and land, and therefore with money and power”
(Greed 1996 p5).

A very commonly quoted definition of town planning is

“the art and the science of ordering the land uses and siting of buildings and communication routes so as to secure the maximum level of economy, convenience and beauty” (Keeble, 1969).

However in the absence of market forces, planning may have no theoretical basis to deliver optimum development (Reade 1987).

Evans (Evans, 1997) suggests that land use planning should be seen a process to deliver current Government policy, in the same way as other public policy process. So policy ends should not be confused with policy process, rather the aims of Government policy should be defined strategically. The framing and implementation of land use policy are of vital importance to delivering policy outcomes, including the policy goal of sustainable development.

The modern town planning system can be traced back to the post war era (Greed 1996, Reade 1987). The *Town and Country Planning Act, 1947* was the first comprehensive legislative document of the modern system. This Act put in place requirements for development to be guided by a plan for the area and that all development should receive planning permission. These tenets remain the central planks of the planning system.

The primary legislation currently governing the planning process is contained in three Acts of Parliament (PPG1 Annex C (DOE, 1997)):

- The Town and Country Planning Act 1990;
- The Planning (Listed Buildings and Conservation Areas) Act 1990; and
- The Planning (Hazardous Substances) Act 1990.

Each of these Acts has been amended by the Planning and Compensation Act 1991.

This legislation confirms the importance of a development plan for guiding local planning decisions. Section 54A of the Act states that:

“where in making any determination under the Planning Acts, regard is to be had to the Development Plan, the determination shall be made in accordance with the Development Plan, unless material considerations indicate otherwise.”

The main instruments of subordinate legislation are:

- The Town and Country Planning (General Permitted Development) Order 1995
- The Town and Country Planning (General Development Procedure) Order 1995
- The Town and Country Planning (Use Classes) Order 1987;
- The Town and Country Planning (Development Plan) Regulations 1991.

The current system for land use planning is a multi-tiered arrangement, with

- National Planning Guidance
 - Regional Planning Guidance
 - Development Plans, consisting of
 - County Level Structure Plan
 - District Level Local Plan
- } And/Or Unitary Plan

Then at local level guided by the above plans and policy

- Development Control

The preparation of development plans and delivery of development control are carried out by local authorities that have been designated as Local Planning Authorities (LPA).

2.2.1. National and Regional Planning Guidance

Planning law and policy, in England and Wales,¹ presently come under the remit of Office of the Deputy Prime Minister (ODPM). The current policy framework is constructed around central policy guidance and a legal framework of precedence. This puts Britain in a unique position in Europe, with the majority of European neighbours lacking this central co-ordinating role (Allmendinger and Tewdwr-Jones, 2000).

National policy guidance, up to the late 1980's, had been provided through a series of departmental circulars. A need for a more strategic approach was recognised by the Government leading to the introduction of Planning Policy Guidance (PPG) notes in 1988 (Tewdwr-Jones, 1997). PPG is currently the main stay of Government guidance in land use issues and in particular for guiding policy in local development plans (Quinn 1996). Guidance may still be

¹ The land use planning system in Scotland is slightly different to England and Wales and is not covered in this study

provided through Planning Circulars, to cover very specific areas, or changes in national guidance, prior to review of PPG. PPG now exists for a range of policy concerns including housing, transport and renewable energy. Table 2.1 provides a summary of current PPGs.

Planning Policy Guidance Note	Description	Date
PPG1	General Policy and Principles	1997
PPG2	Green Belt	1995
PPG3	Housing	2000
PPG4	Industrial and commercial development and small firms	1992
PPG5	Simplified Planning Zones	1992
PPG6	Town Centre and Retail Development	1996
PPG7	The Countryside - Environmental Quality and Economic and Social Development	1997
PPG8	Telecommunications	2001
PPG9	Nature Conservation	1994
PPG10	Planning and Waste Management	1997
PPG11	Regional Planning	2000
PPG12	Development plans	1999
PPG13	Transport	1994
PPG14	Development on Unstable Land	1990
PPG15	Planning and the Historic Environment	1994
PPG16	Archaeology and Planning	1990
PPG17	Planning for Open Space Sport and Recreation	2002
PPG18	Enforcing Planning Control	1991
PPG19	Outdoor Advertisement Control	1992
PPG20	Coastal Planning	1992
PPG21	Tourism	1992
PPG22	Renewable Energy	1993
PPG23	Planning and Pollution Control	1994
PPG24	Planning and Noise	1994
PPG25	Flooding	2001

Table 2.1. Current Planning Policy Guidance.

The differences that exist regionally across England are recognised in Regional Planning Guidance (RPG), which provides long term strategic spatial planning across a specific region. This guidance is expected to guide the development within that region over a 20-25 year span. RPG is however reviewed regularly. The status and role of RPG has evolving rapidly, mirroring the very significant changes in regional policy, since the election of the Labour Government in 1997 (Allmendinger and Tewdwr-Jones, 2000). The regional dimension in the UK is likely to become more important in the future, with evolving regional models within the UK and in response to the emerging EU interest in spatial planning through the European Spatial Development Perspective (ESDP) (Bishop et al, 2000). Other Government guidance includes Minerals Policy Guidance (MPG) and Marine Minerals Guidance (MMG).

Development plans are required to conform to national guidance. Thus the general policy thrust and priorities are defined nationally. Thus PPG may potentially support the importance of sustainable development in all development decisions. Throughout the 1990's there has been increasing emphasis placed on sustainable development within PPG and the importance of sustainable development has been more readily accepted within the planning process. However guidance in PPG is rarely radical, but rather supports consensus between planners and developers. The weight given to PPG in planning decisions and through the appeals process generally leads to local policy being overruled if it is not in conformity (Tewdwr-Jones, 1997). Thus local planning authorities (LPA) may not be able to take local policy beyond PPG in delivering local sustainability.

The broad framework of guidance prescribes against detailed and specific policy. This need not be a negative point since sustainable development may be delivered through more than one development choice. However it may also leave the guidance open to interpretation, causing uncertainty in the resolution of planning applications. Different interest groups are sometimes able to use different parts of the same PPG to support their arguments for or against a development. As PPGs are under constant development and review there is potential for

inconsistency across different PPGs. If the case for sustainable development is to be supported by PPG then any guidance must be clear and consistent. The weight given to sustainable development and the level of integration of policy approach will be vital in improving the importance of sustainable development in future policy making. PPG effectively leads the process of plan policy across the country. PPG can also inform developers on the approach to sustainable development. As developers become more aware of the policy framework, they are more likely to try to conform, in order to ease the passage of their planning application. Recent studies have suggested that planners have generally found the PPG to be useful and appropriate, giving a clearer framework for local planning decisions (Tewdwr-Jones 1997).

2.2.2. Development Plans

There are three types of development plan currently operating in England, the structure plan, the local plan and the unitary plan.

- Structure plans are produced by county level authorities and form an overarching strategic plan. Should guide development for a 15 year period.
- Local plans identify individual areas of development across a district or borough and provide guidance for a 10 year period.
- Unitary authorities may either collaborate on the structure plan for their county and produce their own local plan or else produce a single unitary plan with two parts, Part I effectively corresponds to the structure plan and Part II to the local plan.

Policies in the development plan may be supported by Supplementary Planning Guidance (SPG). The LPA uses SPG to provide more detailed information and guidance on specific issues for developers and the public. SPG must be consistent with the plan and must cross-reference any policies in the Plan. SPG can help to clarify plan policy, allowing the development plan to

remain concise. The exact approach to specific types of development, or overarching principles on development can be identified, which allows developers to have a clearer idea of the way their development can meet the needs of plan policy. SPG should generally follow the same process for adoption as the development plan if it is to have weight in the process of deciding a planning application.

PPG1 - General Policy and Principles, paragraph 39 (DOE,1997) sets out the role of development plans:

“The planning system regulates the development and use of land in the public interest. The system as a whole and the preparation of development plans in particular, is the most effective way of reconciling the demand for development and the protection of the environment. Thus it has a key role to play in contributing to the Government’s strategy for sustainable development by helping to provide for necessary development in locations which do not compromise the ability of future generations to meet their needs.”

PPG 12 (DETR,1999c) provides guidance on drawing up development plans. The status of national guidance, the role of the development plan and the process of preparing and adopting plans is clarified. PPG12 gives guidance on the areas that should be included in development plan policy, including:

- Housing; figures for additional housing requirement, targets for development on previously developed land
- Green belts
- Conservation and improvement of natural and built environment
- Economy of area
- Transport

- Minerals workings
- Waste treatment and disposal
- Tourism, leisure, sport and recreation
- Energy generation including renewable energy

All of these policy areas can have benefits and impacts across environmental social and economic well being. Guidance is clear that policies should only relate to land use planning issues.

All development plans are expected to be in conformity with national and regional guidance and other development plans for their area. If policies across the plans are in conflict the provision of the local plan will take precedence unless the structure plan authority have issued an official statement to the effect that the local plan is not in general conformity (and those policies have not subsequently been changed). Plans should be reviewed periodically to check that they remain in conformance with national guidance, with a major review every 5 years.

In practice conformity is difficult to achieve and maintain. National guidance has changed very rapidly through out the 1990's, with many new PPGs and major revisions of existing PPG.

Regional guidance has also been introduced for each of the regions throughout the 90's.

Structure plan and local plan preparation have not necessarily been in step. Review and amendments mean that plan preparation is an ongoing process in many local authorities.

Local authority planning officers are responsible for drawing up the development plan. The policies in the plan would be based on any previous plan, together with information from any local studies, such as a State of the Environment report. Any new National Government guidance, including draft guidance, would be considered at this stage. Officers may well discuss policy items with statutory consultees including the Environment Agency, English Nature and the Countryside Agency during the pre-draft stage.

In parallel the local planning authorities are expected to carry out a strategic environmental appraisal (SEA is commonly referred to as EA in this country) of their development plans. PPG 12 (DETR, 1999c) suggests that the same methodology could be widened to include social and economic sustainable development concerns.

Once the development plan is completed as a draft document, it must be approved by elected members before it is available for wider consultation, both with statutory bodies and the public. The draft plan would be placed on deposit for public consultation at libraries, in council offices and at other appropriate places over a period of a few weeks. Following the consultation period the Planning Authority would study any objections to the plan.

The objections are addressed either by incorporating into the plan or else through negotiation with the objector to find an alternative solution. Outstanding serious objections would be addressed at inquiry, held by an independent Inspector. The inspector will study the plan, the objections and any other relevant material and give a ruling. The Plan is then forwarded to the Secretary of State and adopted. Exceptionally the Secretary of state can call in all or part of a plan, if it is seriously out of conformance with current guidance. This would result in a further inquiry. The stages in the process are illustrated in Figure 2.1.

Process of Adopting A Plan

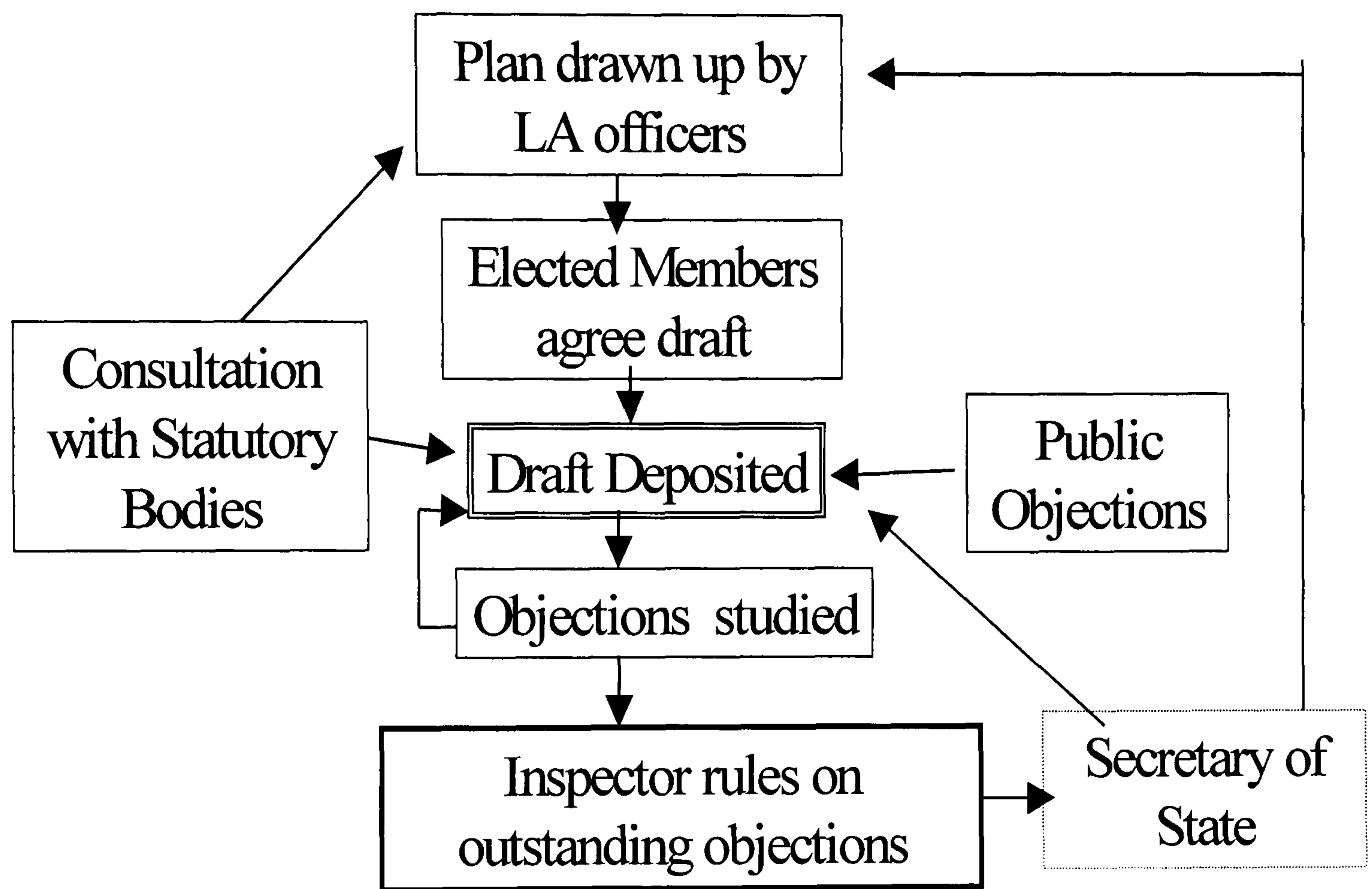


Figure 2.1. Process of Adopting a Plan

The English planning system is largely discretionary so initially it was not clear how far the pre-eminence of the plan would be accepted in development control decisions (Winter 1994).

However as time has elapsed it is clear that where the plan is up to date and contains relevant and consistent policies, the development plan should be the key determinant, unless there are other material considerations (Tewdwr-Jones 1997). Conversely where a planning application is not in accordance with the plan it should not be allowed unless material considerations justify granting the application. Thus the precise wording of policy is critical if sustainable development is to be carried forward to individual development control decisions.

If sustainable development is to be supported in local development decisions then the role of the development plan is pivotal. Development plans form the framework for all land use decisions within an area. Whilst an acknowledged aim of planning is to conserve the local environment (natural, historic and cultural) a prime aim is to facilitate development. These two drivers may not be easily achieved together within the current institutional framework. In addition, all national guidance makes clear that land use planning may only consider land use issues, or the land use aspects of other issues. Development plan policy should not venture into areas, which are guided by specific statutory instruments. For example it is difficult for local authorities to demand higher energy efficiency standards in buildings than expected through building control, even though these standards are really a minimum to be achieved. This narrow focus on land use can make it more difficult to achieve sustainable development, which by its nature operates across themes and requires an integrated approach if it is to be achieved. This has implications for approaching sustainable development holistically.

Studies have indicated that sustainable development issues are only slowly working their way into development plans, with little change in plan policy preparation evident (Hales 2000).

Where it has been included in plans, policies tend to support a weak form of sustainable development (Counsell, 1999) and are often more concerned with local environment issues, such as landscape (Jay, 2001). The main challenges to further integration are seen as lack of

time and resources, but there are indications that many planners feel that sustainable development is merely the latest bandwagon, soon to be replaced by something else. The varying definitions of sustainable development also raise problems. The weight given to environmental conservation over economic development defines the policy framework, but in the absence of any “scientific measure” of worth, these judgements are largely socially defined (Owen, 1994). Attempts to identify and protect specific environmental capital, via capacity studies or the use of precautionary principle, have run into difficulties in the plan development process (Counsell, 1999, Counsell, 2002). For sustainable development to be fully included then the meaning and consequences of sustainable development need to be accepted across policy areas and understood by those involved in drawing up policy (Cowell and Owens, 1997).

The adoption of the Development Plan is essentially a political process, since the elected members are responsible for accepting the draft and putting it out to consultation. The process of consultation can lead to the watering down of policies that seek to take forward the sustainable development agenda, once the views of the development industry are taken into account. There is a statutory right to public consultation; planning is one of the few policy areas where such a right to public consultation has been part of the process (Evans 1997). Most ordinary people have little experience or knowledge of either the development plan or the principle of sustainable development. Issues of importance to local people may not include all aspects of sustainable development, particularly where hard choices are required.

2.2.3. Development Control

Each individual development requires planning permission. The process of development control considers any new development (including a change of use) in the light of the development plans for the area and National Planning Policy Guidance (PPG), including RPG. Local land use issues are also important, for example traffic movements, visual amenity, noise, appearance, and impact on other local users.

Decision Making

Although the local plan forms the framework for development, it is not prescriptive. Whilst a development plan is a statutory requirement for an area, the policies within the plan do not individually have statutory force. There is a wide degree of flexibility and discretion in the decision making process. The importance of local land use issues is recognised in the Town and Country Planning legislation, which provides for the consideration of other “material considerations” when deciding a planning application. Previous court cases have suggested that *“In principle....any consideration which relates to the use and development of land is capable of being a planning consideration. Whether a particular consideration falling within that broad class is material in any given case will depend upon the circumstances”* (Stringer v Ministry of Housing and Local Government 1971) (Winter, 1994).

Individual planning permission involves a certain level of discretion, interpretation and negotiation (Claydon, 1998) on the part of the officer. Legal decision is the final recourse if the local negotiation does not lead to agreement by both parties. Development control decision making seeks to balance the needs and aspirations of the individual against the needs of the community and the protection of the environment against the need for development. Each individual case has different implications for individual and community, for development and environment, thus each must be assessed individually within the plan framework and national guidance.

This consideration of individual circumstance can make it more difficult to forecast the exact outcome of any planning application. Planning applications are processed by LPA development control officers, who advise the council’s elected members of an appropriate decision based on plan policy, current Government guidance and any precedence from other appeals cases. Local people also have an opportunity to comment on the process and raise any planning issues that may be material considerations in the case. Elected members are responsible for the final

decision. The local and political situation may influence decision-making process at this stage; however there must be sound planning reasons for the decision or it will be overturned at appeal.

At the end of the development control decision making process the planning committee of elected members have three options; award planning permission, award planning permission with conditions or refuse permission. The developer may appeal against the conditions and against the refusal of permission. The process then is decided at an appeal presided over by a Planning Inspector. The appeals process can be costly, and can add significant time to the process. The Inspector will look at all the evidence and make a decision based on planning concerns. The Inspector, as an independent representative of the Government in a role similar to a judge, will take into account the development plan and all other material considerations and make a decision, which may include conditions on the planning permission. The following diagram (Figure 2.2) summarises the process.

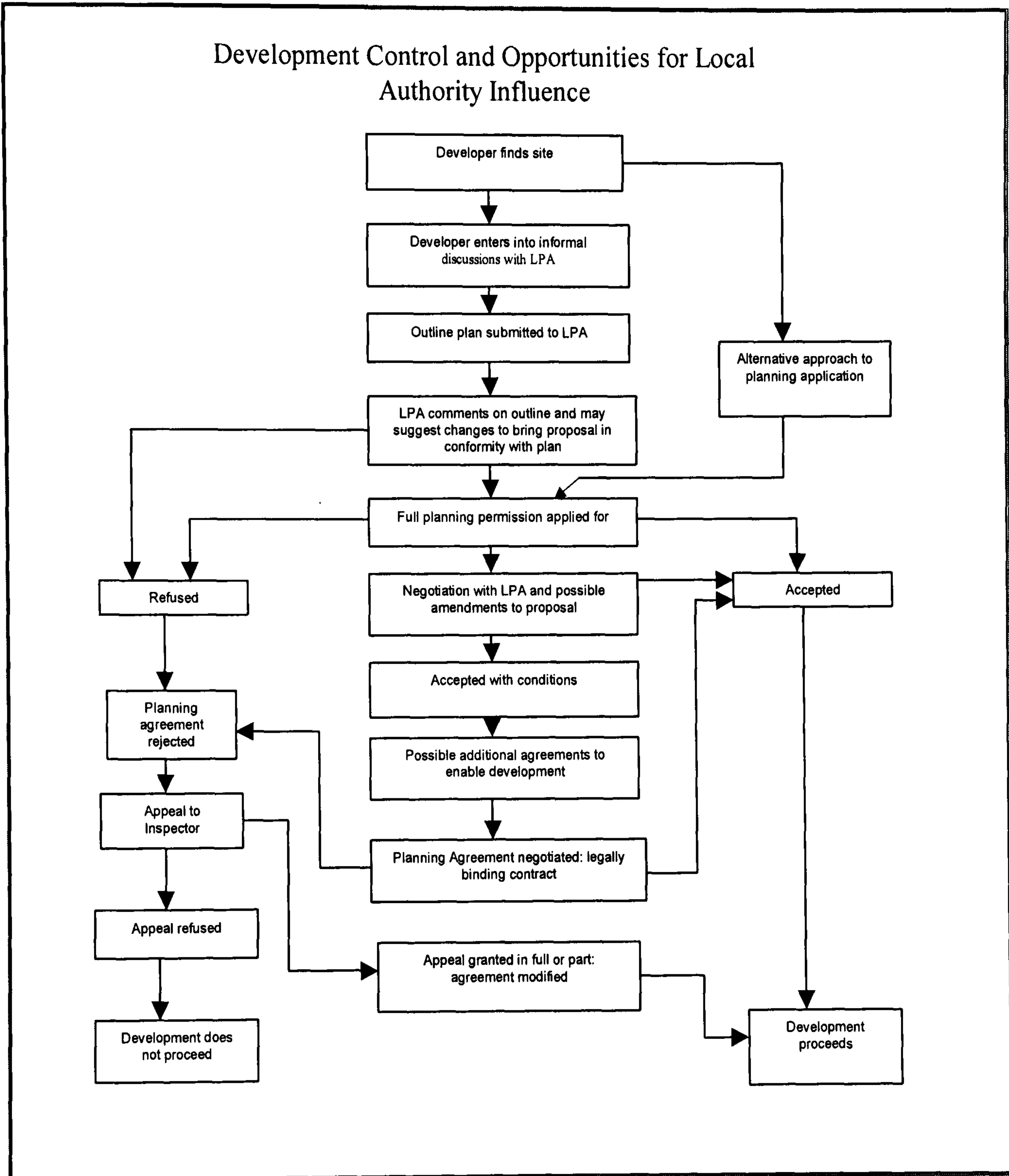


Figure 2.2. Development Control Process

Development Control potentially presents a powerful opportunity to include sustainable development at the heart of every development. Planning permission is required by all development, including a change of use. There is the opportunity to raise issues of importance in bringing forward sustainable development to all developers, from individual householders to large multinational concerns. However onerous conditions will not be supported at appeal and development control can only operate within the policies of the development plan, where these are weak or absent, development control is toothless. Even in a well thought out policy framework the inclusion of other “material considerations”, can lead to development that is not plan led.

The different interests in a development come together during the discussion of a planning application. The interaction of these interests does not always allow sustainability to be represented or even considered. The role of landowners, developers, community groups and political concerns are all central to any large development. Each of the players has their own interests firmly in site. The developers are keen to advance their proposal as quickly and painlessly as possible, landowners wish to see their land achieve the best price possible, community groups are often opposed to any development. The planning authority attempts to balance the needs of all these groups in the best interest of the whole area, but as the planning application is decided by the elected members, political concerns may also come to the fore.

The planning decision is based on the analysis of various data, including, plan policy, material considerations, cumulative impact, social and environmental impact and local opinion. Planning officers need to weigh all of this material. However Willis (1995) suggests that only the issues considered most important will really be considered. The weight given to different aspects of development may affect the inclusion of sustainable development principles. The attitudes of planners, politicians and community are all likely to have a bearing on the decision making process.

There are several other aspects of land use development, which militate against the inclusion of sustainability at development control. Projects are often well advanced by the time a planning application is submitted. Although changes can be requested or required, at a very late stage in design it may be difficult to significantly alter some of the underlying features of the proposal. Some aspects of sustainable development are difficult to bolt on at the end of a project, and lack of integration may lead to reduced opportunities for sustainable development. Development control is also somewhat constrained by time. The guidelines indicate that the majority of planning applications should be resolved within eight weeks. This time constraint adds extra pressure and may mean that “non-essential” considerations will not be carried forward. The attitudes of development control officers to sustainable development will then be important.

Planning Obligations

The original Town and Country Planning legislation issued in the immediate post war period recognised that development of land increased the value of the land. The legislation proposed a tax on the increased value or “betterment” of that land. This tax would offset the negative impact of other local areas that may suffer some level of loss of value or blight. The aim of this tax was to control land values. In practice there has never been a successful enactment of this part of the legislation.

Following the end of the last scheme for recovering monetary benefit from development, the use of a negotiated planning gain had emerged during the 70s and 80’s. Local authorities sought to claim back some of the costs associated with the development, including road and infrastructure improvements. Planning gain has been defined:

A planning gain occurs when in connection with obtaining planning permission a developer offers, agrees or is obliged to incur some expenditure, surrender some right, or concede some other benefit which could not, or arguably should not be embodied in a valid planning condition. (DoE, 1981, p3)

Both developers and National Government had some misgivings about such an approach (Claydon and Smith, 1997). The Department of the Environment in 1997 moved to clarify and regulated the practice, through the issue of Planning Circular 1/97 (DoE, 1997b), which also renamed the procedure Planning Obligation.

LPA may negotiate planning obligation with the developer. In return for the loss of amenity or additional burden caused by a new development the LPA may request some contribution to ameliorating the impact. This may cover, for example improvements in roads and junctions near the site, replacement of lost local amenity by similar amenity at another site, improvements in infrastructure and community facilities or a percentage of affordable housing on a new housing development (Bunnell, 1995). There are a variety of means for negotiating some arrangement including;

- Unilateral agreements
- Section 106 agreements relating to the site (Planning Gain)
- Highways agreements

Government guidance states that planning obligations should be

- Necessary
- Relevant to Planning
- Linked to the site
- Reasonably related in scale and kind to the proposed development
- Reasonable in other respects

PPG1 recognises the usefulness of planning obligation but also states that planning authorities should not allow their development control decision to be swayed by the offer of extra inducements (DOE, 1997a). The use of planning obligations is still of some concern, since it

may place the planning process in questionable territory in relation to openness, scrutiny and potential for corruption (Reade, 1987).

2.3. Future Changes to the Planning System

Planning has provided a forum for strategic thinking and a means of engaging the public, which has been instrumental in protecting social and environmental assets. However there is recognition that the planning system is in need of reform. There have been calls for land use planning to be broadened to deliver environmental planning (RCEP, 2002, Blowers, 1997, Evans, 1997). The need to fully consider environmental information and to try to evaluate the capacity and limits of the local environment has been highlighted (Jacobs, 1997).

The planning system has been subject to changes in emphasis in policy with changing times and administrations (Reade, 1987 Chapter 2, Tewdwr-Jones, 1996 Chapter 1), but has retained, in essence, the same form since its introduction in 1947. The New Labour Government elected in 1997 has also made its mark on planning policy and process (Allemendinger and Tewdwr-Jones, 2000), not least through revitalised regional governance.

The current administration is in the ambivalent position of seeing planning as an important way of ensuring sustainable development, but at the same time seeing the planning system as slow and bureaucratic. In the Modernising Planning Programme (DETR, 1997) the New Labour Government sought to

- Include a European dimension in UK Planning
- More prescriptive planning policy on large scale planning applications, e.g. for infrastructure projects
- Effective regional planning

- Speed up the development plan process and the decision making process for individual planning consent
- Use of fiscal instruments to steer development

As part of the wider Modernising Local Government Programme (DETR 1998), planning has certain specific goals to achieve, monitored by specific performance indicators. These indicators particularly relate to the speed of resolution of planning applications; however the quality of the decisions is not monitored.

The clearest example of the conflict between allowing development and protecting the environment in recent years has been in the provision of housing (Allemendinger and Tewdwr-Jones, 2000). The predicted level of demand of housing is high particularly in those areas where there is little additional space for further development (e.g. South East). The Government has pursued a target of 60% development on brown field sites, but has not necessarily protected undeveloped land where brown field provision is available. Urban renaissance has been championed, but most of the population wish to live out of city centres creating tensions in the delivery of a coherent approach to housing (Breheny 1998).

The Government have recently considered a new piece of planning legislation that seeks to improve the planning process. The Green Paper “Planning: Delivering a fundamental Change” (DTLR, 2001) was delivered for consultation in early 2002. The green paper included some significant and in part controversial changes to the delivery of a plan lead system. Following the consultation (and a change in department) the policy document “Sustainable Communities – Delivering through Planning” was published (ODPM, 2002b). The new legislation was introduced as the Planning and Compulsory Purchase Bill in Parliament on 4th December 2002. The final Act is expected to enter into statute during 2003.

The Government has highlighted specific areas where it sees opportunities for improving planning (ODPM, 2002a).

- Improving the aspects of planning delivered by Government, in particular clarifying and improving policy guidance, dealing with called in applications and in the organisation of planning appeals
- Introducing a stronger regional aspect through Regional Spatial Strategies (RSS)
- Improving local planning through clearer local planning policy, improving the process of adopting a local plan, improving the speed and efficiency of development control.

The aim of these reforms is to give greater certainty in development and to improve the efficiency and speed of the process. The role of public participation and consultation is recognised as important, but consultation often leads to delays and additional time. The Green Paper “Planning - delivering a fundamental change” (DTLR, 2001) had sought to limit public consultation during public enquiries and streamline public consultation, but these proposals have been tempered in the final Bill.

The Government’s aim is to transform the planning system so that it is “*faster, fairer and more predictable*” and will help deliver Government objectives in other policy areas.

“An effective planning system is essential for delivering our objectives for living communities; for urban and rural regeneration; for improving the country’s infrastructure; and for achieving truly sustainable development.” (ODPM 2002a, paragraph 1)

A new local strategy, the Community Strategy, has been introduced under the Local Government Act 2000. The community strategy is intended to provide an overarching vision and set of objectives for an area and be developed in partnership with local stakeholders. The community strategy is expected to guide other local strategies and sustainable development is

supposed to have a central role. The new planning legislation highlights the role of the community strategy as a framework for the development plan, but it is difficult to see how this will work in practice, since development plans must be in conformance with National and regional planning guidance and any high level development plans. The vision of the local stakeholders may be at considerable variance with national guidance. Planning also has a specific quasi-judicial role, whereas the community strategy has no statutory force. There appears ample opportunity for conflict to arise if land use planning is, by following national guidance, at odds with the local vision.

It is not clear how the new planning legislation will improve on the delivery of sustainable development. The Government is relying on PPG to articulate sustainable development policy for land use planning, as is currently the case. Regional and local plans will be subject to sustainability appraisal, as is also currently the case. There is no mechanism for measuring or ensuring sustainable development is included as a prerequisite of planning permission. The new legislation is primarily concerned with the planning process and not the enactment of specific policy objectives. It will remain to be seen how far it is possible to pursue sustainable solutions through the new planning framework.

Chapter 3 Sustainable Use of Energy and Land Use

Planning

3.1. Drivers of UK Energy Policy

The current global predictions of energy use to 2030 (IEA, 2002) suggest that energy use is likely to grow significantly, with fossil fuels continuing to dominate the energy mix. World energy use is projected to grow at 1.7% per year up to 2030 (a slightly slower growth than seen in the previous three decades of 2.1% per year). Fossil fuels are set to remain the primary energy source, so greenhouse gas emissions are likely to continue to grow for some time, with an increase of 1.8% per year forecast, which equates to 70% more than today (IEA, 2002). The developing countries are likely to see the largest increases, but developed countries are still the main source of greenhouse gases. Indeed, in many developing countries a large proportion of the population will lack access to any source of electricity and will continue to rely on biomass for cooking and heating. While the earth's resources can meet the increasing demand, there are likely to be concerns about the security of supply as oil and gas-consuming regions will see their imports grow significantly. Transport is identified as the fastest growing sector of energy use.

UK energy consumption has increased; final energy consumption was 1.2% higher in 2001 compared to 2000 and primary energy consumption by 2% (DTI 2002a) and current trends suggest a continuing increase in UK energy demand. The UK has been in a very secure position in relation to primary energy with coal, oil and gas reserves. Indeed, the UK has been a net exporter of oil and gas. However oil and gas production have now passed their peak and are declining (DTI, 2001a). The UK is expected to become a net importer of gas by around 2006

and of oil in 2010 (DTI, 2003). This trend has been influenced by the large growth in demand for gas for electricity generation. Gas and oil supplies are then likely to be brought in from different parts of the globe, some of which may be at risk of disruptions through regional instability; hence security of supply may become an issue. Energy markets are international markets and any national energy policy must take due consideration of the international dimension.

Since the agreements on greenhouse gas emissions at the Earth Summit (UNCED 1992) and the following agreements at Kyoto, climate change is an increasingly important driver of policy that could require major changes in the use and generation of energy to reach the internationally agreed targets. The current UK targets, as part of the EU agreement, commit the UK Government to delivering a 12.5% reduction across a basket of 6 greenhouse gases up to the period 2008 to 2012 (DETR 2000a). This target will become binding on ratification of the Kyoto Protocol, which is expected during 2003. In addition, the Government has adopted a voluntary 20% reduction in CO₂ target by 2010. Table 3.1 summarises the specific greenhouse gases and their sources.

Greenhouse Gas	Source
Carbon dioxide (CO ₂)	Combustion of fossil fuels Land use change Cement production
Methane (CH ₄)	Agricultural livestock Landfill sites Leakage from the gas distribution network, and coal mines Rice paddies
Nitrous oxide (N ₂ O)	Non-livestock agriculture (e.g. agricultural soils and fertilizer) Nylon and nitric acid production Combustion
Hydrofluorocarbons (HFCs)	Halocarbon production Refrigeration Aerosols
Perfluorocarbons (PFCs)	Electronics industry Aluminum production
Sulphur hexafluoride (SF ₆)	Magnesium manufacture Electrical insulation

Table 3.1. The Kyoto Basket of Greenhouse Gases

Energy generation is a major source of greenhouse gases, particularly CO₂, which is the most abundant of the greenhouse gases from human sources. Thus, any action on climate change necessarily involves action on the use of energy. The agreements at Kyoto were seen as the beginning of a process to reduce the impact of human activities on the climate system and are expected to lead to an increasingly challenging set of targets in the future. Thus, the need to

reduce greenhouse gas emissions may become an increasingly important driver of energy policy and carbon may become an environmental currency.

The recent 22nd Royal Commission on Environmental Pollution report “*Energy – The Changing Climate*” (RCEP,2000) provides a challenging investigation into the future policy developments that would be needed to stabilise carbon emissions at a level that reduces the risk of dangerous human induced climate change. Stabilisation at 550 ppmv, suggested as an appropriate target, represents a doubling of the pre-industrial concentration and would require a reduction of around 60% of 1990 emissions levels by 2050.

The Local Government Association (LGA 1998) identified an energy hierarchy, in the same form as the well-known waste hierarchy, as a guide to sustainable energy use:

- Reduce the need for energy
- Use energy more efficiently
- Use renewable energy
- Any continuing use of fossil fuels to be clean and efficient for heating and co-generation

This hierarchy, with preference given to the earliest options, could provide a framework for an integrated energy policy, delivering a sustainable energy future, particularly if the emphasis moves from providing kWh of energy toward a process of charging for the services that consumers want, i.e. heat, light, etc. Energy supply companies would have more incentive to supply services as cheaply as possible, rather than sell as many units as possible.

In the recent white paper “Our Energy Future – Creating a Low Carbon Economy” (DTI, 2003) the Government has responded to these trends and drivers. The Government has identified specific goals for UK Energy policy:

- To put ourselves on a path to cut the UK's carbon dioxide emissions – the main contributor to global warming – by some 60% by 2050, as recommended by RCEP, with real progress by 2020;
- To maintain the reliability of energy supplies;
- To promote competitive markets in the UK and beyond, helping to raise the rate of sustainable economic growth and to improve our productivity;
- To ensure that every home is adequately and affordably heated.

(DTI, 2003 page 11)

It sees these goals being delivered primarily through competitive markets, with specific regulation or use of fiscal instruments only where the market cannot fully support Government goals (DTI, 2001b). A review of UK energy framework is included as Appendix A.

3.2. Delivering Sustainable Development through Energy Policy

The generation and use of energy has important implications for sustainable development across all of the objectives identified in the UK Sustainable Development Strategy (DETR 1999a).

- SD 1. Social Progress which recognises the needs of everyone
- SD 2. Effective protection of the environment
- SD 3. Prudent use of natural resources
- SD 4. Maintenance of high and stable levels of economic growth and employment.

National energy policy should help to deliver these objectives. As discussed in chapter 2, the Government has identified indicators to monitor the delivery of sustainable development (DETR, 1999b). The subset below (Table 3.2), related to energy production and consumption, should monitor national policy.

Indicator	Description	Target	Trend
H9¹	Emissions of Greenhouse gases	12.5% reduction in basket of greenhouse gases by 2008-2012 20% reduction in CO ₂ by 2010	Decreasing but expected to start increasing again
H11	Road Traffic	Reduction in rates of growth -10 year plan monitored by CFIT	Fastest growing contribution to greenhouse gases
A2	Energy Efficiency of economy	No specific target	Energy consumption per unit GDP falling
A3	Energy Use per household	No specific target	Little change since 1970
D3	Energy and Water Consumption per household	Indicator to be developed	
D8	Thermal Efficiency of housing stock	No specific Target	Increasing uptake of efficiency measures and improvements in new stock
D11	Energy Efficiency of new appliances	No specific target	Energy efficiency of appliances has improved, particularly since energy labelling (1994/95)
D15	Energy Efficiency of road passenger travel/ average fuel consumption of new cars	No specific target	80% increase in in fuel use and distance travelled 1970 to 1998 Average fuel consumption of cars improved during 1980, but remained steady since
D17	Leisure trips by mode of transport	No specific target	Leisure trips by car have increased, walking and public transport have decreased
D18	Overseas travel	No specific target	Large increase, particularly in air travel since 1983
D20	Freight transport by mode	No specific target	Increase in freight
D21	Heavy goods vehicle mileage intensity	No specific target	Larger lorries has lead to a decrease in HGV miles in relation to GDP since mid 60s

¹ Headline indicators are shown in bold

G1	Passenger travel by mode	15% increase in rail passenger miles between 1997/98 and 2001/02 double cycle use between 1996 and 2002	Since 1985 journeys by car have increased, journeys by other modes decreased, although total journeys remain about the same
G2	How children get to school	No specific target	Walking is still the dominant mode, but there has been a doubling in the number of children travelling to school in cars
G3	Average journey length by purpose	No specific targets	Journey lengths are increasing for all purposes
G4	Traffic Congestion	No specific targets	Congestion forecast to increase markedly
G5	Distance travelled relative to income	No specific target	People in all income bands are travelling further. Those in the highest income bands travel 3 times as far as those in the lowest
J6	Fuel Poverty	Install energy efficiency measures in 1 million buildings by 2002	Reduction in households in fuel poverty since 1991, but mainly due to improvements in household income and reduction in fuel prices
N3	Carbon dioxide by end user	12.5% reduction in basket of greenhouse gases by 2008-2012 20% reduction in CO ₂ by 2010	Fall in emissions for all sectors except transport, which rose 87%
N4	Energy from renewable sources	5% grid connected electricity from renewables by 2003 10% grid connected electricity from renewables by 2010	Increase in electricity from renewable energy sources since 1988
N5	Depletion of fossil fuels	No specific target	Estimated reserves have remained about the same as additional reserves discovered

Table 3.2. Sustainable Development Indicators relating to energy (*source Quality of life counts DETR, 1999b*)

3.2.1. Reducing CO₂ Emissions by 60%

A commitment to a 60% reduction in CO₂ emissions by 2050 helps to deliver on the objective for environmental protection (SD2), particularly in relation to climate change. This commitment may also help to deliver on SD3, but may impact negatively on economic growth (SD4) if excessive costs are incurred. Progress can be monitored through indicators H9 and N3.

The white paper (DTI, 2003) emphasises energy efficiency and renewable and this seems to show that wider environmental concerns are considered. However there is more to environmental sustainability than greenhouse gas emissions (Evans, undated) and nuclear is kept as an option, in spite of unresolved difficulties over disposal of waste and decommissioning of plant. Prior to publication of the white paper there was much speculation that nuclear would form a major part of the Government's strategy for reducing greenhouse gases. The reduced role for nuclear may be due more to its poor economic performance and security risks, than to its environmental risks.

The 60% target will be very challenging. Although the UK is one of the few countries to meet their commitments in the Rio agreement, returning carbon emissions to 1990 levels by 2000 this has been mainly achieved through favourable short-term trends, in particular fuel switching or the "dash for gas" that resulted from the initial market liberalisation. There has been little structural change in the energy supply industry that will be necessary to deliver these more challenging targets. There are doubts that Government's Climate Change Programme (DETR2000a) is able to deliver the 20% reduction in CO₂ target that the Government has adopted for 2010 (RCEP, 2000). Energy use in the domestic and transport sector are growing (DTI, 2002a). Gas and electricity consumption are also increasing, although energy efficiency gains have helped to decouple energy use from GDP in the UK (DTI, 2002b), although there are signs that the past savings in efficiency are reaching their end. Delivery of higher targets would require a step change to low carbon technologies and greater energy efficiency.

In order to support a move to a lower carbon economy, the Government has adopted targets for renewable technologies of 10% by 2010 and Combined Heat and Power (CHP) of 10,000MWe by 2010. The Government further aspires to target of up to 20% renewables to 2020. There is support for research and development into low carbon technologies. Programmes to encourage a greater uptake of energy efficiency and renewables have been identified and fiscal instruments have been used to support Government goals.

Whilst energy efficiency, CHP and renewables are now given greater emphasis, policy aims are intended to be delivered by the market, and these issues are not addressed in the current market structure. There has been action to remove some of the market distortions against CHP and renewables, but improvements will be needed if renewable energy is going to leap from 3% of grid generation now to 10% by 2010.

There are also gaps in the energy policy. Most importantly there is no consideration of heat as an energy source; heat has no market and no value. This distorts energy markets disadvantaging technologies such as CHP that provide heat and electricity; CHP is effectively stalled by high gas prices and low electricity prices. The concentration on grid linked renewable energy with little incentive for heat producing technologies, or stand-alone renewables, particularly in more remote locations. Gaps in policy and the failings of the market reduce the opportunities for energy policy to contribute to sustainable development.

3.2.2. Maintaining Reliable Energy Supplies

Maintaining reliable energy supplies is essential for delivering economic growth and stability (SD4). However there is a great reliance on gas as the main fuel for generation and transport throughout the energy white paper. Gas is a comparatively clean fossil fuel and the fuel switching in the 90's certainly helped the Government to deliver on its emissions targets. UK gas supplies are now in decline and new sources of gas will begin to be important. There may be a risk of disruption of supplies due to regional socio-political instability, which may impact on

the ability to maintain security of supply. The larger the reliance on a single fuel then the greater the risk of price shocks, which could impact on the economic growth (SD4).

Reliance on gas may also impact negatively on the prudent use of resources (SD3). The need to transport gas supplies for long distances across Europe and parts of Asia may have significant environmental costs at local and global level. The white paper recognised the role that indigenous renewable energy sources have for maintaining a diverse energy base and this may improve the opportunities for delivering on SD2 and SD3. The indicators N4 and N5 provide some information relevant to this policy objective.

3.2.3. Promoting Competitive Markets

Promoting competitive markets certainly helps to deliver economic growth and stability (SD4). Human social and economic conditions have been influenced by the availability of secure and cost effective fuel sources for many centuries (Fouquet and Pearson, 1998). Players involved in the competitive market are certainly engaged in producing energy as efficiently as possible, to maximise profits, so this should lead to prudent use of resources (SD3). The indicator A2 may illustrate this. However markets must maximise their sale of units of electricity or gas to make profit, so there is no incentive for suppliers to encourage consumers to consume efficiently, thus the prudent use of resources (SD3) may be threatened.

The environmental impacts of energy production are rarely part of the market structure (Fells, 2000), nor is there an agreed way of valuing environmental goods that are part of the “commons” (Pearce 1993) so effective protection of the environment (SD2) may be compromised in a competitive market. The trade in carbon nationally and internationally has given some market value to carbon, but current market structures may not support delivery of other environmental goals as easily. Many environmental groups have called for energy prices to be increased (FoE, undated) in order to make renewables and energy efficiency more

attractive. However there is some evidence that energy prices have to increase dramatically before there is a significant reduction in demand (Ram, 1995).

3.2.4. Ensuring Homes are Adequately and Affordably Heated

Ensuring that all homes are adequately and affordably heated helps to deliver SD1. However if this goal is mainly delivered through low prices, it will not support SD3, since there is no incentive to use energy efficiently. Progress can be monitored through indicators A3, D3, J6, D11 and D8.

The Local Government Association (LGA 1998) noted that people do not actually want to purchase units of electricity; they wish to purchase the services that the electricity provides, such as light, heat, cooking, etc. The sale of energy services would place the burden for efficient use of energy on the Energy Service provider. So it would be in the interests of the energy service provider to insulate a consumer's home to reduce the demand for units of electricity or gas. The White Paper recognises a role for energy services, but the current market again militates against the growth of companies engaged in supplying energy services. All consumers are entitled to change supplier with 28 days notice. Energy Service companies could not risk investing in expensive improvements, if a consumer was to move to another supplier before capital investment could be recouped. The DTI and OFGEM are investigating the current framework.

3.3. Integrating sustainable energy with the land use planning system

There have been many calls for land use planning to move towards environmental sustainability as a criterion for planning (see chapter2). Energy use has been identified as an important part of

any environmental planning agenda (RTPI, 1996). The form of development has implications for the use of energy in transport and building services.

All development, with a very few exceptions, is subject to planning permission. This covers new build, refurbishment and even change of use of a building. Thus the Local Planning Authority has influence on all development within its boundaries. Local Planning Authorities provide both the policy framework and the development control of individual projects as described in chapter 2. The role of land use planning in delivering energy objectives is limited. Land use planning has no role in delivering competitive markets or maintaining reliable supplies. It can influence the emissions of CO₂, and perhaps the provision of affordable warmth in homes. The location and layout of new development and the development of renewable energy installations are areas where there is a direct influence.

3.3.1. Site layout and design

The form and location of development has important implications for the energy consumption of buildings and transport. Buildings can be sited to make best use of ambient energy, important services, shops, schools etc., can be sited within easy walking distance of homes. “*Sustainable Settlements - A Guide for planners, designers and developers*” (Barton et al, 1995), gives much detailed information on site layout design for sustainability, including energy and transport matters. The key principles can be summarised:

- Access and Layout – minimising unnecessary journeys, improving accessibility for pedestrians and cyclists. If possible main residential roads should run East- West to improve solar orientation of buildings
- Orientation – where possible the long face of buildings should be orientated to be within 30° of south.

- **Overshadowing** – trees and other buildings should be far enough away to allow full solar access, thus allowing maximum amounts of daylight to reach the building. Deciduous trees will allow light to penetrate in winter, whilst providing welcome shade in summer, thus reducing overheating. Overshadowing caused by a sloping site should be allowed for with greater spacing, or the use of staggered building heights.
- **Microclimate** - local site microclimate can be improved by hedges, trees and fencing. These features can provide shelter from wind and rain, which is important for comfort in the open spaces. In addition buildings can be protected, reducing heat loss. Care must be taken to preserve the solar access (i.e. overshadowing).
- **New buildings** should, as far as possible, use materials that are as energy efficient as possible. This includes considering the energy expended in transporting materials to site. Policies on local supply should perhaps be considered. The use of higher standard energy ratings than current building regulations should encouraged, perhaps with zero CO2 housing championed as a local standard (DETR, Undated).

A holistic approach shows clearly the many interconnected influences of the different aspects of planning policy. Aspects of energy usage and reducing car usage have significant impacts on the local community across a range of social issues including, privacy, community building, community open space, crime and safety. These need to be considered carefully with any policies on greenhouse gas reduction through energy saving.

Energy demands for heat and energy services can be reduced up to 10% by careful siting and improvements to microclimate. Care in the design of layout can also lead to improvements in the general attractiveness of the site and in reducing crime. PPG1 (DOE, 1997) calls for good design in new developments and PPG3 (DETR, 2000b) supports this, calling on local planning authorities to reject planning applications for poorly designed developments. Development plan

policies that clearly define the necessary criteria for good design are needed; PPG3 also suggests that these should be supported by supplementary planning guidance.

Higher densities of housing development are generally encouraged within PPG3. (DETR, 2000b, paragraph 58). In general more densely packed housing is more energy efficient; flats and terrace housing are significantly more efficient than detached housing. In CHP for electricity and district heating is more viable in more densely packed developments. PPG3 for the first time suggests that local authorities should promote energy efficiency in housing where possible (DETR, 2000b, paragraph 56). This marks a change in the guidance since energy efficiency has generally been seen as a matter for building control, through building regulations.

High density development may undermine the appropriateness of passive solar design (PSD), which allows buildings to make the best use of any incoming solar radiation for day light and heating gains. Closely packed buildings tend to overshadow each other far more, reducing potential solar gains. However there may still be applications for PSD in less dense developments or through innovative feature such as roof lights. Indeed careful site design and choice of housing types can still allow good solar access (Barton et al, 1995). At present there is no specific support for PSD in planning guidance.

In general, now Government policy, through PPG, does call for new development to be easily accessed by sustainable means of transport. The development of “out of town” shopping centres, supported during the late 80’s and early 90’s, has largely been superseded by policy that calls for development which “*sustain and enhance the viability of town centres*” (DOE, 1996). Current policy suggests that services, shops, hospitals and leisure facilities, which generate a large number of trips should be sites in locations that maximise the opportunity to use alternative means of transport to the car.

Similarly, PPG3 suggests that in new housing development the need to create sustainable residential environments should guide local plan policy to identify sites that can give easy

access to a variety of services, such as jobs, schools and public services by modes other than the car. In the past land use planning has generally sought to segregate different land use types to avoid bad neighbour conflicts, current policy seeks to encourage mixed use development, where residential and non-residential development is in close proximity. PPG3 also suggests that the design of new housing developments should promote safer environments for pedestrians and give priority to pedestrians (DETR,2000b, paragraph 56)

3.3.2. Renewables

Renewable energy installations are generally at a much smaller scale (a few MW) than more traditional energy generation plant (1000s of MW). Electricity installation of less than 50MW are subject to planning permission from the LPA, larger installations are decided by central Government, with the LPA as consultee. Current Government guidance on renewables is encompassed in PPG22 (DoE, 1993). PPG22 provides guidance on renewable energy technologies, their land use requirements and their potential impacts locally, these are summarised in Table 3.3.

LPA are expected to include policies on renewables within their development plans. The number of renewable installations has grown in recent years, but many planning authorities have had little or no first hand experience of some renewable energy technologies. Other LPA have had a number of developments in quite close proximity raising questions of cumulative impact. Over the last 10-15 years most LPA have included some sort of policy on renewable energy within their development plans and the remaining are likely to include new policies as the plans come for review. However the precise wording of planning policy can vary widely from a general statement of encouragement to a more specific criterion based policy. The development plan is the key document during the decisions on any planning application, and the interpretation of policy provides a basis for any decision or appeal. There is evidence that supportive policy eases the way for renewable installations (Cradick, 2000).

Renewable Energy Technology	Main technology requirements	Development Control considerations	Information useful to Development control	Possible conditions to impose
Large Scale wind (>2 turbines)	<ul style="list-style-type: none"> Well exposed windy site Hills and ridges preferred Close to electricity grid 	<ul style="list-style-type: none"> Visual impact Noise Electromagnetic interference Cumulative impact 	<ul style="list-style-type: none"> EIA Photomontage Noise and electromagnetic interference forecasts Turbine technical information 	<ul style="list-style-type: none"> Full site restoration after decommissioning Conditions on future development Substation buildings in keeping with local architecture
Small Scale Wind (up to 2 turbines)	<ul style="list-style-type: none"> Reasonably exposed site away from buildings Close to point of use 	As above but any impact would be much smaller and confine to near by	Information on chosen turbine	<ul style="list-style-type: none"> Full site restoration Consideration of near neighbours
Hydro	<ul style="list-style-type: none"> Drop of water of a number of metres Area for water reservoir Turbine building 	<ul style="list-style-type: none"> Visual impact Noise Interference with other river uses Interference with fish 	<ul style="list-style-type: none"> EIA Reports on fish stocks Technical info on turbine 	<ul style="list-style-type: none"> Turbine building to be in keeping with local buildings Special features for fish (e.g. fish ladder)
Waste Incineration	<ul style="list-style-type: none"> Steady waste supply Storage for waste for a number of days Proximity to grid 	<ul style="list-style-type: none"> Traffic movements Noise Emissions Smells 	<ul style="list-style-type: none"> IPC EIA Forecast traffic movements Technical information on any machinery 	<ul style="list-style-type: none"> Traffic movement curtailed in unsociable hours Storage facilities to be well designed <p>Changes to road layouts to accommodate traffic</p>

Landfill Gas	<ul style="list-style-type: none"> • Methane gas from waste site • Proximity to electricity grid 	<ul style="list-style-type: none"> • Hazardous material • Smells • Noise 	<ul style="list-style-type: none"> • EIA • IPC 	Removal of all plant on decommissioning
Biomass	<ul style="list-style-type: none"> • Steady supply of Biomass • Proximity to Grid • Storage 	<ul style="list-style-type: none"> • Hazardous material • Smells • Noise • Traffic movements 	<ul style="list-style-type: none"> • EIA • IPC • Information on traffic movements 	<ul style="list-style-type: none"> • Traffic movements curtailed in unsociable hours • Buildings in keeping with local buildings
Solar Heating	South facing roof based collector	Visual impact		Restrictions in conservation areas
PV	South facing roof or wall mounted collectors	Visual impact		Restrictions in conservation areas
Passive Solar Design	Good Solar Access	Visual impact		

Table 3.3. Planning Considerations for Renewable Technologies (source PPG22)

Specific planning policy can be further supported by the use of Supplementary Planning Guidance (SPG). SPG may be considered as a “material consideration” in the planning decision process if it is properly adopted as a supporting document for specific policy. Some LPA have produced SPG on renewable energy, for example Leicester City Council (2002). SPG can provide much clearer guidelines on the acceptability of certain technologies in specific locations. As SPG should be adopted in consultation with all stakeholders, it should reduce the uncertainty of the planning process for developers and local stakeholders.

In the UK, renewable generation has received support under the Non Fossil Fuel Obligation (NFFO). Early studies suggest that some LPA were quick to grasp the wider economic benefits of renewable energy (Hull, 1995) but subsequent experience particularly for wind farm developers suggested that obtaining planning permission was considered a barrier to renewable energy development. However, some recent research on renewable energy installations contracted under NFFO indicated that 89% of developments that have applied for planning permission have obtained planning permission (Cradick, 2000). Other work suggests that this figure is nearer 70% when landfill gas is excluded and the information is analysed according to Declared Net Capacity (DNC) (Hartnell, 2001). There are still over a third of contracted projects that have not reached planning stage and whilst planning was suggested as a barrier for these projects there may be other issues, including finance, which hindered development.

The nature of NFFO as a competitive instrument may have contributed to conflict with the planning system. Projects contracted under NFFO did not need to consider planning issues as part of their proposals. For some technologies, the need to maximise the return on their investment has pushed them to develop contentious sites, which may be highly valued by local communities (Mitchell, 1996). Developers have consulted with local communities with varying success (Devine-Wright et al., 2001). The DTI database of all grid connected renewable projects indicates that there is significant variation of planning success across renewable installation

type. Table 3.4 shows the percentage of applications that have been approved for each technology type.

Renewable Technology	% Approved out of total determined
Biomass	88.2%
Landfill gas	99.6%
Large Wind	63.9%
Small Wind	72.5%
Hydro	92.9%

Table 3.4. Numbers of Renewable Energy Installations receiving planning permission.
(Land Use Consultants, 2002, *Source DTI Renewable Energy Monitoring Database*)

This shows considerable variation across the different technologies. It should be noted that this data is percentage of those projects that actually applied for planning permission; other projects may have stalled before submitting an application based on officer feedback. However it is clear that some technologies are progressing through the planning process with apparent ease.

Landfill gas has a particularly high success rate, but landfill gas is based at sites of low public value (i.e. landfill sites) which are often remote and out of public sight. The landfill sites already have some industrial activity and so may not be so contentious. However both biomass and hydro have high success rates, yet there are opportunities for conflict with local communities. Wind is clearly the least successful at progressing through the planning system, with larger installations even more contentious than small projects.

Planning concerns have traditionally restricted rural development, since the need to conserve the environmental quality has been considered more important in rural areas. Many renewable installations constitute an industrial type of development in rural areas, although early guidance

from the Secretary of State on wind installations indicated that they should not be equated with industrial developments (Hull, 1995). Land use planning seeks to preserve the “natural landscape” and plan policy has been used to protect local landscape against industrial scale development such as high voltage electricity installations (Jay, 2001) using sustainability to support decisions. The potential for conflict in renewable installations is apparent.

The newly devolved administrations in Scotland, Northern Ireland and Wales, together with voluntary Regional Assemblies in England have been charged with developing targets for renewable energy within each region as part of a Regional Sustainability Framework (Oxera, 2002). However the target relates only to grid connected renewables and there is no corresponding target for non-grid connected electricity generation, or non-electricity generating renewables, such as solar water heating. Indeed as identified earlier there is a serious lack of any policy relating to heat. Although regional bodies are being asked to set regional targets, these will need to be delivered and approved at local authority level.

Regional bodies and local planning authorities need to carefully consider the scale and types of renewable that they feel are suitable for their local area. Resource assessments for most areas have been completed and are available through Future Energy Solutions (FES). These resource assessments allow local planners to assess the location and type of renewable that may be suited to their local area. Most regions have used these resource assessments to provide renewable energy targets, which were included in the Regional Sustainability Framework documents submitted to the Secretary of State in December 2000.

Local plan policies need to be framed to encourage the renewable technologies that are seen to be appropriate to the area. The recent study for the East Midlands review of RPG concluded that only wind energy needed a specific siting policy (Land Use Consultants, 2002) with broad areas identified as suitable or unsuitable for turbines. Some planning authorities prefer to highlight where renewable installations will not be permitted, for example in Areas of Outstanding

Natural Beauty (ANOB). Some form of strategic approach, specifying both the type and scales of renewable installation that are acceptable may be advisable since clear and specific policy is less likely to lead to conflict and confusion when a specific proposal is lodged.

The development plan process and Government policy have advanced significantly since the publication of PPG22 (DOE, 1993). The current policy guidance in PPG22 has not always been strong enough to provide a suitable framework for development plan policy or for development control decisions. In addition the whole thrust of PPG22 is toward large-scale grid connected electricity generation schemes. There is little guidance on small-scale schemes or non-grid connected, or non-electricity producing renewables e.g. solar water heating. This lack of policy guidance has had an impact on renewable energy development plan policy formulation and thus on renewable energy developments in the UK. PPG22 has been identified as guidance in need of review and the review is due to occur during 2003.

3.3.3. CHP and District Heating

Combined Heat and power (CHP) is a more efficient means of generating electricity since the heat generated is also used. CHP units can be around 80% efficient, in comparison to around 40% for traditional energy generation. Once again government policy is encouraging the deployment of CHP.

CHP is less attractive financially if there is no market for the generated heat as well as the electricity. However the distribution of heat requires dedicated infrastructure in the same way as any other service, such as water or gas. Planning Authorities can act proactively to encourage the development of this infrastructure, in the same way as other agreements regarding infrastructure are made. Provision of the infrastructure at the earliest stages is obviously much more cost effective.

Planning authorities need to have a strategic view of the opportunities for CHP in their area. They can then devise policy to encourage the provision of CHP and heating infrastructure where it is most appropriate. They can also act to encourage CHP in suitable developments, particularly leisure facilities, hospitals and factories. Recent government policy encourages mixed use developments as a means of encouraging more sustainable development. These sorts of development are particularly suited to CHP and the early provision of infrastructure can improve the viability of CHP projects.

Chapter 4 The Role of Tools in Planning for Sustainable Development

4.1. The Need for Tools

As discussed in chapter 2, sustainable development is an overarching principle that can be difficult to define. Even with agreed working definitions it could be difficult to assess the impacts of a policy or action across all of the themes of sustainable development. Sustainable development must be delivered across policy arenas and be integrated. A policy or action that helps to achieve environmental sustainability may impact negatively on economic viability or social justice. It is also possible for policy gaps to occur, leaving some important aspects of sustainable development unsupported in the policy framework and then disadvantaged in any planned actions.

In chapter 2 we also saw that land use planning has been identified as an important policy area for delivering sustainable policy and action. In particular, planning may offer an appropriate scale to reintegrate national policy across many sectors, and ensure that sustainable development objectives are fully covered, by local policy. However integration of policy goals across different groups can be difficult (Barling et al, 2001) and organisational and political structures do not always support integrated working (Valler and Betteley, 2001).

There is therefore a role for specific tools to help in both the development of policy and the enactment of policy. Tools have been developed or adapted to support different aspects of land use planning. These tools range from generic advice and guidance to sophisticated computer based assessment tools for specific applications (e.g. Rylatt et al, 2001, Cooper et al, 2001). It is

beyond the scope of this study to review these more sophisticated tools, however it is clear that these tools are often too specialised for the planner to use routinely and would more likely feed into any planning process through consultants' reports or consultations with other LA departments.

Guidance relevant to planning has been produced by Government departments and agencies, and also by local government bodies such as the Local Government Association (LGA) and Improvement and Development Agency (IDeA). Specific groups, such as Council for Protection of Rural England (CPRE) and the Royal Society for the Protection of Birds (RSPB), often produce advice for developers and planners. Government agencies such as Environment Agency, Countryside Agency and English Heritage also provide advice and guidance. In addition the responses of these bodies as consultees to both plans and individual development proposals can have significant weight in the planning process (Wood and Jones 1997).

The tools reviewed here are directly relevant to the planning process. For the most part they are tools that already have a specific role in some part of the planning process, or are closely allied to specific elements of the process. Planners would be familiar with most or all of the tools discussed here.

4.2. Tools for Policy Development

4.2.1. Strategic Environmental Assessment and Sustainability Appraisal.

Strategic Environmental Assessment (SEA) is a tool that has developed from Environmental Impact Assessment (EIA). EIA had its origins as a regulatory process in the National Environmental Policy Act (NEPA) of 1969 in the USA. EIA was designed to evaluate the environmental impact of individual projects. SEA was introduced as a means of addressing some of the weaknesses of EIA. As a project based tool EIA cannot fully consider cumulative

impacts, or the possibility of alternatives (Benson, 2001). EIA is reactive, SEA of plans and policies can anticipate individual projects and put in place a policy framework that guides projects to appropriate locations (Glasson 1995).

Therivel (1992) suggested that an SEA should include:

- Determining the need for an SEA
- Determining Objectives for the plan
- Defining scope of SEA – impacts addressed, spatial location, alternatives
- Setting up an environmental database
- Evaluating impacts
- Proposing recommendations
- Monitoring

SEA has been adopted and used in many countries. SEA has also been suggested as a tool for assessing wider sustainable development impacts. However evaluating impacts across different value systems, i.e. social, environmental and economic is difficult. Assessment should generally involve setting a monetary value on the impact, through avoidance costs or substitution values, for example, but social costs are often very difficult to evaluate. Indeed the assessment process, even when evaluating costs and benefits, is still open to value judgement as part of a political process (Weston, 2000). In the UK SEA has been applied as a less rigorous appraisal methodology. Evaluation of impacts is reduced to an indication of direction i.e. positive or negative.

The Department of the Environment indicated that it wished to see an environmental appraisal of development plans in 1992, in the first revision of PPG 12. To aid local authorities a good

practice guide was published (DoE 1993b). The guide provided a methodology for evaluating the environmental impact of plan policies, together with an assessment of policy compatibility.

Performing an environmental analysis (EA) requires certain information to be gathered and certain evaluations to be made. The good practise guide suggests a three-step process.

- Characterise the Environment – identify environmental and assess stock
- Scope the plan – Identify current policy guidance
- Appraise the plan content

The characterisation of the environment provides baseline information that informs the plan policy. Important local assets can be identified and protected and overall stocks can be maintained. Stocks can be assessed using other tools such as ecological footprints (for example Simmons et al, 2000 Guernsey or Barrett et al., 2002 York) or inventories of Greenhouse gases (Mander et al undated NW inventory, Fleming et al, 2000, EM inventory). Eco-footprint provides a tool that has resonance with the public and relates policy to the public. Inventories provide a suitable baseline to monitor policy actions. Data quality and availability can be an issue in all assessments.

Scoping ensures that the development plan covers the appropriate policies and proposals. The process of scoping should ensure that the development plan is consistent with National Government policy and guidance. This can be difficult if policy is changing rapidly, or is being reviewed. The scoping stage should also consider the setting of targets and standards for environmental issues in the area plan. The various local planning authorities have scoped their plans to different levels of detail. Some have looked only at PPGs or Government white papers; some have entered into partnership with other neighbouring authorities, whilst some have been very comprehensive (Therivel, 1995a).

At the very heart of the EA is appraising the content of the plan. This may be approached in a number of ways. A structure plan at county level deals with strategic objectives and spatial strategy. These may be appraised. Specific policies and proposals, perhaps more relevant to a local plan, may also be appraised. A compatibility matrix can be used to ensure that objectives across policy areas are consistent. A policy impact matrix can be used to investigate the impact of policies in a consistent manner. The judgements on the issues raised are necessarily subjective. In reality there will be conflict across policy areas and judgements will be necessary (Bérube and Villeneuve, 2002). For example new road schemes may score poorly in the EA but the authority may have good economic and social reasons for pursuing them. The strength of the EA is that these issues are highlighted at an early stage and alternative less damaging policies may be achieved. Failing that the environmental impact may be lessened by some complementary policy changes. For example new road development may be linked to better public transport provision, cycle pathways and improved pedestrian access, ameliorating the negative impact of the policy. In fact any EA process will be iterative appraisal of the plan should be followed by consultation and reappraisal, monitoring and reappraisal. This fits in with the process of producing a development plan, as this too is open to consultation and comment.

The process for appraising the environmental impact of policies is easily adapted to a full sustainability appraisal. Indeed Therivel (1995b) in her working paper shows many examples of Local Authorities who either linked sustainability from the first appraisal or who highlighted the opportunities for future appraisals. Hertfordshire CC introduced many none environmental issues into their appraisal, concentrating rather on sustainability (Therivel 1995b pp31-36). West Sussex CC highlighted the possibility of extending the EA procedure to Agenda 21 (Therivel 1995b pp41-47). Appraisal is potentially a powerful tool for developing sustainability at the heart of policies and the Government has supported the role for a wider sustainability appraisal.

Local planning authorities have been called to include sustainable development at the heart of their development plans. The need for well prepared plans, with clear objectives and appropriate monitoring of those objectives through indicators and targets has been identified (DETR, 1998b). Sustainability appraisal has particularly been identified as a tool for RPG (DETR, 2000). The rigorous evaluation of costs and benefits is replaced by assessment of the direction of the impacts together with a robust monitoring scheme that measures the progress towards specific targets. The appraisal process should identify any gaps in the policy framework, which should also help to identify where further monitoring is required. In practice gaps and inconsistencies may occur, but the appraisal means that there is awareness of these shortcomings in the plan (Smith and Sheate, unpublished). However there is a need to ensure that environmental concerns are not sidelined by pressing social and economic concerns. Recent discussions on this issue (DETR, 1998c) suggest that the starting point should be the precautionary principle for maintaining natural capital and avoiding environmental damage. So far this approach has proved contentious when planning authorities have used it to restrict development (Counsell, 2002), but it may have a role in protecting important assets.

Studies of local authority plan preparation in the light of the guidance suggested that whilst a large number of authorities were attempting appraisals, nearly a quarter of authorities were not intending to appraise their plans at all (Therivel 1995a). An even larger number were at the “planning or thinking about an appraisal” stage. District level authorities seemed less likely to perform an appraisal. Even where an appraisal was performed it often fell short of the guidance (Winter, 1994). Those authorities that performed an appraisal of their plan have generally found it a useful process (Therivel 1995b), but costly and time consuming. Later studies suggest that around a quarter of authorities are still not carrying out any appraisal (Hale 2000), with a large number only partially following the guidance. The revised PPG12 (DETR, 1999c) strengthens the requirement for an environmental appraisal and suggests that authorities should seek to perform a fuller sustainability appraisal as suggested for RPG (DETR, 2000c). Local

Authorities are now expected to submit an environmental assessment with their draft plan to the Secretary of State. However local authorities rarely receive any feedback on the environmental appraisal leading to a danger that this process will be merely a token gesture and findings not fully incorporated into the plan process.

In the light of current developments, including a new EU directive (2001/42/EC) on Strategic Environmental Assessment, it is likely that appraisal will continue to increase in importance in the plan preparation process. Appraisal can be valuable in improving plan policy and it is also useful in itself as a process of raising awareness of the cross policy implications for sustainability amongst decision-makers. The increasing use of indicators together with the emphasis on government targets may perhaps provide a further driver for a sustainability appraisal, as method for evaluating all the different issues more effectively.

4.2.2. Environmental Capacity

The use of environmental capacity assessments has been suggested as a means of enabling the planning system to help achieve sustainable development, through the identification of local environmental assets and their value. Constraints to development in certain areas could potentially be identified based upon the ability of the environment to accommodate the impacts of the development and associated activity.

The idea of environmental capacity comes from the Malthusian ideas of ability of an area to support a population. Thus the environmental capacity of an area of grazing to support a population of grazing animals, without degradation, is easily assessed. Humans can to a large extent avoid the problems raised by environmental degradation through technical and organisational solutions to local problems, for example humans rarely rely on local food production or waste disposal, which means that the environmental capacity is less easy to assess.

The principle of environmental capacity in relation to human development is that key environmental capacity can be identified, potentially categorised, and then protected through conservation or substitution, for future generations. The ability of humans to displace or avoid environmental problems means that local environmental degradation is not a simply measured scientific parameter, social and cultural issues are also important in assessing environmental capacity. Thus the definition of environmental capacity is more subjective, and may vary as values change (Jacobs, 1997). Environmental capacity can provide a useful tool for planners and communities in defining local environmental capital and the role of local community participation in identifying and valuing environmental capacity is important.

However, although the tool has many attractive features it has been criticised for potentially encouraging NIMBYism within the planning process (Rydin, 1998). This aspect of the tool has important repercussions for the principle of equity within sustainable development. Use of environmental capacity may lead unpopular or Locally Unwanted Land Uses (LULUs) being pushed to less empowered communities (Blowers 1997b).

The concentration of environmental capacity is on local environment, which does not necessarily allow for global issues, such as climate change, to be well addressed. The effect of environmental impacts that move from one area to another, such as acid rain, may also not be well treated. There is no absolute scale of values, the recognised subjective nature of the tool means that value judgements of very different communities may define very different assets. This gives the potential that globally or nationally important assets are lost.

Environmental capacity is envisaged as a strategic level tool. Environmental capacity can be seen as input in the plan preparation stage and informing the environmental appraisal of the plan. However at present it forms no material part of the plan or development control process. Indeed, the use of environmental capacities as tool to guide the minerals plan for Berkshire in 1993 was rejected by the Inspector, particularly in relation to absolute areas of restriction. The

key objections were the subjective nature of the approach and the lack of support in national policy or common usage of the approach (Cowell and Owens, 1997). This conservative approach to new tools will always place some restriction on their uptake until endorsed by Government guidance. Work has continued on the environmental capacity approach, with a new methodology from the Countryside Agency, Quality of Life Capital, designed to extend the approach to a wider sustainable development framework.

4.3. Tools for Policy Enactment

4.3.1. Supplementary Planning Guidance

Supplementary Planning Guidance (SPG) has a specific standing in the delivery of land use planning policy. It is designed to support planning policy in the development plan and where it has gone through a process of consultation it can carry weight as a material consideration in the development control process. To be most effective it must be closely related to the policies within the development plan. SPG allows the local planning authority to elaborate on an issue and highlight how developments can be fulfil the requirements of the development plan.

Various local authorities have used these as tools to support policies on sustainable development (Leeds City Council, 1998, Lincoln City Council, 2000). A model SPG, developed by the author for a training event for planners, is included in Appendix B. This model SPG covers issues relating to sustainable energy use, it has since been adapted, by the author, for Leicester City Council, who now published specific guidance on energy (Leicester City Council, 2002)

Design briefs for a specific area can also be used to inform developers. These provide a master plan for a specific area and will cover the issues of importance in the development of that site. Design briefs are often used for conservation areas and also for large new development areas. Design briefs would typically include information on urban design, road layout, transport

choice, passive solar design of buildings, water drainage schemes, crime prevention and social inclusion. Not all of these issues are directly related to land use, but the use of the master plan allows a more integrated approach. Barton et al (1995) provided a guide on the issues to consider in specific site developments. More recently Barton et al (2003) provided a guide to planning for communities that covers a wider remit than land use planning, but could be a useful tool in developing community strategies.

4.3.2. Environmental Impact Assessment

Environmental Impact Assessment is a statutory requirement for most large-scale developments. It was initially introduced under a range of different regulatory instruments to meet the requirements of EU directive 85/337 (Bond 1997). The requirement for an EIA (often referred to as EA in the UK) to cover new development was included in *Town and Country Planning (Assessment of Environmental effects) Regulations 1988*. This has now been superseded by *Town and Country Planning Regulations (Environmental Impact Assessment) (England and Wales) 1999* in response to the updated EU directive 93/11/EC.

The EIA is intended to inform decision-makers, i.e. developers and planners, of the likely impacts of the development on the environment. The results are presented in an Environmental Impact Statement (EIS or ES). The EIA is generally undertaken by environmental consultants, acting on behalf of the developer and should inform the decisions taken by the developer. The EIS should be submitted with the planning application for information to the planning officer when deciding the planning application. The EIA should include specific information including

- Description of development and environment
- Identification and assessments of impacts
- Suggestion of Alternatives

- Suggestion for monitoring and mitigating impacts.

Since the implementation of the regulations controlling EIA there have been a large number of developments that have fallen under the regulations (Wood, 2000). In spite of the improvement in the quality of the EIS submitted over this time there are still areas where EIS are less than satisfactory (Glasson et al, 1997). In particular many EIS still do not include a consideration of alternatives or propose mitigation and monitoring schemes. In addition EIA should generally include an element of public participation, this is often reduced to a mere procedural exercise in most cases. Developers often fear that public input will delay or stop the development (Shepherd and Bowler, 1997). This lack of meaningful public input may reduce the benefit the EIA process (Benson, 2001).

Although EIA implementation has been handicapped by a piecemeal approach in the UK, it has been argued (Glasson 1999) that it still has considerable potential for ensuring the inclusion of environmental considerations in the planning process. Most planners are now likely to have to deal with a number of EIA during their career. Research has suggested that planners give comparatively little weight to the EIS when making their evaluation of a planning application (Wood and Jones, 1997). The value of consultation with bodies such as English Nature was generally given more weight. This may be due to the fact that most planners however are not environmental experts and so their ability to judge and evaluate the findings of the EIA may vary. If so the weight given to the EIS may increase as planners become more familiar with the information.

Wood and Jones also found that most planners felt that the EIA had not influenced the final decision, although some minor modifications may have been included. It seems unlikely that the majority of developments were as good as they could be at mitigating environmental impacts, so this trend is also disconcerting if sustainable development is to be possible through the land use planning process. It may be that planners need to be given some training in assessing EIS and

using it to facilitate more sustainable development. The EIS may be a material consideration in judging a proposal, but if planners and inspectors afford it little weight it will generally be ineffective.

4.3.3. Public Participation

To deliver sustainable development there must be a high level of participation from the public. This is not just because participation is part of the democratic process, but also because participation can improve policy outcomes (Rydin, 2000). Engaging the public not only ensures that societal values are reflected, but opportunities arise to build social capital and reduce potential conflicts. Consensus building is seen as an important way of building social and institutional capital (Healey, 2002). This capital can be vital in taking forward Sustainable development (Devine-Wright et al, 2001). Although some argue that consensus amongst all parties is not possible and strategic alliances may better deliver on sustainability objectives (Naess, 2000)

The planning process includes public participation statutorily. Any development plan is put out to consultation for a period of a few weeks and objections accepted. Planning permissions are published in local papers and on council lists and near neighbours are generally informed. In practice this is a rather passive form of participation and few members of the public actually are aware of the planning process and rarely become involved. However if a controversial development comes forward, then local groups may become vocal and well organised and are often well versed in current planning guidance. At this late stage the focus tends to be rather adversarial.

Often when participation exercises are developed they fail to reach many constituents of the local neighbourhood. There are specific tools that have been used to encourage wider public participation. These include

- Planning for real
- Citizens juries
- Standing panels
- Community issues groups
- Consensus conferences
- Village Design Statements

All of these allow for some structured input from ordinary members of the public into the planning debate. Some are appropriate at strategic planning stages, others more easily used for specific planning proposals. However Rydin (2000) makes clear that to encourage participation the public must see clearly the benefits of the action and are less likely to be engaged by processes where they seem to have no real impact as measured locally and speedily.

Local Agenda 21(LA21) has also been a positive influence on public participation in the planning debate; with opportunities to feed into the planning process at all levels (Hales, 2000). However the focus of LA21 is often quite different to the planning system, particularly in view of the planning system's narrow focus on land use issues, and the specific statutory elements of the planning process. This has often left the planning process unable to accommodate the suggestions and ideals of the LA21 process.

4.3.4. Checklists

Appraisal techniques used for policy are not immediately applicable to development control decisions, but the principle of assessing development against a range of sustainability criteria seems sensible. The Government have produced a checklist (DETR, 1998e). More recently a detailed check of neighbourhood sustainability has been produced (Brownhill and Rao, 2002)

which allows for a development to be given a score. The scoring technique is obviously subject to the value judgement of the assessors, but scoring gives some ranking to the development and low scoring developments are more likely to be improved.

Some local authorities have sought to provide tools to development control to help them assess the sustainability of proposals. Leicester City Council and Epsom Borough Council have produced checklists to help assess an individual project against sustainability criteria. These checklists are generally produced outside of development control, either by strategic planners or through community action such as LA21. Development Control may have no feeling of ownership and so consider these tools merely extra unnecessary work. Further these documents have no statutory position or weight and would merely inform the individual officer. Unless the output from the use of these tools could be included as a material consideration, the results may have no influence on development.

4.4. The role of the planner

The planner is only one of a number of property professionals involved in the process of development (Greed 1996, Healey 1998). Different professionals often have very different goals in the development process (Rydin, 1997). Planners however are involved in developments from the smallest extension of a house to the largest new settlement and even the change of use of a building. Planners also see each development within the wider local context; thus they have a role in defining the framework for urban design including matters of conservation and demolition.

Through out the 19th century planning has undergone a number of changes of strategy and purpose (Greed 1996, Reade 1987, Tewdwr-Jones 1996). Planning has been historically been rooted in social improvement and community values (Rydin, 1997). However, whilst the role of planning as a profession has become accepted, many now acknowledge that there is little

theoretical basis for determining the organisation of land use (Reade 1987). Thus planning cannot, of itself, deliver good urban design or the best use of land, but is rather an enactment of land use policy and as such is a public policy process, in the same way as any other area of Government policy (Evans 1997). Thus the role of planning in delivering sustainable development is also related to the Governments public policy goals.

Planning professionals within local authorities have two specific duties under land use planning legislation:

- Strategic planning – concerned with preparation of local land use policy and plans
- Development Control – concerned with individual planning permissions

In general these two roles are separate, often not even within the same department, however in smaller local authorities they may involve the same personnel. In larger authorities there may be other personnel with roles that may be closely related to planning, such as urban design, Local Agenda 21 and community planning and regeneration who may have input into policy and development decisions. In addition there will be many other professionals within local authorities who are closely involved in development decisions, including lawyers, surveyors, property managers, building control, architects and many others. All of these professionals may be called on to advise the locally elected council members on appropriate land use policies and decisions within the current national policy framework.

Planning officers have a variety of tasks to fulfil as part of their job. These tasks differ depending upon the role of the planner and the type of authority but can be split thus:

- Strategic Planners
 - Providing clear and balanced policy framework
 - Advising the Planning Committee

- Facilitating conflict resolution
- Development Controllers
 - Judging and balancing social, environmental and economic benefits and costs of the development to the local community
 - Advising the Planning Committee
 - Negotiating settlement with developer
 - Facilitating conflict resolution

These different tasks require a variety of different skills and knowledge (Briassoulis, 1999). The development of policy and judging developments require a thorough knowledge of Government policy and guidance. There is also often a need to assess technical and scientific information from a variety of sources to either help with policy formulation or to support decisions on policy or development (Stephenson, 1998). The planning committee are responsible for the actual decision on any development, but the planning officer must provide them with a report on the proposed development, together with a recommendation of the possible decisions based on current national and local planning policy. Planning officers need to be able to effectively communicate and perhaps advocate certain actions. Planning officers may also need to understand and operate within the local political framework (Briassoulis, 1999). Facilitating negotiation between developers and the council (as representatives of the community) involves a wide range of skills, including mediation, bargaining and managing the process (Claydon and Smith, 1997).

Planning is based on some form of consensus on the form of development in an area. Planners are responsible for managing the process of preparing local plans; this involves consultation with the wider community. Development control decisions are also open to comment by the

wider public. Where difficult or controversial decisions are required conflict between different groups can arise. Consensus building and conflict resolution require a range of communication and advocacy skills. When these skills are applied it can lead to a growth in institutional capital (Healey, 1996), which can improve the local planning process.

Planning is largely discretionary, so the values of the planner and the local community help to form the framework for decision making. Planning is also largely political, since elected members of the council make decisions on planning policy and permissions (within the accepted national and local policy framework). The political element brings in a different set of values and judgements, which are not necessarily led by “good planning”. The planner operates within this complex framework and has to use many different skills to deliver.

Planning has often been criticised as reactive. Recently the present Government has called for planners to invoke a more proactive approach to encourage the right kind of development, rather than reacting negatively to development (DETR, 1997). Sustainable development calls for new ways of thinking about development, making connections across the separate themes of social, environmental and economic needs, with equity for different communities and the needs of the future generations considered.

It has been argued that the spatial realm provides an appropriate arena for the integration of policies across different policy areas (Vigar and Healey, 1999). However, planners would need to be able to think creatively to make these connections (Higgins and Morgan, 2000). Current planning practice does not always facilitate innovative approaches; time and resource constraints are frequently quoted as barriers as is the fear of lengthy and costly appeals against decisions (Hales 2000). Local authorities generally look to minimising their risk during the planning process. Additionally any development is generally well advanced by the time it reaches planning permission stage, which means it is more difficult to include large scale changes.

The tools discussed here can help with the delivery of a more integrated approach to sustainable development and can support policy on sustainable development. However tools alone cannot deliver, the role of the planner is vitally important. Planners are most likely consider policy and development in the light of Government guidance, where this is weak there is less incentive to include possibly controversial policies in plans or to support policies in the face of opposition. There are cases of more sustainable developments with innovative land use solutions being facilitated across the country and planners have played an important role in some of these solutions, often working in partnerships with communities, developers, architects and others. In these cases planners often have better knowledge and awareness of sustainable development and are committed to sustainable solutions. However as Hales (2000) found many planners do not see sustainable development as any different from what they have always done, or else regard it as the latest fad, soon to be replaced. Where planners lack interest and knowledge of sustainable development, then they will not be in a position to act as motivators for sustainable policy and decision-making. So if planners are to answer the call to deliver more sustainable development then they will need to fully understand the issues and problems. Training will be an essential element of this (O’Riordan, 1999, Briassoulis, 1999). Planners may then be able to apply tools more effectively and use their many other skills to bring forward more sustainable development policy and practice.

Chapter 5 The Use of Sustainability Appraisal in Strategic Spatial Planning: A Case Study of the East Midlands Regional Planning Guidance Appraisal Process.

5.1. The Evolving Regional Dimension in England

Regional strategic planning has been used as a vehicle for addressing the disparity between regions and even across regions, particularly in relation to economic performance. However the importance and influence of regional planning has ebbed and flowed throughout the 20th Century (Alden and Offord 1996). In the late 1990s there has been a re-emergence of strategic planning at regional level.

During the 1980's regional strategic planning was at low ebb. The then Government preferred a centralised approach to dealing with areas of poor economic performance. Regional assistance was decided centrally and issued to specifically designated areas (Greed 1996). Toward the end of the 1980's a change in emphasis occurred, influenced in part by increasing European Union interest in planning (Tewdwr-Jones et al, 2000). The introduction of stronger regional guidance as an element of the statutory planning system (HM Government 1989) increased the emphasis on regional issues and introduced a need for cross regional working. Throughout the early 1990s, Regional Planning Guidance (RPG) notes were issued by Government, as part of the series of planning guidance notes for local planning authorities.

Most regional functions of Government were and continue to be, delivered from the Government Offices of the Regions. These offices, set up in the early 1990s, have responsibility for a variety of functions of Government, including the preparation of regional planning guidance for the Secretary of State. They also have responsibilities to deliver regional aspects of other Government departments' policies within their regions, with the view to providing a more integrated approach.

The incoming Labour Government in 1997 had plans to devolve power to elected bodies in Scotland and Wales. Some role for the English regions was also envisaged (DETR 1997). Regional Development Agencies (RDA) and voluntary regional chambers have been set up in the English regions. Other regional groupings have also been formed, including regional round tables. The regional approach is currently identified as the level at which to co-ordinate economic policy (Webb and Collis 2000).

The regions have also been identified as key players in delivering sustainable development, and have, as requested by the Government, developed sustainability frameworks as a basis for future regional strategic planning.

5.1.1. Regional Planning Guidance

Regional planning guidance (RPG) was introduced following as part of the Governments approach to reforming the development plan process for land use planning (HM Government 1989). Guidance on the role and purpose of RPG was originally covered in PPG 15 (DoE, 1990b) and later replaced by PPG12 (DoE, 1992), following the introduction of the Planning and Compensation Act 1991. Local authorities were encouraged to join together in some form of standing conference to prepare advice on which the Secretary of State could provide his guidance. The purpose of RPG was to provide a strategic framework to assist county authorities in the preparation of their structure plan (see Chapter 2). The time-scale covered by regional

plans was to be around 20 years and the policies included should deal with issues that were not covered at national level, but were important across more than one authority area. In addition guidance was clear that RPG should deal only with land use planning issues and not with a wider regional remit, such as economic development (Alden and Offord, 1996).

The early development of RPG was based on advice offered to the secretary of State by these regional planning conferences. Planning conferences, consisting of elected members and officers, with officers responsible for the preparation of a regional document, with the members responsible for acceptance and ratification of the document. This was forwarded to the regional Government Office. RPG was then developed and published by the Secretary of State.

The Government's initiative on "Modernising Planning" led to a change in the process for developing RPG. Preparation of RPG was to follow the guidance included in PPG11 (DETR 2000d), which is similar to the process for the development of structure plans (see chapter 2).

Regional planning fora had responsibility for the development of RPG, which is open to consultation and subject to an examination in public, before being published by the Secretary of State. In future Regional Chambers (or Assemblies) are to be given responsibility for Regional Spatial Strategies (RSS) (ODPM, 2002c), which will replace RPG and have a stronger statutory position in the planning process.

5.1.2. Regional Development Agencies

RDAs are statutory Non Departmental Public Bodies and are accountable to Ministers. However RDAs are charged with taking full account of regional interests. RDAs are to be business led, although board members may have expertise in local government and other sectors. RDAs are responsible for the funding and direction of development within their region. They will co-ordinate all development funding, in particular RDAs have responsibility for rural regeneration, from the Rural Development Commission, regional regeneration functions, from English

Partnerships and the administration of the Single Regeneration Budget (formerly SRB Challenge Fund) from the Government Offices for the Regions. They will also be responsible for co-ordinating inward investment in their own regions. Eight Regional Development Agencies were established on 14th December 1998. The ninth has now been established for London.

RDAs have the following statutory duties:

- Economic Development and regeneration
- Business support, investment and competitiveness
- Skills, training and employment
- Sustainable Development

The first task of the new development agencies was to develop a Regional Economic Strategy. The RES is intended to provide the framework for economic decision-making. The framework should help to encourage greater co-operation between the various regional stakeholders, local authorities, business, and other local organisations. National government has recognised the variation throughout the English regions, and has avoided being prescriptive in its guidance to the new RDAs this means that there may be a greater level of regional diversity as the various RDAs develop their programmes. However commentators have recognised a conflict in the Government's position, allowing a regionally prescribed approach whilst maintaining the control of the RDAs (Tewdwr-Jones and Phelps 2000, Webb and Collis 2000).

Sustainable development is a less familiar role for development professionals. As yet there has been little specific guidance to RDAs on incorporating sustainable development within their economic strategy and action plans. RDAs will need to take a wider view than merely looking for benefits from environmental technologies and tourism if sustainable development is to be fully addressed (Gibbs 1998). Current research suggests that although RDAs are including

sustainable development as a driver of policy within strategy, there is little real understanding of how to take it forward positively. This contrasts with the approach to the more traditional concerns of development, such as regeneration, competitiveness and even social exclusion (Benneworth et al 2001). Indeed, the overall aim of RDAs is to improve the competitiveness of each region, with sustainability lower on the agenda (Webb and Collis 2000). The role of RDAs in improving the competitiveness of their region coupled with the question of who they compete with, is also the subject of some discussion (Tewdwr-Jones and Phelps 2000).

5.1.3. Regional Chambers

Regional Chambers are voluntary groupings of elected members from local authorities in the region together with other regional stakeholders. Stakeholders should cover a range of economic, social and environmental interests to be fully representative and to forward the regions well being. Government guidance suggests that the local authority elected members element of the chamber should be dominant, but with at least 30% of the chamber made up by non local authority stakeholders. The Chamber should be representative of the region's structure and political balance. Many regions already had some sort of regional forum, such as a planning forum to assist in the preparation of Regional Planning Guidance. Chambers have grown from this regional co-operation. However Regional Chambers have no statutory duties and a very marginal prescribed role in regional matters.

The Chambers have been given a specific role in relation to the RDAs. RDAs are charged with taking account of regional interests. Regional chambers provide the mechanism for RDAs to take account of regional views and account for their activities. Once a region has a recognised Regional Chamber then the regional RDA is expected to have regard to the Chamber in preparing its strategy, consult the Chamber on its corporate plan and give an account of its performance to the Chamber. However RDAs are primarily responsible to Government so in practice the Regional Chambers have little leverage (Benneworth et al 2001).

Regional Chambers are at liberty to engage in other regional work. The Government has published guidance (DETR 2000e) on the makeup and constitution of a chamber to ensure equitable involvement of all regional partners. The following four criteria were advanced (along with the expectation of gender and ethnic balance)

- The Local authority element should reflect the regional, local and political balance, and the type of authorities
- The non Local Authority element should be open to representatives of the main regional economic stakeholders with an interest in the work of the RDA
- The Local Authority element should be dominant but the overall size should allow a wide range of non-LA interests to be represented.
- All regional stakeholders should have the opportunity to contribute to the debates of the regional chamber for their views to be reflected in its published statements

The development of regional government has continued. The Government White Paper “Your Region – Your Choice” (ODPM, 2002c) has identified a stronger role for regional chambers. They will be expected to continue scrutiny of the Regional Development Agency, and will have a formal role as the regional planning body. Regional chambers will also be responsible for the coordination of different strands of regional policy and will have input into the funding review process. Regional chambers will have a new relationship with the regional directors of Government Offices to facilitate better joint working in the regions. In addition where the people in a region wish to see an elected regional government new legislation will allow this, following a referendum and local government review. The Government does not feel that regional government should add a third tier of governance in England, so local government will need to consist of mainly unitary authorities if elected regional government can go ahead. There will be great variation between regions in their ability or desire to move to regional elected chambers.

Chambers are perhaps suited to taking forward the role of a strategic overview of sustainable development. The Chamber has a role in endorsing the Regional Sustainable Development Framework (RSDF); these have been submitted to the Secretary of State. The Regional Sustainable Development Framework (RSDF) is seen as a high level document that will inform all policy and strategy within the region, with specific targets identified.

5.1.4. Regional Roundtables

“Building Partnerships for Prosperity” (DETR 1998d) suggested regional Roundtables for Sustainable Development as a means for addressing regional sustainability issues. Regions have moved to establish such bodies, although they are in no way mandated. In some regions the Roundtables have been a key institutional driver for sustainable development, for example Sustainability NW. The form and focus of the Round Tables varies greatly across the regions.

In many regions the Round Table has been the lead partner in establishing a sustainable development framework (RSDF). Some regions have very active Round Tables, which seek to influence the policy and programmes of both RDA and Chamber. Round Tables are in some respects well placed to champion the cause of sustainable development within their region, the role of the Round Tables to other regional bodies is not defined within statute, nor do the other bodies need to take account of the Round Table’s advice or opinions. Round Tables can have good influence where partnership working is strong and the value of “joined up thinking” is acknowledged, but where partnership working is not strong, or where a breakdown in communication occurs, then it is easy for such organisations to be sidelined from any regional strategic development process.

5.1.5. Regional Sustainable Development Frameworks

In the UK strategy for sustainable development (DETR 1999a) the Government said that it wished to see sustainable development frameworks (RSDF) in place in all regions by the end of 2000. The Government indicated that the frameworks should provide a high level vision for sustainable development, taking a wide overview of both regional activity and the impact of national Government policy at the regional level. In guidance on the preparation of frameworks (DETR 2000f) the Government indicated it wished to see document with specific objects for the region, with priorities set with the help of regional indicators and targets.

The process for preparing RSDF was not prescribed, with any regional partner able to lead on the process, but with regional Round Tables or Chambers identified as possible lead. A partnership approach of consulting all relevant regional organisations was promoted. The RSDF was not to be statutory, but endorsement by the Regional Chamber was required. The RSDF was identified as a means of addressing the gaps in regional policy as put forward in RPG or RES. The RSDF was expected to inform and guide these documents. However as RES was to be developed by October 1999 and RPG was at various stages in the different regions, the opportunity for this to occur was somewhat limited until reviews took place. The RSDF was seen as a means of driving other regional policy to be more sustainable (Benneworth 2001).

RSDF have been taken forward in the majority of regions by the Round Tables. Two regions have the Government Office as lead; one has established a special working group and only one has chosen the Regional Chamber as lead (London was not decided at the time of publication) (DETR 2000e). The RSDF has a role in establishing sustainable development at the heart of regional policy and bringing forward an integrated and holistic approach to sustainability. The linking of policy action across strategies is essential if sustainable development is to be carried forwards, as is strong partnership working within the regions. Sustainable development has been accepted as a cross cutting issue. However sustainable development may still be sidelined if no

one body is responsible for monitoring progress and calling the relevant regional bodies to account. This role would fall most clearly to a regionally elected government, if it existed.

5.2. The Use of Sustainability Appraisal in East Midland's Regional Planning Guidance

5.2.1. The Background to Recent Regional Developments in EM

The East Midlands Region consists of the counties of Derbyshire, Leicestershire, Lincolnshire, Northamptonshire and Nottinghamshire, the unitary authorities of Derby, Leicester, Nottingham and Rutland, together with, (for land-use planning purposes) the whole Peak District National Park, in all some 45 local authorities. It has a population of 4.1 million and GDP of 96% of UK average. The East Midlands does not sit naturally as a region; it does not have a strong regional identity (Benneworth et al. 2001). It is, rather, a gathering of a number of sub regional areas with strong identities. It is a diverse region. It has a mainly rural character, but includes within its boundaries four large cities and some significant industrial clusters, for example coal-field areas. The region is well connected to other English regions and to Europe. The East Midlands has embraced the concept of regional structures, reacting positively to Government initiatives on regional working.

The county and district authorities came together to formally create the East Midlands Regional Planning Forum (EMRPF) in April 1990, in response to the Government call for regionally based strategic planning guidance. The EMRPF role was to produce a Regional Strategy, which would be submitted to the Secretary of State and form the basis for the Regional Planning Guidance for the East Midlands. Officer working groups prepared "Issues Papers" for the elected members, identifying the key regional issues. These papers and the comments received were used in the preparation of a Regional Strategy (EMRPF, 1992). Although RPG was to be

strictly confined to land use planning, the Regional Strategy was intended to address other issues of relevance to development in the region. The key objectives included statements on economic growth, protection of the environment and equity of economic benefits across the region. The first Regional Planning Guidance for the East Midlands (RPG8) was published in March 1994 (DoE 1994).

The EMRPF continued to act as a regional body and soon began a review of RPG8 in readiness for an eventual replacement. In 1995/6 work began on updating the Regional Strategy. In the time since RPG8 was written the agenda on sustainability issues had moved forward considerably. The Government published their approach to sustainability in “Sustainable Development - the UK strategy” 1994 (DOE, 1994). Various planning policy guidance notes (PPGs) had been published during the early 90’s. The thrust of Government policy had slowly moved to a more sustainable platform and as reflected in the gradual change in the policy guidance.

Officer working groups were tasked with taking forward the review of the Regional Strategy. The Department of the Environment had already indicated to South East Regional Planning Forum (SERPLAN) that an environmental appraisal of the South East regional strategy should form an integral part of the development of the strategy. As recommended by PPG12, local authorities were already expected to perform environmental appraisals of their development plans (DoE 1992). In addition the EU proposal to extend environmental assessment to programmes and plans had been accepted in 1996, so new EU legislation was expected in the future.

The East Midlands Regional Planning Forum felt that a fuller sustainability appraisal would be a more comprehensive approach to informing the developing regional strategy. In answer to these issues the Strategy sub-group created a Sustainability Appraisal working group in June 1996, to establish a sustainability appraisal methodology. The aims of the group were:

- To promote sustainability within the region
- To steer and facilitate the sustainability appraisal process during the review of the Regional Strategy

The group was made up of members of the regions local authorities, together with other regional partners (EMRPF 1997).

5.2.2. Developing Appraisal Methodology

At this time there was no specific guidance on sustainability appraisal at regional level, although there was Government guidance was on environmental appraisals of local plans (DoE 1993).

Many of the members of the group had experience of environmental appraisal at Local or Structure Plan stage. Leicestershire County Council in partnership with Leicester City Council had already developed environmental appraisal of Local Plans to a fuller Sustainability Appraisal and applied it to development plans. Indeed, the region had a good expertise in this field. Good practice guidelines on sustainability appraisal of RPG (DETR 1999d) were published when the East Midlands RPG was well along in its development. Indeed, the East Midlands group had some input into the guideline's development, with the chair of the sustainability appraisal sub-group on the steering committee for the project.

Other regions had begun some form of assessment on their regional plans. SERPLAN the planning forum of the south-east was amongst the first to consider appraising their new regional strategy (SERPLAN 1996). The need to include all elements of sustainability and link them together across the traditional policy divides was seen as a key element in the development of an appraisal methodology. SERPLAN chose to use the criteria highlighted in the Rio Earth Summit for their sustainability appraisal. These were

- Development

- Environment
- Futurity
- Equity
- Participation

The methodology devised formed a matrix with these five principles at the head. All policies were then reviewed across these five overarching principles. The methodology was used to review the old regional strategy, before it was applied to the new strategy. The review across principles rather than traditional policy areas had many advantages. Policies were more fully investigated for their impact across policy areas and sustainability issues were at the heart of the review. However there were some disadvantages, particularly repeating the same ground over. (Therivel et al 1999).

The West Midlands had also looked at sustainability, but had used a resource-based approach, identifying regional resources (West Midlands Regional Forum of Local Authorities 1992). The East Midlands found aspects of both the West Midlands and SERPLAN approaches useful. The East Midlands sustainability appraisal working group decided during the early stages of developing the methodology that the first step should be to identify the important resources of the region. These resources were considered to be the important “capital” of the region that should be sustained. These resources were the elements that had impact on people’s quality of life in the East Midlands across social, economic and environmental themes. They included:

- Land
- Air
- Water

- Soil
- Natural Heritage
- Energy
- Built and Cultural Heritage
- Built Environment
- Infrastructure
- Settlements (including Cities)
- People
- Economy
- Waste Materials
- Minerals

This part of the process can be broadly identified with the task of characterising the environment as detailed contemporary good practice guidelines on appraisal (DoE 1993).

The need for an objectives led approach (see figure 5.1) was identified, prior to Government guidance. Each of the identified resources was linked to at least one objective that was designed to promote the sustainable development of that resource. These objectives then form the basis for the sustainability appraisal of the specific policy statements in the RPG. To aid the appraisal a series of assessment criteria were identified for each objective, to consider how the objective could be achieved. For example for the resource “energy” there was two objectives;

- To reduce energy use especially from fossil fuels
- To encourage the development of renewable energy supplies.

Assessment criteria linked to these objectives included maximising efficiency in use of energy for heating lighting and commercial processes and encouraging local power supplies. Objectives and assessment criteria formed the basis of the matrices that were used to appraise the different policies.

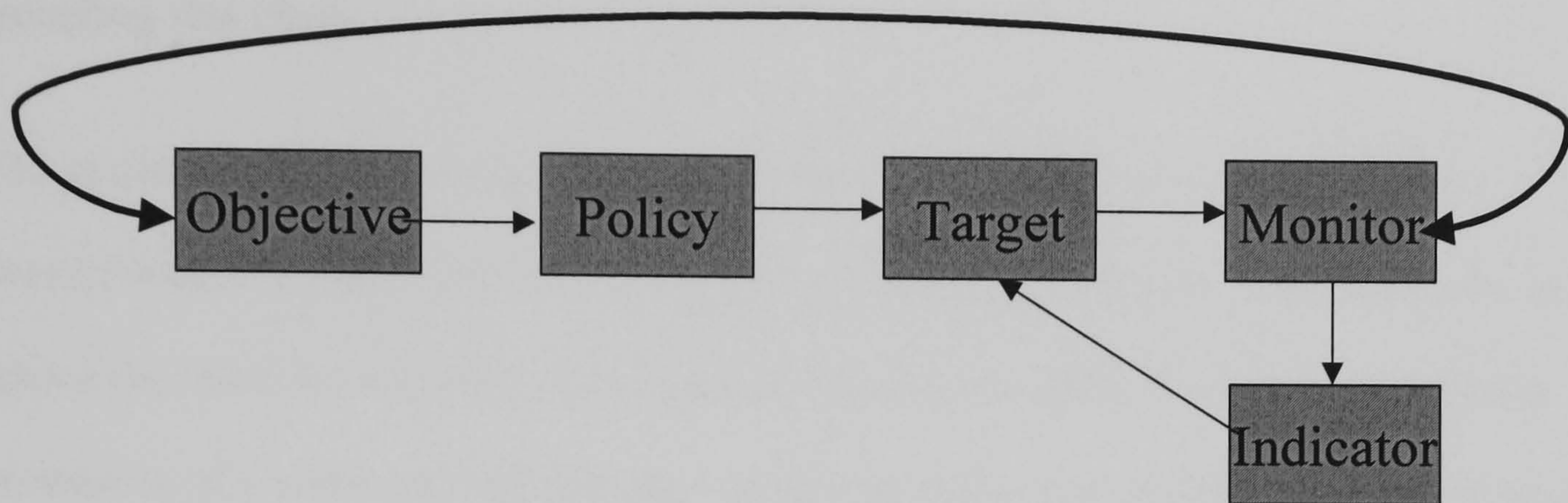


Figure 5.1. Objectives led Approach

The monitoring of progress was identified as crucial to the whole appraisal process and a series of indicators were identified as potential means of evaluating the effectiveness of the RPG policy over time. The availability of data for monitoring was quickly identified as a possible area of difficulty. A variety of indicators were already in use (DoE 1996), and some data was available from local groups, which could perhaps be used to construct new indicators. However it was apparent that the availability of data together with the collection and analysis of data would require a not insubstantial effort from regional bodies, which function mainly on good will. The gaps and unsuitableness of some national indicators was recognised, but the appraisal process needed to continue without these refinements. However the use of indicators was central to the appraisal process and work on indicators was recognised as a long-term development. The sustainability appraisal subgroup commissioned a study to investigate the potential and feasibility of regional indicators (Russell 1998). The eventual framework of indicators was

expected to inform the whole region. The need for baseline data was also recognised and would form part of the long-term objectives for the development of the appraisal framework.

5.2.3. Applying the Methodology

Scoping the Plan

The guidance from Government on development of RPG changed markedly over the development of the new RPG for East Midlands. Initially the EMRPF was tasked with preparing advice on which the Secretary of State would base the new RPG. The region felt that the production of a wider regional strategy, which informed many regional groups and from which the Secretary of State could produce RPG, was the best way forward. Thus, the task was not approached as a plan preparation. Good practice guidelines (DoE 1993) suggested plans should be scoped as part of the appraisal process. Scoping involves defining the range of issues that need to be addressed by policy and checking that all of these issues are included as policy within the plan. This involves having regard to the national and international policy framework as it affects the region. Scoping of this sort was not explicitly included within the appraisal methodology as originally developed. However the range of issues to be addressed regionally were identified in an Issues Report (EMRPF 1996). This identified national and international changes in policy since the previous RPG had been adopted. It also identified the issues felt to be of regional significance. The purpose of the Issues Report was to engender discussion about the needs of the region.

Appraising Plan Policies

The strength of appraisal is in its role of informing plan makers of the breath and depth of interaction of policy. The Sustainability Appraisal sub-group felt that it was important that each working group applied the methodology to their own policy development. They felt that the

experience of appraisal would help to encourage more awareness of sustainability issues in policy making. The appraisal was not just a tool for improving plan making, but also for raising awareness of the many impacts of policy, not just where the impacts are expected but across all policy and objective areas. The process of appraising is a powerful tool to assist the development of “joined up thinking”. Each separate working group was expected to assess the sustainability impacts of their own policies across the objectives identified in the methodology. Members of the Sustainability Appraisal Sub-group were available to provide help during the appraisal process and also provided guidance to the appraisers before undertaking the appraisal, a working paper (EMRPF 1997) was written to inform on and guide the appraisal process.

Each working group performed the appraisal of their policies across the objectives identified, with the identified assessment criteria providing guidance on assessing impacts of policy.

Potential impacts were to be evaluated as positive (moving towards sustainability), negative (moving away), uncertain and no effect. In general three members from policy groups made up the appraisal team for each of four key sections of the strategy, namely

- Natural and Cultural Resources
- Urban and Rural Systems
- Communications and Infrastructure
- Minerals and Waste

This first stage of the appraisal was performed on the initial draft document for the purpose of assessing policy options. Appraisals took between 3 hours and 1 day to perform. The sustainability appraisal sub-group was responsible for analysing the returned appraisal documents. Policy groups were expected to document the changes made to policy and were given the opportunity to comment on the appraisal process, which would assist the further development. Recommendations for improving the appraisal process included a need for more

guidance on grouping of policies and detail required for the appraisal, guidance on policies with varying impacts and on additional impacts, including cross boundary effects, were also highlighted (LCC, undated).

Seven of those involved in the appraisal process provided feedback, this feedback was generally favourable, although one respondent felt that the whole process was an exercise in public relations.

“It was merely a public relations exercise, the sustainability of the policies – whatever that means – could easily be done without the attempt at pseudo-science”

The majority found the appraisal process helpful, with quotes such as

“more helpful than I anticipated”

“Pretty helpful, if only in the sense that it made you consider the wider implications of the policies”

Many felt that the process had improved the policy content. Policy conflict and contradictions were identified, and policies could be altered to mitigate negative impacts and enhance positive impacts. Many felt that more thought had been given to policy by considering individual or groups of policy against key objectives.

“On the whole, I consider the appraisal was certainly worthwhile and led to several improvements both in policy statements and supportive text.”

Indicators were identified as useful, if they could be chosen appropriately. Feedback from the groups indicated that secondary or cumulative effects of policies had not been addressed within the appraisal. The feedback comments indicated that most of the groups felt that these were too complicated to assess. This is a key element in SEA or Sustainability Appraisal and this

difficulty shows that use of SEA or appraisal may require some additional training or information, if the more difficult aspects are to be fully considered.

Independent Appraisal

During the development of regional strategy the regional picture changed rapidly and significantly. Following the passing of the Regional Development Agencies Act 1998 the East Midlands Development Agency (EMDA) was formed closely followed by a working regional chamber. The East Midlands Regional Assembly was among the first to be designated in May 1999. The Assembly assumed responsibility for progressing the regional strategy. The Assembly were of the opinion that integrated regional working between the new, and established, regional groupings was essential. They moved to develop the regional strategy as an Integrated Regional Strategy (IRS), in an attempt to bring together all regional policy to achieve common objectives. The IRS would be the region's sustainable development framework. The EMDA Strategy was seen as the economic strand of the IRS and RPG as the spatial strand.

The Government were, by this time, expressing the view that RPG should be regionally produced and follow a process similar to development plans as eventually enshrined in PPG11 (DETR 2000d). Responsibility for production of a draft RPG was transferred to the East Midlands Local Government Association with the EMRPF under its umbrella. The recommendations of the consultants on sustainability appraisal of regional planning guidance were published for consultation in July 1999 (DETR, 1999d) and eventually adopted (DETR 2000g). This had major impacts on the preparation of RPG and the main recommendations included the need for an objective based methodology and independent appraisal.

RPG was due to be published as a consultation draft, so although the official guidelines had not yet been adopted it was considered appropriate to follow the recommendations of the consultants. The East Midlands sustainability appraisal sub group had always felt that a key

benefit of appraisal was improving the awareness of policy makers as they performed their own appraisal, rather than feeding in information from consultants, divorced from the policy process. The recommendations and eventually the guidelines strongly upheld the need for an independent appraisal process. In view of this an independent appraisal was commissioned.

The independent appraisal built on the work already done in the region, but extended and improved the methodology in a variety of ways (EMRLGA, 1999a, 1999b).

- The provision of a clear audit trail was a significant input.
- New matrix forms were designed which specifically included commentary sections and audits of changes of policy.
- A review of the objectives in the RPG against national sustainability objectives was included.
- A specific policy compatibility test was included.
- Although the place of indicators was integral to the appraisal there had been little setting of targets to act as benchmarks

The review of objectives raised some difficulties, since although the appraisal had been objectives led the RPG was not. This was in large part due to the change of purpose of the document, from general advice for the Secretary of State to use to develop RPG, to actual draft RPG. It was also in part due to the concurrent development of the strategy and the appraisal methodology. In addition those versed in sustainability appraisal were more aware of the need for clearly defined goals in strategy for the appraisal to be effective. The IRS was developing a common set of objectives, but the spatial objectives were devised after the bulk of the RPG policy and were somewhat artificial since policy had not been developed from them.

Improvements following the appraisal included a stronger section on scoping the regional policies against national policy and adoption of specific targets linked to policy. An area of

weakness that was particularly identified was the lack of consideration of alternative policy options.

The consultants recognised that the East Midlands was well advanced in use of sustainability appraisal in the English regions (EMRLGA, 1999c). Many of the aspects of the East Midlands methodology were recognised as good practice. The sustainability appraisal sub group recognised that the input from the consultants had strengthened the appraisal methodology and made it more robust and transparent. In spite of initial misgivings, the benefit of independent appraisal was accepted. However the benefits of integrated appraisal throughout the process by policy makers should also add value to any strategy development. Following the experience of appraisal of draft RPG a mixed approach was felt likely to give most benefit. The process of appraising is as valuable as the appraisal itself.

The appraisal process was used at each stage of the development of RPG. The draft RPG was examined and the panel tested the RPG, checking that it covered all issues adequately and in conformance with Government guidance. The panel guided a public examination of the key issues agreed with the regional planning body and published a report. The appraisal documentation was available to the panel at the examination in public. Once any modifications were incorporated, the final RPG was forwarded to the Secretary of State who approved and issued the document. Revised RPG8 was finally adopted in 2002 (ODPM, 2002d).

5.2.4. The Value of the Appraisals Process in the East Midlands.

Appraisal techniques were identified as a powerful tool for bringing sustainability to strategic level planning. Appraisal can not only investigate the sustainability of the individual policies, but can by emphasising the need for an objectives led approach, with monitoring built in, lead to a more structured plan with sustainability at the very heart of all objectives.

The main advantages of sustainability appraisal are:

- Ease of use – appraisal techniques are intended to be easy to apply, without need for difficult mathematical or economic assessment
- Increased knowledge – applying appraisal techniques is a learning experience, which helps policy makers understand the implications of sustainable development and the cross policy inter linkages.
- Improved plan – the iterative nature of appraisal helps to inform plan makers and hence leads to a better plan

The main disadvantages are

- Qualitative – the lack of quantitative measurement can lead to important issues not being fully assessed.
- Easily sidelined – if there is no commitment to the appraisal process it can be sidelined and the results merely paid lip service.
- Time-scales – the different time-scales of some impacts may be difficult to fully include

The lack of quantitative data is partially overcome by using indicators to monitor progress of policy towards targets. Much work has gone into developing indicators relevant at different levels and to different groups. There are however still issues surrounding the use of indicators.

At regional level it is not always possible to access data, this has particularly been a factor in the difficulty of assessing regional greenhouse gas emissions. In addition at regional level much work is done as partnership with little or no resources. The collection of data implies certain levels of quality assurance if the data is to be useful. At regional level there are no mechanisms in place to perform this task, although the Regional Observatories may be able to fulfill this role in the future.

There is also a danger of whole issues becoming downgraded if no indicator exists or can be developed. The use of targets to benchmark the progress of policies can provide a useful driver.

However if not all areas have targets then perhaps more effort will go into achieving the specified targets. Ill chosen targets may also work against sustainability in some specific circumstances. There is a need to continue to fully evaluate and check the validity of the indicators and targets chosen.

The process of appraisal can still be valuable in spite of these potential difficulties. The introduction of sustainability as a concept means that social, economic and environmental issues are related and cannot be dealt with in isolation of each other. There is a need for the impacts of policy in each of these areas to be identified and qualified. This is a comparatively new approach. Previously little allowance was made for any inter-linkages and cross policy affects (Barling et al, 2002). Economic policy was decided on economic ground, similarly social policy and environmental policy. Cross policy affects were not always considered, and certainly not in a methodical manner. The regional level offered new opportunities for an integrated approach, since there were no established organisational or political groupings to segment policy delivery (Valler and Betteley, 2001)

Each decision-maker's own experience and knowledge guides the production of any new or revised strategic plan. Environmental experts may have little experience of the possible impacts or benefits of their policies on the economy or for communities and society. Sustainability Appraisal offers a tool to decision-makers, which helps to identify key issues. It allows them to consider impacts of policies across policy areas and to consider whether some changes to each individual policy could help guide the improved sustainability of the whole plan.

Sustainability Appraisal is a process. It does not deliver sustainability or even sustainable development. It merely provides a means of considering complex cross policy interactions.

However it's power as a tool can be even greater as in the process of considering these cross policy interactions, each individual is made more aware of policy impacts and benefits. Without awareness of these issues amongst key decision-makers it is impossible to improve

sustainability. This awareness raising aspect of sustainability appraisal is potentially a great strength of this tool.

The East Midlands Assembly has seen the value of appraisal and is emphasising the use of sustainability appraisal as a key element of regional strategy making. All strategies produced as part of the IRS are expected to undergo sustainability appraisal. The economic strategy was appraised immediately after the RPG by the same consultants. A step-by-step guide to appraisal (EMRA 2000a) has been produced based on the RPG methodology and has been used to appraise the environment strategy. The appraisal has helped deliver an integrated approach and the value of this integrated approach has been acknowledged nationally (ODPM, 2002c, p26, Box 2.4).

“The framework you have developed to take forward the IRS seems to present the opportunity for all regional players to work together towards a common vision” Hillary Armstrong, Minister for the Regions, address to EMRA 14/05/00

The Assembly have also helped EMDA to develop a checklist (EMRA 2000b) based on the IRS objectives to allow the individual actions that are contained within the action plan to be appraised more quickly. Sustainable development has been placed at the heart of the policy process and although it is not fully delivered, it is most certainly not sidelined.

Chapter 6 Attitudes and Awareness of Land Use Planners to Sustainable Development and Sustainable Energy

6.1. The need for research

Land use planning has significant role to play in delivering sustainable development through an integrated approach to local policy as discussed in chapter 2. There are a variety of tools available to planners to help with policy integration and support. These tools, discussed in chapter 4, are not able to deliver sustainable approaches alone, the role of the planner is pivotal. The attitudes and awareness of the local planner may therefore have relevance to policy formulation and the decision making process.

Land use planning has been identified as an appropriate arena to integrate national policy at local level (Vigar and Healey, 1999). However if this is to occur planners must be able to consider policy actions across all policy areas, not just those associated with land use planning. Research suggests that only a small subset of issues are considered during the planning process (Willis, 1995). At the time of the survey reported in this chapter there was little research to indicate how sustainable development was being integrated into the planning process. However research published later has suggested that planners are not yet fully integrating sustainable development into the planning process (Hales, 2000, Counsell, 1999). This research sought to assess what importance land use planners give to sustainable development when separated into different themes. The research hypothesis is that:

“Planners give more weight to some aspects of sustainable development within the planning process”

Investigating further the integration of a particular policy area, namely energy, within the framework of land use planning (Chapter 3), we find that there are limited opportunities for action. The opportunities that exist are for energy savings through layout and design and implementation of renewable energy technologies (Chapter 3). However, energy efficiency is considered a matter mainly for Building Regulations and planning has been identified as a barrier for renewables (Chapter 3). Local authority energy policy has been identified as a way to ensure energy is considered within planning (RTPI, 1996), so as part of this research I wish to identify whether local authorities have policies for energy efficient design, and whether energy efficient measures are included within any local energy policies. As a research hypothesis I postulate that:

“Planners are not aware of local authority energy policies”

Whilst there have been various studies of local community’s views on renewable energy (and particularly wind power) and developers actions (Devine-Wright et al, 2001), so far there have been no comprehensive studies of planners views of renewable energy installations. Planners’ attitudes to renewable energy may augment the creation of a barrier to renewables in the planning process. Some renewable energy installations have been at the centre of contentious proposals, which has led to confrontation with local communities. Planners may feel that all renewable energy is contentious in their local community, which may make them less willing to support renewable energy. This research was designed to investigate these questions with two further research hypotheses to address:

“Planners perceive renewable energy in a negative light”

“Planners believe all renewable technologies are equally acceptable or unacceptable to their local community”

Planners have different roles in the planning process, some are engaged in preparation of plans, and others are engaged in development control. These two functions are quite different and call for different skills as discussed in chapter 4. It is therefore possible that these different planners may have very different values, and approach sustainable development and sustainable energy very differently. I postulate that:

“Strategic planners and development control officers will have different attitudes to sustainable development and sustainable energy”

National and local planning policy recognises the difference in urban and rural areas. The pressures and benefits of development are often different between urban and rural areas. In addition, specifically to this research, renewable energy technologies often need to be sited in rural areas to access the renewable resource, wind and hydro are good examples of this. Thus a possibility of differing attitudes to renewable energy was identified and as a research question I postulate that:

“Urban planners will have different attitudes to renewable energy compared to rural planners”

In order to investigate local planning officers’ attitudes to and awareness of sustainable development and sustainable energy, a survey was undertaken. The survey was designed to investigate the attitudes and awareness of local authority planning officers to different aspects of sustainable development, awareness of energy policy and attitudes to renewable energy.

The aims of the research were:

- To identify if some issues were of more importance to planning officers in respect of sustainable development.
- To investigate the planners awareness of local authority energy policies
- To investigate planners attitudes to the development of renewable energy technologies
- To investigate variations between planners with different roles
- To investigate differences in attitude to renewable energy between urban and rural planners.

6.2. Methodology

6.2.1. Research Design

To evaluate the attitudes and awareness of planners in England and Wales, it was necessary to canvass the views of a large number of planning officers in local planning authorities (LPA) in England and Wales. A postal survey was identified as the most appropriate way to reach this wide audience, since a large number of responses to the survey were required and selections from all different types of LPA would ensure a good spread of responses from the identified sub-groups. A postal survey was also the most efficient way to collect the responses in a relatively short time. The precise target sample was reached through two routes; surveys sent to all chief planning officers and surveys sent to all members of the Planning Officers Society.

The questionnaire was developed with help from a focus group of local authority planners involved in sustainable development at the regional level in the East Midlands. These planners were all very aware of sustainable development and energy issues. They were part of the group involved in the sustainability appraisal of the East Midlands RPG.

6.2.2. Pilot study

The questionnaire was piloted amongst planners in the East Midlands Region, including members of the focus group. The surveys were sent out in February 1998. In all 24 surveys were issued, by post, with a pre-paid return envelope. Nine surveys were returned initially. In April reminders were sent and a further three were returned, however one of these was not completed. Thus, in all eleven replies were available for analysis (n=11). The size of the pilot population was too small to reliably provide full analysis information, but at an early stage in development the feed back was considered valuable.

The pilot allowed clarification of a number of the questions and improved the overall survey design. In particular in Section 1 “your position”, a question was added to allow respondents to describe their duties, which confirmed that the sample was drawn from the appropriate population and allowed for sub-groups to be identified. Question 13 was originally designed using a Likert scale, but the results from the pilot showed that this led to a lack of discrimination in the responses, with all items being rated important or very important. This question was altered to require a choice of three items that were considered most important by the respondent.

6.2.3. Final Survey

The final survey, included as Appendix C, was separated into 5 sections.

- Section 1 – Your position
- Section 2 - Sustainable development and your job
- Section 3 – Local Agenda 21
- Section 4 – Sustainable Development
- Section 5 – Energy Efficiency and Renewable Energy

Section 1 provided information about the respondent, their post and responsibilities. Section 2 asked respondents to identify areas where they felt they would benefit from information or training. Further sections were designed to obtain information on attitudes and awareness to LA21, Sustainable development and energy matters.

Question design

In order to obtain the most flexible set of information a variety of question types were chosen. . Some questions were designed to allow open comment to obtain insight based on the respondent's experience. Other questions were designed to obtain specific responses, with respondents able to select answers such as Yes or No. Those questions that sought information on planners' attitudes were generally formatted using a Likert scale.

The importance of the various themes of sustainable development was identified through question 13, which was formulated as "*choose the three issues that you personally consider most important when planning a new development*". Thirteen separate issues, which corresponded closely with the resources identified in the East Midlands sustainability appraisal, were identified as items for the planner to choose from, specifically:

- Minimising loss of open land
- Quality of the built environment
- Minimising pollution
- Improving waste management
- Reducing social exclusion
- Encouraging use of renewable energy
- Increasing the vibrancy of the local economy

- Reducing car journey length and number
- Encouraging energy efficiency
- Promoting conservation of water resources
- Improving quality of life via health and education
- Protection from crime and fear of crime
- Improving biodiversity

If all aspects of sustainable development are equally important, then it is difficult to choose the three most important, but equally, if all aspects of sustainable development are equally important then the responses should average out across all of the items. This question was designed to ensure discrimination, since the pilot survey identified a tendency to give each item a similar value when measured using a Likert scale and ranking all items from one to thirteen would have led to greater loss of data, due to missed responses. Where less or more items than the three requested were chosen the responses were scaled appropriately.

The awareness of local authority energy policy, whether within the development plan, or as a separate strategy was investigated through questions 17 to 21. Questions 17 to 20 required categorical answers, yes, no or don't know. The questions were:

17. Does your authority have an official energy policy?

18. Does your authority request an energy efficiency rating greater than specified in Building Regulations Part L?

19. Has that level increased in the last 12 months?

20. Do you include any other specific energy efficiency requirements?

Planners' view of their authority's performance on energy was canvassed through question 21 was "*How do you feel that your authority is performing in energy efficiency measures*". The respondent was then expected to choose a response from a scale covering; very good, good, average, poorly or very poorly.

Planners' attitudes to renewable energy and their perception of community views of renewable energy were tested through questions 23 and 24. Question 23 was a series of attitudinal questions that planners could rank on a Likert scale from 1 to 5, where 1 was agree strongly and 5 was disagree strongly. The statements were worded both positively and negatively, such that someone with strong beliefs would not be completing the same response for each item. There were eight items for ranking covering local, national and technical issues on renewables, specifically:

- *Renewable energy is too expensive to generate at present*
- *There are many opportunities for renewables in my area*
- *Renewable technologies are unreliable*
- *Most people in my area would welcome more renewables.*
- *More of our energy should come from renewable sources*
- *Government Action will be needed to increase the uptake of renewables*
- *Local people are not familiar with renewable energy*
- *Local authorities need to take the lead in encouraging renewables*

Question 24 was designed to ascertain the planners opinion of the acceptability of different renewable energy technologies in their local community and asked "*in your opinion how would the following types of renewable energy be received in your area*". Respondents were expected to rank the each of ten renewable energy technologies on a Likert scale from 1 to 5 where 1 was

very favourably and 5 were very unfavourably. Respondents were also able to select not applicable for technologies that were not possible in their area (e.g. hydro in low lying areas or wind in urban areas). The ten technologies that were put forward were:

- *Large scale wind (i.e. wind farm)*
- *Small scale wind (i.e. 1 or 2 turbines)*
- *Biomass*
- *Passive Solar design*
- *Waste Incineration*
- *Solar electricity*
- *Small scale hydro-power*
- *Solar heating*
- *Landfill gas*
- *Combined heat and power*

Combined heat and power is not necessarily a renewable technology, but is an energy efficient form of generation and is considered along side renewable energy in the Governments New and Renewable Energy programme, so was included here.

The data from the survey was represented numerically and input into a spreadsheet. The results were analysed using SPSS (Statistical Package for Social Sciences version 10).

Selection of Respondents

During June of 1999 a survey was sent by post to all chief planning officers in England and Wales. The survey was also sent, again by post, to members of the Planning Officers Society in

England and Wales. The survey was designed to canvass local authority officers involved in strategic planning and development control, with the intention of assessing their awareness and attitudes of sustainable development issues. A total of 950 surveys were issued, with a reminder mailed to members of the Planning Officers Society only, in July 1999. In all 361 Surveys were returned, of which 348 were used in the analysis. The unused returns took the form of uncompleted forms mainly due to duplicated issue. The usable results gave a return rate of 36.6%, which is a reasonable response rate from a postal survey and provides a representative sample of the population of planners in England and Wales.

Section 1 of the survey identified the professional background of the respondents. This information was used to separate out the sub groups identified for further analysis, i.e. strategic planners and development control officers and urban and rural planners. The majority of the respondents identified their main duties as either strategic planning (i.e. development plan) or development control, with a small number of replies from officers involved in other aspects of local authority work such as LA21, environment co-ordinators and building control. However many of these officers also had a role in the strategic planning function of their authority, thus the survey was well targeted at the appropriate group.

Identification of Sub-groups from the returned data

Rural and urban sub populations were identified directly from the returns for question 3. Respondents were asked to identify their authority area as mainly urban or mainly rural. 45 respondents (approximately 12.9%) did not reply; some commenting that the two were evenly balanced, or that a small urban area was important even if the area was mostly rural. None of the cases with spoilt returns for this question were included in the sub-population analysis. The remainder classified themselves as mainly rural 49.7% (n=173) and mainly urban 37.4% (n=130). These two groups were then identified in further analysis.

In most local authorities there are two distinct roles for planners, strategic planners, concerned with the development of planning policy in the development plan and development control officers, dealing with individual planning applications. In many local authorities different people, often in different departments, carry out these roles. It is possible that very different attitudes and knowledge exist amongst these two groups of planners, which may be relevant to these research questions. Thus sub-groups of strategic planners and development control officers were identified from the description of duties in question 2. Respondents who listed other non-planning roles, such as waste management, environment, LA21 were not included. Chief planning officers and those who fulfilled both roles were also excluded from the analysis. This led to around 80 missing cases around 24% of the total sample. The two groups consisted of samples of 197 strategic planners and 68 development control officers. The number of development controllers was much lower than the number of strategic planners but a sub-group with 68 samples was considered large enough for the statistical analysis.

6.3. Results

6.3.1. Sustainable Development

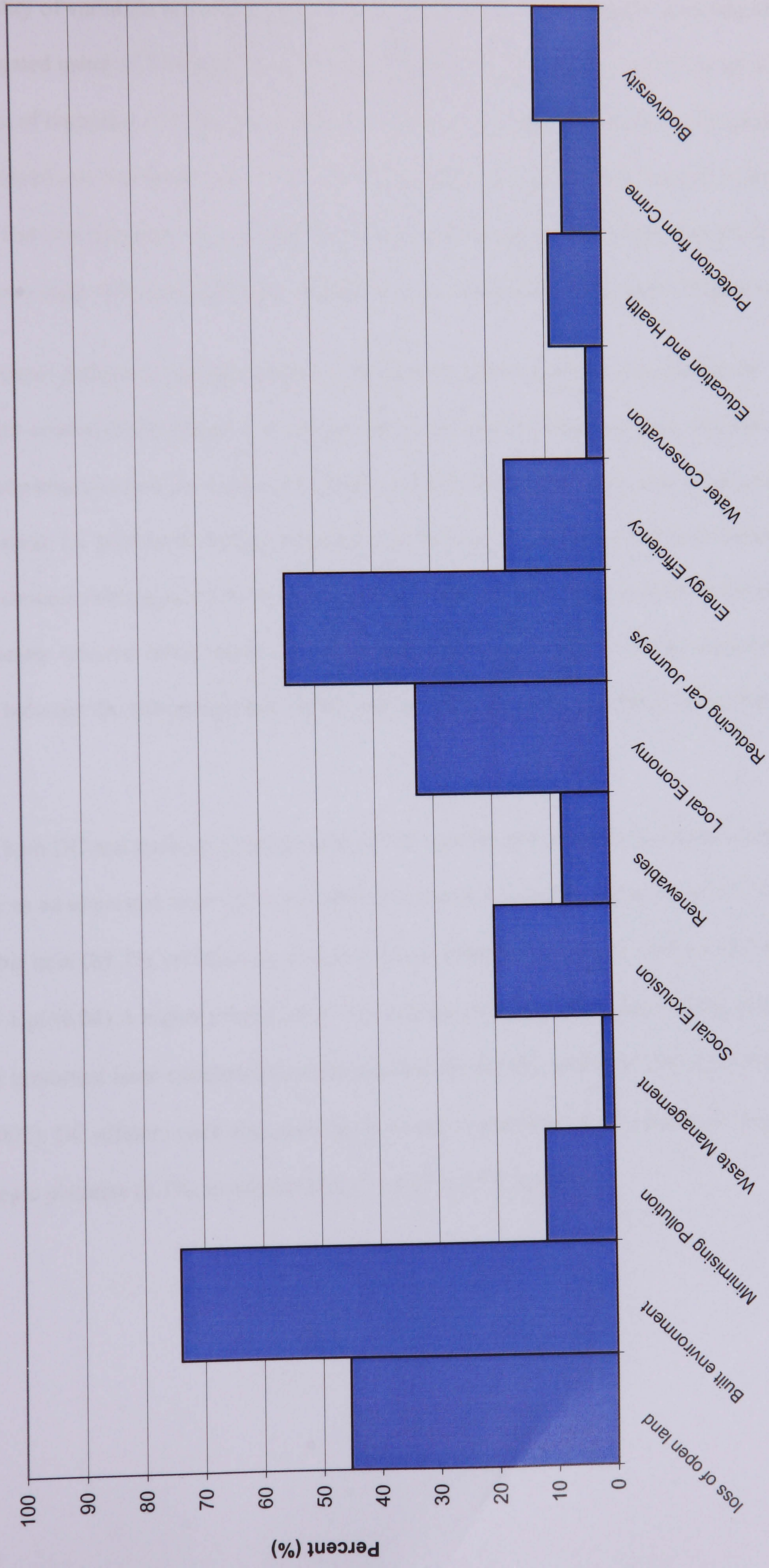
The results showed a very high level of consensus on the most important issues. Two issues were chosen by over half of all respondents, improving the quality of the built environment (74%, n=251) and reducing journeys (55%, n=187). Loss of open land (45.3% n=154) is close behind with just under half of respondents choosing this item. Around a third of planners chose vibrancy of the economy (32.8% n=112).

All other items were selected by less than 20% of all respondents with some items selected by less than 5%, namely waste management (1.8% n=6) and improving water conservation (2.9% n=10). The results are summarised in Table 6.1 and illustrated in Figure 6.1.

Issue	Full	Strategic	DC
Minimising loss of open land	45.3% (n=154)	42.6% (n=84)	64.7% (n=44)
Quality of built environment	74.0% (n=251)	73.1% (n=144)	85.3% (n=58)
Minimising pollution	11.8% (n=40)	9.1% (n=18)	14.7% (n=10)
Improving waste management	1.8% (n=6)	1.0% (n=2)	1.4% (n=1)
Reducing social exclusion	19.9% (n=68)	19.3% (n=38)	7.2% (n=5)
Encouraging renewables	8.2% (n=28)	6.1% (n=12)	7.2% (n=5)
Vibrancy of local economy	32.8% (n=112)	33.0% (n=65)	31.9% (n=22)
Reducing journeys	55.0% (n=187)	67.5% (n=133)	46.4% (n=32)
Encouraging energy efficiency	17.1% (n=58)	17.3% (n=34)	7.4% (n=5)
Promoting water conservation	2.9% (n=10)	2.5% (n=5)	2.9% (n=2)
Improving health and education	9.1% (n=31)	8.1% (n=16)	5.8% (n=4)
Protection from crime	6.7% (n=23)	5.1% (n=10)	14.5% (n=10)
Improving biodiversity	11.4% (n=39)	10.7% (n=21)	8.7% (n=6)

Table 6.1: Frequency of Selection of Items Relating to Sustainable Development

Figure 6.1. Frequency of Selection of Items Relating to Sustainable Development



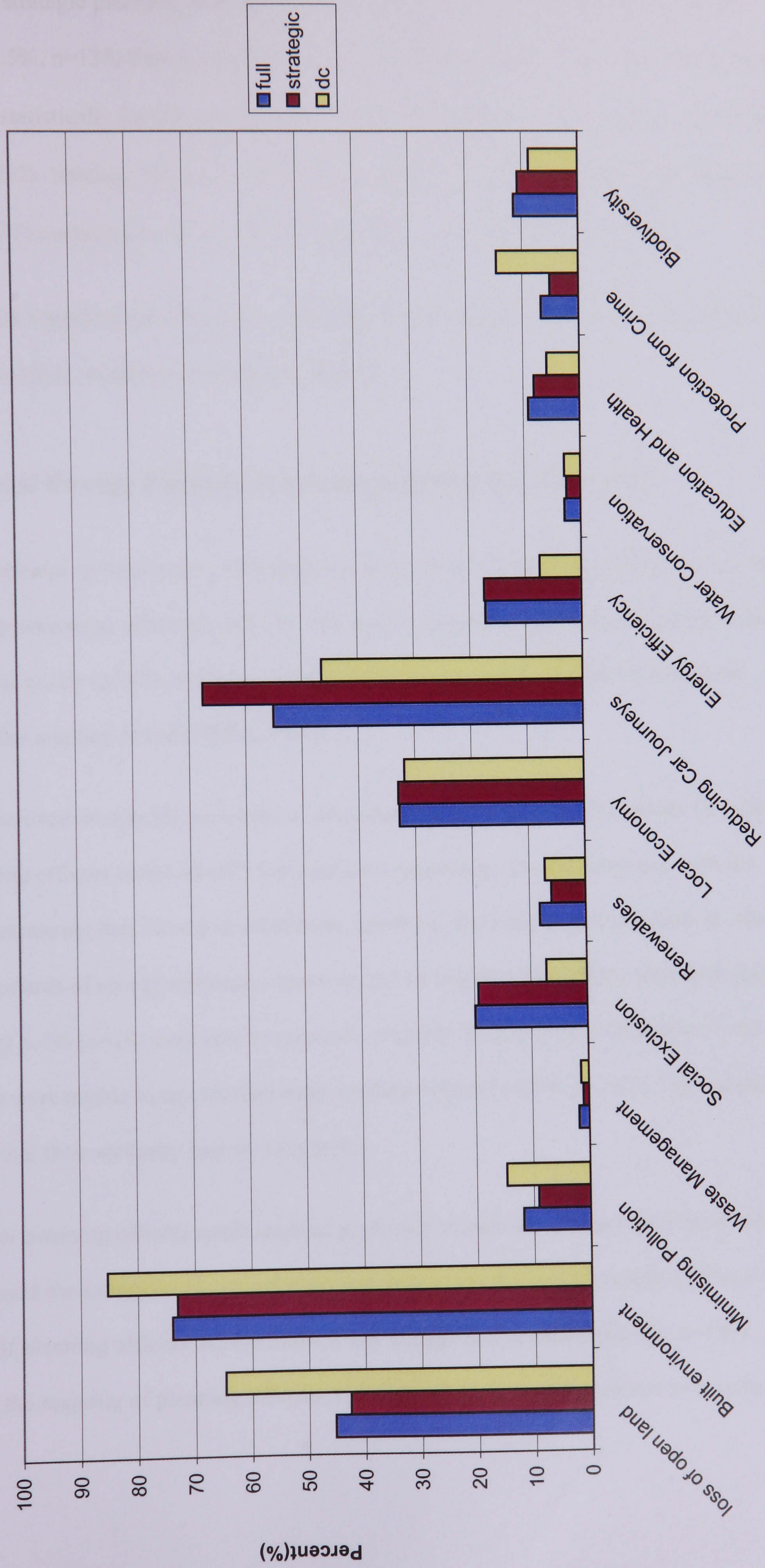
The possibility of variation between development control officers and strategic planning officers was investigated using a Chi Squared test. The test assumed that the groups would return similar distributions of responses, i.e. the null hypothesis assumed no difference between sub groups.

The Chi squared test was chosen as the answers to this question were categorical and so a non-parametric test was required. The agreement across identified sub-groups of this sample is generally very high, with few variations identified. These results are illustrated in Figure 6.2.

The sub-groups, defined as strategic planners, involved in plan and policy preparation, or development control (DC) officers, concerned with each individual development, showed a high degree of consensus across the items. Indeed both groups selected the same four items as the most important, i.e. built environment, reducing car journeys, loss of open land and vibrancy of the local economy (although not in the same order). There was similar agreement on the two least frequently selected items, waste management and water conservation. There were however variations between the sub-groups that were found to be statistically significant above the 95% level.

Although both DC and strategic planners selected the quality of the build environment most frequently as an important issue for sustainable development, a larger proportion of DC officers selected this item (85.3%, n=58) compared to strategic planners (73.1%, n=144) ($n=265, \chi^2 = 4.150, df=1, p<0.04$). A higher proportion of DC officers (64.7%, n=44) selected loss of open land as an important issue compared to strategic planners (42.6%, n=84) ($n=265, \chi^2 = 9.857, df = 1, p<0.002$). DC officers were also more likely to select protection from crime (14.5%, n=10), than strategic planners (5.1%, n=10) ($n=265, \chi^2 = 6.517, df=1, p<0.011$).

Figure 6.2. Frequency of Selection of Items Relating to Sustainable Development By Sub-group



Conversely strategic planners were more likely to select reducing car journey length and number (67.5%, n=133) than development control officers (46.4%, n=32). The Chi squared test indicated a statistically significant difference at the 99% confidence level (n=265, $\chi^2 = 9.692$, df=1, p<0.002). Strategic planners were also more likely to select reducing social exclusion (19.3%, n=38) compared to DC (7.2%, n=5) (n=265, $\chi^2 = 5.469$, df=1, p<0.019).

These results suggested that DC officers are even more focussed on the core or traditional values of planning, compared to strategic planners.

6.3.2. Local Energy Policies and Energy Efficiency Measures

When questioned on local policy on energy close to half of all planning officers were aware of local policy on energy efficiency (49.5%, 165 cases). Around a quarter stated that their authority had no local policy (27.6%, n=92). A similar number were unable to state whether their authority had a policy or not (22.8%, n=76).

When questioned on specific measures to encourage energy efficiency (questions 18 to 20) very few planning officers could identify local policies requesting specific measures, with the majority answering don't know to all of these questions. In response to a question on whether higher standards of energy efficiency than required by building regulations were included in policy only 5.4% (n=18) were able to respond positively. Nearly half of all planners who responded were unable to say whether such a policy existed (48.5%, n=162). The remainder indicated that their authority had no such policy.

Even fewer planning officers could respond positively to indicate whether their local authority had increased the energy level requested for new build over the last 12 months (2.8%, n=8). The majority of planning officers did not know if any change had occurred (62.4%, n=181).

Similarly the majority of planning officers replied don't know to the question on whether their

authority requested other energy efficiency measures (49.7%, n=152). Only a small proportion of planning officers (9.2%, n=28) indicated that their authority did request additional measures.

All of these items showed a higher level of missing data when compared to the other items in the survey. The highest level of missing data 16.7% (n=58) occurred for question 19, “Has that level increased in the past 12 months”. Although the proportion of missing data is higher for this section, the number of responses is still high enough not to compromise the results. The results are summarised in Table 6.2.

Question	Yes	No	Don't Know	Missing
Does your authority have an energy policy?	49.5% (165)	27.6% (92)	22.8% (76)	4.3% (15)
Does your authority request a standard higher than building Regulations?	5.4% (18)	46.1% (154)	48.5% (162)	4.0% (14)
Has that level increased in the last 12 months?	2.3% (8)	29.0% (101)	52.0% (181)	16.7% (58)
Do you include any other energy efficiency measures?	8.0% (28)	36.2% (126)	43.7% (152)	12.1% (42)

Table 6.2: Summary responses on Local Authority Energy Policy (for all respondents)

When asked to rate the performance of their authority on energy efficiency, most planning officers rated their authority as performing averagely (64.1%, n=202). Further analysis separating those who stated that their authority had an energy policy from those who stated it did not, showed that authorities with an energy policy were rated more highly by their officers than those without, 22% (n=35) of officers from an authority with an energy policy rated their authority as doing well compared to 0.8% (n=7) of officers from authorities without an energy

policy. Similarly officers from authorities without an energy policy were more likely to rate their authority as performing poorly (29.8%, n=26) compared to officers from authorities with an energy policy (12.6%, n=20). These differences were found to be statistically significant (n=310, $\chi^2=25.768$, df=8, p<0.001).

When analysing differences between development control officers and strategic planners the result indicate that far fewer development control officers were aware of any energy policy within their authority, with only 33.8% (n=23) of DC officers responding, “yes”, compare to 49.2% (n=93) for strategic planners. In addition a much higher proportion (41.2%) of DC officers replied, “don’t know” to the same question, against 20.1% of strategic planners (n=257, $\chi^2=11.821$, df=2, p<0.03).

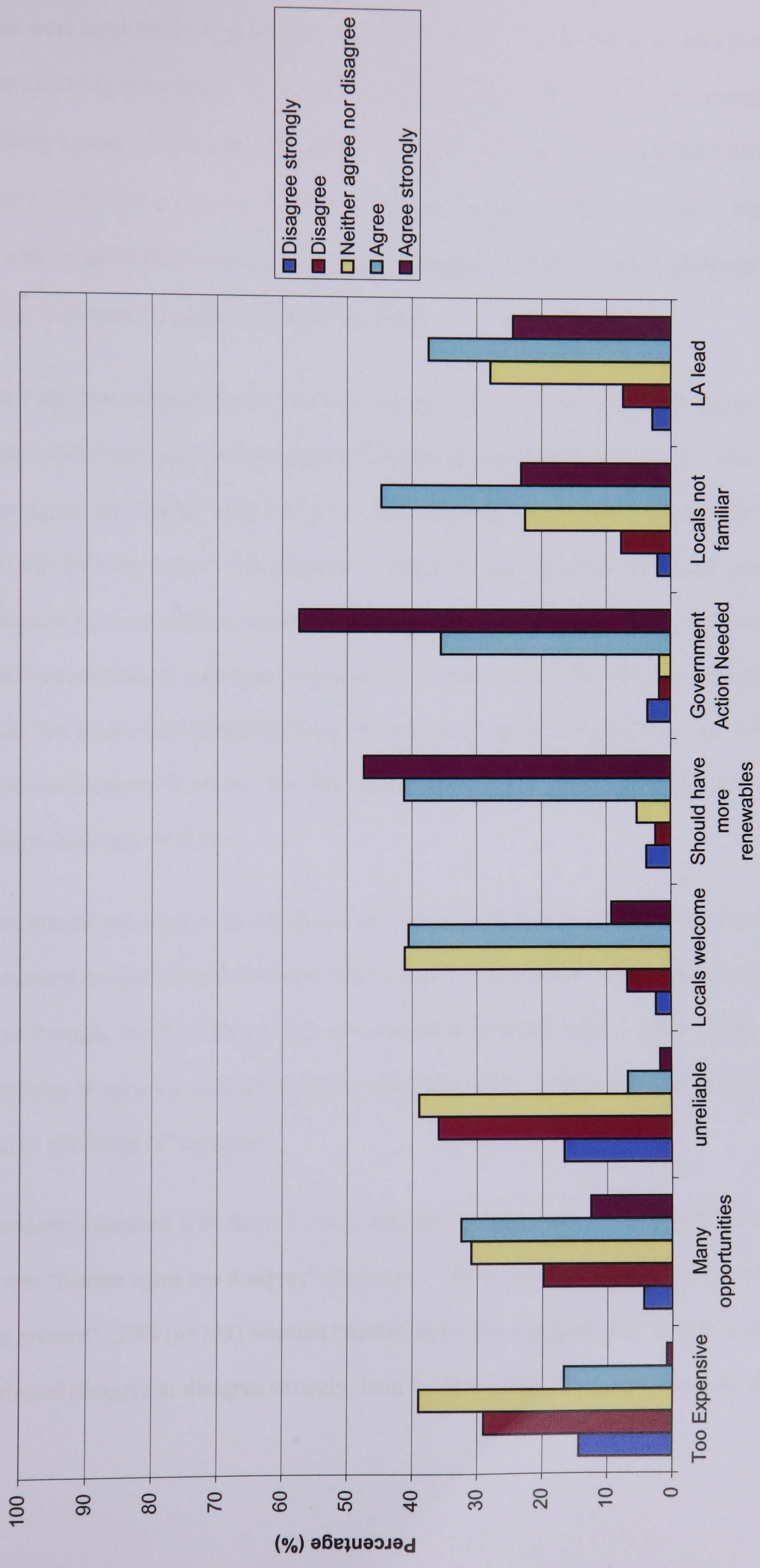
6.3.3. Planners attitudes to renewable energy

The attitudes that planners hold about renewable energy were investigated by asking each planner to rank how far he or she agreed with a series of statements relating to renewable energy (question 23). The response to this series of statements was high, with a lowest response rate of 337 out of a total of 348. Thus the analysis has not been compromised by missing data. The results are summarised below in Table 6.3 and illustrated graphically in Figure 6. 3.

Item Number	Statement	Mean	Standard Deviation
6	Government action will be needed to increase the uptake of renewables	4.41	0.9
5	More of our energy should come from renewable sources	4.26	0.95
7	Local people are not familiar with renewable energy	3.79	0.95
8	Local authorities need to take the lead in encouraging renewables	3.73	1.01
4	Most people in my area would welcome more renewable energy	3.47	0.84
2	There are many opportunities for renewables in my area	3.29	1.06
1	Renewable energy is too expensive to generate at present	2.61	0.96
3	Renewable energy technologies are unreliable	2.41	0.91

Table 6.3 Summary of responses on attitudes to renewable energy

Figure 6.3 Planners Attitudes to Renewable Energy



Respondents were most likely to agree with Item 6; *“Government action will be needed to increase the uptake of renewables”*. In all 92.9% (n=314) chose “agree” or “agree strongly” for this item giving a mean of 4.41 and a low dispersion of results shown by the standard deviation, $\sigma = 0.9$. Item 5, *“More of our energy should come from renewable sources”* was also generally concurred with. In all 88.6% (n=201) of planners chose agree or agree strongly, illustrated by a mean of 4.26, with a low dispersion of results, $\sigma = 0.95$.

Items 4 and 7 are statements about the local community’s view of renewables. The response to item 4 “locals would welcome more renewables” is almost equally split between “neither disagree nor agree” and “agree” with 41.1% (n=139) choosing “neither agree nor disagree” and 40.5% (n=137) choosing “agree”. This leads to a mean between 3 and 4 at 3.47 and a spread of results illustrated by the standard deviation $\sigma = 0.84$. Item 7, “Local people are not familiar with renewables” had a spread of responses. The majority of planners, 44.7% (n=151) chose “agree” for this item. The most of the remainder were split between “agree strongly”, 23.1% (n=78) and neither agree nor disagree 22.5% (n=76). This spread of responses led to a mean score of 3.79 and a standard deviation $\sigma = 0.95$.

Whilst there was strong support for the idea of more renewable energy as shown in item 5, item 8 *“Local Authorities need to take the lead in encouraging renewables”* was less likely to be supported as strongly. In all 37.4% (n=127) of respondents selected “agree”, with 61.8% (n=200) agreeing or agreeing strongly with this statement. Most of the remainder fell into the “neither agree nor disagree” category.

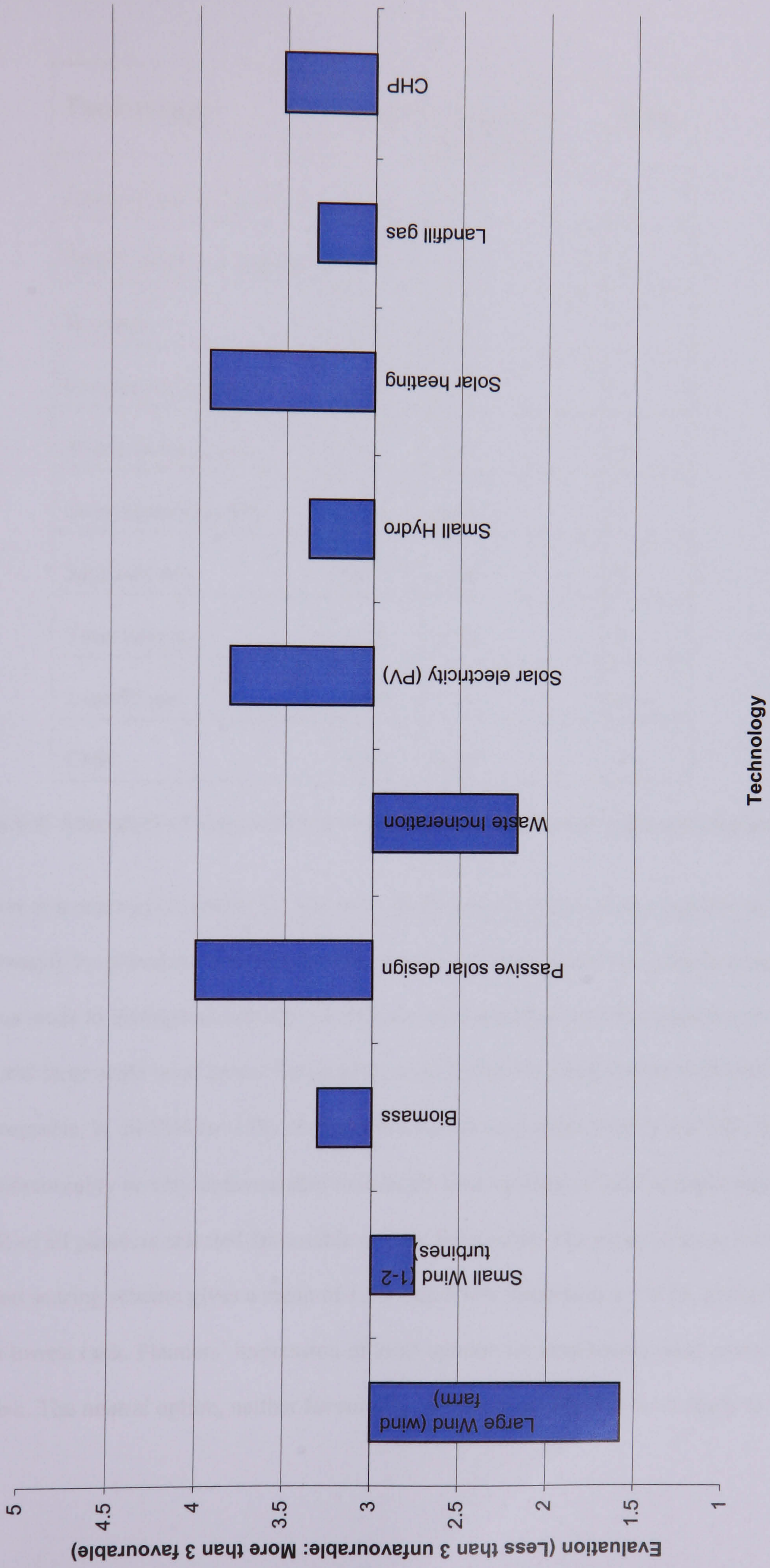
Most respondents disagreed with items 1 and 3, although in both cases the rank with most responses was “neither agree nor disagree”. For item 1 *“Renewable energy is too expensive to generate at present”*, 39% (n=133) selected “neither agree nor disagree” and in total 43.4% (n=148) selected disagree or disagree strongly. Item 3 *“Renewable energy technologies are*

unreliable” had 38.9% (n=131) selecting “neither agree nor disagree” and 52.5% (n=177) selecting disagree or disagree strongly.

The data was separated into the sub-groups previously identified (i.e. urban/rural and DC/strategic) for analysis of difference of means, using an independent groups T test. The data showed surprisingly high levels of consensus between the sub-groups. No significant variations in the means of the urban and rural planners were identified. Comparing the DC and strategic planners two statistically significant variations were identified. DC officers were more likely to agree that renewables are too expensive (item 1) ($t(261) = -2.047, p < 0.042$). DC officers in contrast were less positive about the need for more renewables (item 5) ($t(85.236) = 2.757, p < 0.026$). These results suggest that DC officers do not have as positive an attitude to renewables as strategic planners and may be less likely to view renewables positively in the planning process.

There is evidence that some renewable technologies are more likely to have problems in achieving planning permission, so the views of the planning officer on the acceptability of each of the different technologies to the local community were investigated (question 24). This data does not measure the opinion of the local community, but only the planning officer’s perception of that opinion. To aid the analysis of trends the selected rank for each item was given a score value. Those technologies ranked as very acceptable scored 5, the remaining scores cascaded down with very unacceptable scoring 1. Thus the mean scores shown below are reversed in comparison to the original questionnaire. This is shown in Table 6.4 and illustrated graphically in Figure 6. 4.

Figure 6.4. Planners Perception of the Acceptability of Renewable Technologies to the Local Community



Technology	Mean	Standard Deviation	Rank
Large Wind (wind farm)	1.58	0.84	10
Small Wind (1-2 turbines)	2.75	1.07	8
Biomass	3.31	0.94	7
Passive solar design	4.01	0.79	1
Waste Incineration	2.17	1.17	9
Solar electricity (PV)	3.82	0.85	3
Small Hydro	3.37	1.08	5
Solar heating	3.94	0.78	2
Landfill gas	3.33	1.11	6
CHP	3.52	0.98	4

Table 6.4: Summary of means for the acceptability of different renewable technologies

Wind power as a renewable technology was most likely to be considered unacceptable to the local community by planners. However the size of wind installation can vary significantly so an attempt was made to distinguish between small scale wind installations of perhaps one or two machines and large scale wind farms. Large-scale wind farms were most likely to be considered very unacceptable. In all 53% (n=178) of planners selected very unfavourably and 78% (n=248) selected unfavourably or very unfavourably to indicate their opinion of local acceptability. Only 2.4% (n=8) of all planners selected favourable or very favourable. The mean of these results on the allocated scoring scheme gives a mean of 1.58 with a low dispersion $\sigma = 0.84$, giving large scale wind lowest rank. Planners' impression of local opinion for small-scale wind power was less negative. The neutral option, neither favourably nor unfavourably was most likely to be

selected with 29.9% (n=102), but there were a higher proportion of planners who felt that this technology might be favourably received 23.2% (n=79), than for large-scale wind. Overall small-scale wind scored higher with a mean of 2.75 and a rank of 8, the spread of opinions is illustrated in the larger dispersion $\sigma = 1.07$.

The majority of respondents selected neither favourable nor unfavourable for biomass with 37.6% (n=120) selecting this choice. However 40.1% (n=128) selected favourable or very favourable compared to 15.7% (n=50) selecting unfavourable or very unfavourable when considering the community acceptability of biomass. This is shown in the mean of 3.31 from the scoring scheme, with a dispersion of $\sigma = 0.94$.

Passive Solar Design (PSD) was viewed as favourable to the local community, with 78.9% (n=261) selecting favourable or very favourable compared to 4.4% (n=14) selecting unfavourable or very unfavourable. PSD returned the highest mean score of all the technologies, 4.01 and a low dispersion of results as shown by $\sigma = 0.79$.

Waste incineration was felt to be much less acceptable to local communities, with 64.5% (n=216) of planners selecting unfavourable or very unfavourable as their response. In comparison 15.5% (n=52) selected favourable or very favourable. Waste incineration had the lowest mean score after large scale wind, with 2.17, but showed a wider dispersion of results, with $\sigma = 1.17$

Solar electricity or PV was considered to be viewed favourably by local people, with 51.5% (n=176) selecting favourable and 60.3% (=236) selecting favourable or very favourable. This can be compare to 5.7% (n=19) who felt PV would be unfavourably or very unfavourably received. PV was third most popular technology with a mean score of 3.82 with a small dispersion of results $\sigma = 0.85$.

The opinion of planners on the response to small hydro was less certain. The majority of responses were either neither favourable nor unfavourable (23.7% n=79) and favourable (22.8%, n=76). This gives a mean of 3.37 and a dispersion of $\sigma = 1.08$. However a large number of respondents 30.6% (n=102) felt that this technology was not applicable to their area. Small hydro was more likely to be considered inapplicable to planners' local area than any other technology.

Solar Water heating (SWH) was considered to be an acceptable form of renewable technology to local people. Over half of all respondents (54.9% n=184) felt that this technology would be acceptable to the local community and 76.4% (n=256) selected favourable or very favourable. In comparison only 3.9% (n=13) selected unfavourable or very unfavourable. The scoring scheme returned a mean of 3.94 for SWH. The agreement across officers was indicated by the low dispersion of results $\sigma = 0.78$, the lowest in this section.

Most respondents felt that landfill gas was likely to be acceptable to the local community with 30.7% (n=103) selecting favourable and 43.8% (n=147) selecting favourable or very favourable. However there were a considerable number, 20% (n=67) selecting unfavourable or very unfavourable and 29% selecting neither favourable nor unfavourable. These selections led to a score of 3.33, but the large range of returns is illustrated by the rather high standard deviation $\sigma = 1.11$.

Combined heat and power (CHP) was viewed similarly to landfill gas. The selections chosen by respondents were almost equally divided between favourable 35.4% (n=118) and neither favourable nor unfavourable 33.9% (n=113). This returned a mean of 3.52 but with a smaller standard deviation $\sigma = 0.98$ than found for landfill gas. These results are summarised below in Table 6.5.

Considering any differences across the sub-groups identified, it was found once again there was a very high degree of consensus, with no statistically significant variations between the sub-

groups. This result is surprising and the level of consensus is extremely high, for example on large scale wind the mean scores for urban (1.59) and rural are almost identical (1.58); similarly DC (1.72) and strategic (1.59) have mean scores very close to each other. Thus large scale wind is perceived as unpopular in the local community by all planners. The solar technologies are perceived as likely to be well received by local communities.

Item	Very Unfavourably	Unfavourably	Neither favourably nor unfavourably	Favourably	Very Favourably	N/a
Large Wind	53% (n=178)	20.8% (n=70)	11% (n=37)	1.8% (n=6)	0.6% (n=2)	12.8% (n=43)
Small wind	13.8% (n=47)	24.0% (n=82)	29.9% (n=102)	23.2% (n=79)	2.6% (n=9)	6.5% (n=22)
Biomass	3.8% (n=12)	11.9% (n=38)	37.6% (n=120)	32.3% (n=103)	7.8% (n=25)	6.6% (n=21)
PSD	0.6% (n=2)	3.6% (n=12)	16% (n=53)	53.2% (n=176)	25.7% (n=85)	0.9% (n=3)
Waste	35.2% (n=118)	29.3% (n=98)	16.7% (n=56)	11.3% (n=38)	4.2% (n=14)	3.3% (n=11)
PV	2.1% (n=7)	3.6% (n=12)	22.9% (n=77)	51.5% (n=173)	18.8% (n=63)	1.2% (n=4)
Small Hydro	4.8% (n=16)	7.8% (n=26)	23.7% (n=79)	22.8% (n=76)	10.2% (n=34)	30.6% (n=102)
SWH	0.9% (n=3)	3% (n=10)	18.5% (n=62)	54.9% (n=184)	21.5% (n=72)	1.2% (n=4)
Landfill gas	6.6% (n=22)	13.4% (n=45)	29% (n=97)	30.7% (n=103)	13.1% (n=44)	7.2% (n=24)
CHP	3.6% (n=12)	8.1% (n=27)	33.9% (n=113)	35.4% (n=118)	14.7% (n=49)	4.2% (n=14)

Table 6.5. Summary of responses on the acceptability of different renewable technologies

6.4. Discussion

Land use planning has been identified as an appropriate arena to integrate national policy at local level (Chapter 2). If this is to occur planners must be able to consider policy actions across all policy areas, not just those associated with land use planning. The integration of a specific policy area, i.e. energy in the land use planning process has been studied further (Chapter 3). The awareness of local energy policy and attitudes to renewable energy are important if integration is to occur.

6.4.1. Sustainable Development

The statistical results presented in the previous section show that there are surprisingly high levels of consensus amongst planners on the issues they feel to be of “most importance when planning a new development”. In total four items were most likely to be selected, namely:

- Minimising the loss of open land
- The quality of the built environment
- Increasing the vibrancy of the local economy
- Reducing car journey length and number

These four items were the only ones that received above the average number of votes (77.5 votes) across the items. This result suggests that planners are not considering all issues across policy areas in an integrated way but concentrating on issues that have resonance within the land use planning process as discussed in Willis (1995). This finding supports the research hypothesis that planners are giving more weight to some issues than others. What are the national and local drivers that lead to these items being at the top of the list for planners?

The selection of “the Quality of the built environment” as the most important issue is perhaps no surprise as this is in many senses the *raison d’être* of town planning. Recently the urban

renaissance movement in urban design and planning has reinforced this traditional planning value. It is clear that planners will have this very much in their minds when devising plans or assessing planning applications and we can expect it to be given serious weight in planning decisions. However, this question does not identify what, precisely, planners mean by “the quality of the built environment”. It is possible that different planners could associate quality with very different styles of development.

Use of land is also central to planning policy and the loss of green field sites to housing developments has been an increasingly contentious issue throughout the 90’s. There has been agreement across many lobby groups, including green campaigners, countryside associations and others, leading Government to adopt policies that favour redevelopment of previously developed land and an increase in urban densities. A 60% target for homes built on previously developed land by 2008 is included in the Governments Sustainable Development Strategy (Quality of life counts headline indicator H14). Planning policy guidance, particularly in PPG 3 (Housing) and PPG 6 (City centres), encourages a move back into the city centres for housing, with many underused commercial buildings being redeveloped as flats and prestige apartments. These drivers have increasingly pushed the issue of greenfield development up the agenda. It is undoubtedly a key driver of land use policy. However development on brown field sites does not necessarily deliver sustainable development.

Transport issues have also risen up the political agenda over 1990’s. The provision of roads involves a loss of green field land and the lobby groups that have campaigned against this have been quite successful in raising public opinion against the loss of countryside. The Government has put in place a variety of actions to try to reduce traffic and encourage a transfer to public transport. Most of these programmes involve awareness raising and trying to change patterns of behaviour and there is no specific target adopted. As yet there is little evidence that these programmes are making much impact, road traffic continues to grow and is forecast to grow for sometime. Real changes in transport are likely to involve some very hard decisions, some of

which are unlikely to be politically acceptable as yet. Local planning must also address local issues such as road safety and congestion issues. Local drivers, such as air quality management targets and local opinion may be more important as drivers of local policies on journey reduction.

Planning is often seen as a barrier to business with planning delays and difficulties causing difficulties for businesses, with loss of revenue and reduced profits. The Government has introduced measures that seek to streamline the planning process in their latest planning Bill. However, these results show that planners place vibrancy of the local economy high on their list of important issues when planning a new development. Planners operate within their local community and make their decisions based on the needs and aspirations of the local community. Economic vitality is an issue that most local people will also feel is important.

The remaining items all scored below average. Some of the items fall directly into the remit of other agencies, within or separate from the local authority; for example improving waste management falls under the remit of the councils waste department; minimising pollution and water use are part of the remit of the Environment Agency. These areas may be seen as outside the remit of land use planners. Education, crime and health are similarly organised by other bodies. Effective integration of policy requires partnership and cooperative working with other agencies and departments, but the lack of weight given to these items does not suggest an integrated approach is taking place.

The remaining low scoring items that are land use issues are generally poorly supported by national planning guidance. However, these issues may become more important as changes in policy come through, for example the adoption of PPG 25 on development on flood plains may bring water conservation and drainage higher on planners list of priorities. The policy areas given most support in national guidance are more likely to be carried forward in local plans. Local issues may then further influence policy, but if sustainability is poorly understood by the

local population then it may be more difficult to act on less acknowledged or more contentious areas. There is then a risk that the issues considered to be of most importance will overshadow the wider ideal of sustainable development and an integrated approach to sustainable development will be impossible.

It is also apparent from the results that development control officers are even more sharply focussed on these main land use problems. Strategic planners are shown in the analysis to be more likely to select from a wider range of the issues identified. Thus it may be that within the plan preparation process policies are selected to cover a wider range of sustainable development areas, but are perhaps more narrowly interpreted in the development control process, where time and resources can be stretched. The statistical results support the hypothesis that development control officers in some cases have different attitudes to the inclusion of sustainable development compared to strategic planners, although there is high consensus across the issues identified as most important. It may be that specific action targeted at DC officers is necessary to highlight the connectivity of different aspects of sustainable development.

6.4.2. Local Energy Policy

The results from the survey indicate that whilst almost half of all planning officers were aware of a local authority energy policy, very few had included any measures that encouraged energy efficiency. Only 5.4% asked for energy efficiency standard greater than required by Building Regulation and only 8% asked for any other energy efficiency measures. Large numbers of respondents “Don’t Know” for all of the questions. A lack of knowledge of local energy policy, implies that energy policy will not be integrated into land use planning policy. The statistical results support the research hypothesis that planners are not aware of local energy policies. Development control officers are particularly unaware of local policy with even higher numbers responding, “don’t know”. This result is particularly interesting, since it may suggest that even

where strategic planners are seeking to implement policies on energy efficiency, development control officers are perhaps unlikely to pick them up and enforce them.

The questions posed do not allow the analysis of reasons for the low uptake of energy efficiency policy measures. Lack of time for the analysis of proposals has been commonly cited amongst planners as a particular barrier to the inclusion of new, innovative or additional measures (Hales, 2000). Planners are generally wary of asking for measures that may be difficult to defend at appeal. At the time of the survey energy efficiency was a matter for Building Control Regulations and was not addressed within planning policy guidance in any shape. Since that time PPG3 has been revised and now does contain a short reference to the importance of energy efficiency in new developments. It is not possible to assess whether that change has made any difference. It is clear that the planning process itself is making little impact on energy efficiency uptake, in spite of much good quality guidance from the Good Practice Programme. Any energy efficiency improvements are likely to arise through uptake in the design and construction industry.

6.4.3. Renewable Energy

Planning has been seen as a barrier to renewable energy. However it is clear from the responses to this survey that the majority of planners are generally positive about renewable energy, with 88.6% of planners agreeing or agreeing strongly with the statement “More of our energy should come from renewable sources” and thus refuting the research hypothesis that planners see renewable energy in a negative light. Nearly 2/3 of planners felt that local authorities should lead on renewables, although over 90% felt that more Government action was needed. Planners did not identify the cost or reliability of the technology as a major problem, although development control officers were more likely to consider renewable energy as expensive. Development control officers were a little less positive that more of our energy should come from renewables, and were more likely to feel that renewables were expensive. Thus the

statistical results do support the hypothesis that DC officers have somewhat different attitudes to strategic planners.

Planners were less sure of the response of their local community to renewables. Although over 40% felt that their communities would welcome more renewables, a similar number could neither agree nor disagree with this statement. Most planners also felt that locals were unfamiliar with renewables. From these responses it would seem that whilst planners recognise the benefits of renewables they are less convinced of the response of the local community.

This uncertainty is further illustrated by the responses on the acceptability of different renewable technologies to the local community. Wide variations in the acceptability of different technologies were found, refuting the research hypothesis that all forms of renewable energy would be equally acceptable. Large-scale wind developments and energy from waste plant, which have been the subject of a number of controversial applications, are perceived as very unacceptable to local communities. In contrast the solar technologies, PSD, solar water heating and PV, are seen as very acceptable. These technologies raise very few adverse planning considerations; they are easily accommodated within the built form with low visual impact. They have no impact on roads or traffic and create no local pollution. PSD does have implications for the design and layout of developments, which may impact on issues such as crime prevention and privacy of dwellings as well as possible visual impact. These technologies have not been the subject of adverse publicity and are generally very low key, so perhaps, judged less likely to be unacceptable to local people.

The perception of community support or hostility could have a significant impact on the planning decision making process. If planning officers wish to encourage developments, such as renewables, which contribute to sustainable development, then if they are poorly supported by national and local policy, they may find themselves less willing to support such developments if they feel that local communities are likely to object, particularly if there is a lack of local

political support from elected councillors. Planning officers who have no interest or knowledge of renewables may be even less likely to consider supporting a proposal that they see as potentially contentious. If locally elected councillors also have a similar perception of community support for renewables then they are even less likely to support a development that they consider will be contentious in the local community.

Surprisingly there were no significant differences between planners in rural areas compared to planners in urban areas. All of the different renewable technologies were given similar scores. In the same way there were no significant differences of opinion between DC and strategic planners, thus refuting the hypotheses that differences in attitudes would be found.

A highly discretionary process such as planning is open to influence from a variety of parties engaged in development. Planners generally wish to see the application proceed as smoothly as possible. Most planners canvassed in this survey felt that the planning process was generally relatively straightforward. This is true where national and local policy frameworks are clear and development meets agreed goals and targets. However, when development is less clearly supported, or where policy is less clearly articulated, for example to support renewable energy, it is clear that conflicting views may emerge. Managing conflict is a longer process, taking up time and resources, with the risk of missing internal performance targets. If then there is a perception that the development will not be acceptable locally then there may be little incentive to support the application.

However, as renewable energy continues to be supported in national policy, planners will be increasingly called upon to consider energy supply issues. In the recent study for a 100% renewable development at Ashton Green in Leicester, Leicester City Councils planners were “at sea” when considering renewables (Tomie et al, 2001) and were very reluctant to consider large scale wind at Ashton Green. The perceptions identified here will have significant impacts on policy development and support through SPG as well as in development control decisions.

Chapter 7 Conclusions and Recommendations for Further Work

This research has both supported the findings of previous research and has produced new information on the opportunity for delivering sustainable development through integrated policy delivery via the land use planning system and the function of planning tools to support this role. It has also provided an insight into the role of land use planning in delivering a sustainable approach to energy use and generation. In particular, it investigated planners' attitudes to renewable energy, an area previously not covered in planning research.

Integrating Sustainable Development

Sustainable development is an overarching principle and integration of policy aims, objectives and actions is necessary to deliver it. Whilst the Government have identified the need to integrate policy to address complex problems, in practice, research has found integrated policy is difficult to achieve as individual actors have their own key objectives to deliver and overarching principles can be neglected (Barling et al., 2002). The Government has adopted a series of indicators to monitor progress on policy and the delivery of sustainable development and in some cases a target has been adopted as a milestone to be reached as part of the policy progress. However, there is a danger that policy will then become target driven and the once again overarching objectives overlooked.

The difficulties of policy integration are illustrated by the review, in chapter 3, of the latest energy policy objectives, which fail to fully address the Government's sustainable development objectives. The energy policy objectives fall short of the sustainable development objectives and

in some instances could militate against sustainable development. The sustainable development indicators and targets that monitor energy policy goals are incomplete and in some cases lack strength. Current energy policy relies on the market to deliver policy goals wherever possible, but the market is not structured to properly value wider social and environmental concerns. An energy hierarchy could offer a means to guide policy in a more sustainable way, as could wider adoption of an energy services approach.

Land use planning, whilst primarily concerned with development of land, interacts with many policy areas including transport, crime prevention, environmental protection, housing and economic development. Thus, there is an opportunity to integrate national policy and deliver national targets at local level (Vigar and Healey, 1999), through local policy in development plans and local enactment through development control. Planning seeks to balance community good with individual requirements, business needs with those of the community; development needs with protection of the environment. Thus, planning offers a real opportunity to deliver sustainable solutions at the local level. Regional and local structures are at an appropriate scale to engage multiple stakeholders and policy can be assessed against national and local sustainable development objectives, indicators and targets.

Land use planning is a quasi-judicial process. Decision-making is largely discretionary within a framework of national and regional guidance. Sustainable development is slowly being integrated in national guidance and local policy (Hales, 2000). But support for sustainable development policy can be weak and innovative approaches are often difficult to support through the planning decision making process (Counsell, 1999, Counsell, 2002.). The decision making process is influenced by the value systems of the planners and the different stakeholders involved in the process of devising local policy and enacting development control decisions.

Whilst a large number of issues are potentially considered, research shows that the issues identified by planners as most important are likely to have most weight (Willis, 1995)

This research illustrates that there is a high level of consensus amongst planners on the important issues relating to sustainable development. These are quality of the built environment, loss of open land, reducing journey number and length and vitality of the local economy. These choices are either close to the main objectives for planning, or are well supported by Government guidance. This level of consensus brings into question whether other issues are likely to be integrated into planning, particularly those areas that are weakly supported by policy, or which fall to the remit of a different department. It may also be that where planning decisions are difficult or protracted, the non-core policy areas may be less likely to be included or supported in the planning process.

A variety of tools have been identified as means of integrating sustainable development throughout the planning process. This research has illustrated the value of sustainability appraisal for integrating sustainable development across policy arenas. Appraisal engages key decision makers in a process of considering different policy goals and assessing how they integrate and support each other to deliver beyond their own narrow goal. Sustainability appraisal can help to deliver clearer, more focussed plans and guide the policy process, as has been illustrated in the development of the East Midlands Regional Planning Guidance. The adoption of an integrated approach in the East Midlands has had significant impact on the development of all regional strategies, particularly with the adoption of a common framework of objectives in the Integrated Regional Strategy, the East Midlands' Regional Sustainable Development Framework.

The new legislation on planning is expected to simplify and streamline the planning process. However, it is not clear that the delivery of sustainable development will be supported any better in the streamlined approach than it is now. Delivering sustainable development relies on careful and coherent policy at national and local level supported by meaningful targets and indicators. Stronger action on sustainability through the planning system needs to be better supported to allow planners more scope for action. The engagement of the local community and

locally elected representatives to build consensus is also important. However, planners also need to be committed to delivering sustainable development and if planners give low priority to some important issues then sustainable solutions will be less achievable. Planning tools can aid the policy preparation and decision making process, but the planners' role is critical.

Sustainable Energy

Energy policy has an important function in delivering sustainable development, particularly in relation to climate change. Current energy policy has moved towards providing a more integrated framework for sustainable energy use, but as illustrated in this research, still falls short of a fully sustainable approach. There are also important gaps in policy, particularly the lack of a market for heat, which compromise the potential for sustainable solutions to energy generation and use.

Land use planning and energy policy have few areas of overlap, but there are important aspects of energy use and generation that can be addressed through the land use planning system. One aspect is in reducing energy demand in buildings and for reducing travel through design and layout of development. The second is in the development of renewable energy capacity.

Reduction of energy demand through development design is not addressed in current energy policy and is poorly supported in planning policy guidance. Local government has sought to develop local energy policy either in local plans or as separate strategies. Guidance is available on good practice (Barton, 1995) and some authorities (e.g. Leicester City Council, 2002) have developed specific guidance using Supplementary Planning Guidance, similar to the model guidance (Appendix B) developed for this research. But energy efficiency is generally seen as a Building Control function and not a planning matter and this research shows that large numbers of planners are unaware of local energy policy. Development control officers are found to

less aware of local policy than strategic planners. Enactment of local energy policy is compromised by lack of knowledge and a lack of an integrated approach.

Renewable energy development is supported in national energy policy, but is perceived to be hampered in the planning process. National guidance provides some support for renewables and most authorities include some form of policy in their plans, but the strength of policy support is variable (Cradick, 2000). Planning has been seen as a barrier to renewable energy developments, but there has been no research in planning literature on the attitudes of planners to renewables. If planning is a barrier, we might expect planners' attitudes to renewable energy to be rather negative. However, it is clear from this work that planners have positive attitudes towards renewable energy and believe that more of our energy should come from renewable sources. Indeed, research (Hartnell, 2001) shows that only some technologies, particularly wind and waste, are really having trouble in the planning process.

Planners are more ambivalent about the acceptability of renewables to their local communities, they are unsure that local communities are familiar with renewables. In addition, planners feel that certain technologies, namely wind and energy from waste, are highly unacceptable to local communities. Development control officers are found to be even less confident of their local community's views. So, whilst planners themselves have positive attitudes, they may be influenced by a perception of community antipathy to some renewables when deciding on proposed developments. This research suggests that the planning process is not necessarily a barrier to planning, but that some renewable technologies are contentious perhaps because of their perceived impact on the local environment.

The new planning process, when adopted, is unlikely to be able to resolve the difficulty in planning for certain technologies, unless there is a consensus built up on the appropriate location or use of these technologies. Clear policies on renewable energy are essential for local development decisions. Supplementary Planning Guidance is a powerful tool for supporting

policy enactment and is likely to increase in importance once the new planning legislation comes into being. The model SPG developed as part of this work has been adapted for use in Leicester City Council as a means of support policy on energy.

Further Research

This research has brought forward a number of interesting findings and in the process identified new questions for research. Four specific areas for further study are identified:

Planning officers give much importance to the quality of the built environment. This is obviously at the core of planning principles. However it was not possible in this research to identify how planners interpret the quality of the built environment. It is clear that some of the tools reviewed here are relevant to the process of defining a quality built environment, particularly Supplementary Planning Guidance. Further study to identify what aspects of development are important in ensuring a quality built environment would be of value, particularly as local regeneration falls more and more to local strategic partnerships and regional development agencies.

In view of planners perception of the acceptability (or lack of it) of different renewable energy technologies to the community it would be of value to measure both planning officers' perceptions of local opinion in conjunction with that local opinion to see whether planning officers are correct in their evaluation of their local area. The attitudes of elected members should also be incorporated into any future research, since they are the elected representatives of the community and provide the link between community feeling and planning decisions. This future research should also seek to ascertain where and in what form (i.e. small or large installations) unpopular renewable technologies are more acceptable. This would help both developers in siting decisions and planners in policy development.

Increasingly regional renewable resource assessments are being used to produce regional targets for renewable energy. These resource assessments are a useful tool for identifying appropriate locations for some renewable technologies. However, the regional level is still somewhat remote from the local authority planning decision making process. If renewable technologies are perceived as unacceptable to local communities and there are good planning reasons for refusal it may still be that some technologies are hampered by the planning process. Further research to develop a methodology to identify locally acceptable sites that meet regional targets would be of great benefit.

It is clear that there are some differences between policy development and policy enactment through development control. Supplementary planning guidance provides a means of supporting policy through development control and as such is a useful tool. However, there is a need to assess the use of SPG in development control decisions and its level of success in supporting policy enactment.

References

- Alden J. and C. Offord (1996) Regional Planning Guidance. In Tewdwr –Jones, M. (ed) British Planning Policy in Transition: Planning in the 1990s. London: UCL Press.
- Allmendinger, P. and Tewdwr-Jones, M. (2000) New Labour, New Planning? The Trajectory of Planning in Blair's Britain. *Urban Studies*, 37, 1 pp1379-1402.
- Barling, D., Lang, T. and Caraher, M. (2002) Joined-up food policy: the trials of governance, public policy and the food system. *Social Policy and Administration*, 36, 6, 556-574.
- Barrett, J., Vallack, H., Jones, A. and Haq, G. (2002) The Eco Footprint of York; York lifestyles and their environmental impact. York: Stockholm Environment Institute
- Barton, H. Grant, M. and Guise, R (2003). *Shaping Neighbourhoods: A Guide for health, sustainability and vitality*. London: Spon
- Barton, H., Davis, G. and Guise, R. (1995) *Sustainable Settlements: A guide for Planners, Designers and Developers*. Bristol: UWE and LGMB
- Bathurst, G. and Strbac, G. (2001). The value of intermittent renewable sources in the first week of NETA. Tyndall briefing note no.2. Tyndall Centre for Climate Change Research, Norwich.
- Batley, S.L., Colbourne, D., Fleming, P.D. and Urwin, P. (2001). Citizen versus consumer: challenges in the UK green power market. *Energy Policy*, 29 (6), p479-487.
- Batley, S.L., Fleming, P.D. and Urwin, P. (2000). Willingness to Pay for Renewable Energy: Implications for UK Green Tariff Options. *Indoor and Built Environment*, 9 (3-4), p157-170.
- Benneworth P., P. Roberts, L. Conroy (2001) RDAs as Foci for New Regional Strategies The Case of sustainable Regional Development Regions, 231, pp.16-34
- Benson, J.F. (2001) What's the alternative? Impact assessment tools and sustainable planning. SUSPLAN 2001 Conference proceedings Newcastle 29-31 August
- Berube, G. and Villeneuve, F. (2002) Ethical Dilemmas and the Decision Making Process: Is consensus Realistic. *Energy Policy*, 30, pp 1285 -1290.
- Bishop, K., Tewdwr-Jones, M. and Wilkinson, D. (2000) From Spatial to Local: The Impact of the European Union on Local Authority Planning in the UK. *Journal of Environmental Planning and Management*, 43,3, pp309-334.
- Blowers, A. (1997a). *Society and Sustainability*. In Blowers, A. and Evens, B. (eds) *Town Planning into the 21st Century*. London: Routledge.
- Blowers, A. (1997b). *Environmental Planning for Sustainable Development*. In Blowers, A. and Evens, B. (eds) *Town Planning into the 21st Century*. London: Routledge.
- Bond, A.(1997) *Environmental Assessment and Planning: A Chronology of Development in England and Wales*. *Journal of Environmental Planning and Management*, 42, 2, pp 261 -271.

- Branston, J.R. (2002) The Price of Independents: An analysis of the Independent Power Sector in England and Wales. *Energy Policy* 30 p 1313-1325
- Breheny, M. (1998) Food for thought on housing provision, *Town and Country Planning* 67, 9, pp272.
- Briassoulis, H. (1999). Who plans whose sustainability? Alternative roles for planners. *Journal of Environmental Planning and Management*, 42, 6, 889-902.
- Brownhill, D. and Rao, S. (2002) A Sustainability Checklist for Developments: A common Framework for Developers and Local Authorities. London: BRE
- Buckingham-Hatfield S. and Evans B. (1996) Achieving Sustainability through Environmental Planning. In Buckingham-Hatfield, S. and Evans, B. (editors), *Environmental Planning and Sustainability*. Chichester: John Wiley and Sons Ltd.
- Bunnell, G. (1995) Planning Gain in Theory and Practice: Negotiation of Agreements in Cambridgeshire. *Progress in Planning*, 44, 1, pp1-113.
- Chadwick H.M., P. Devine-Wright and P. Fleming (2001) The use of sustainability appraisal in strategic spatial planning. A case study of the East Midlands Regional Planning Process. SUSPLAN 2001, Newcastle
- City of Lincoln Council (2000) Supplementary Planning Guidance: Green design in planning. Lincoln: City of Lincoln Council.
- Claydon, J. (1998). Discretion in development Control: A Study of How discretion is Exercised in the Conduct of Development Control in England and Wales. *Planning Practice and Research*, 13, 1, pp 53 – 62.
- Claydon, J. and Smith, B. (1997) Negotiating Planning Gains through the British Development Control System. *Urban Studies*, 34, 12, pp 2003-2022.
- Cooper, J., Ryley, T. and Smyth, A. (2001) Energy tradeoffs and market responses in transport and residential land use patterns: Promoting sustainable development policy. *Urban Studies*, 38, 9, 1573 -1588
- Counsell, D. (1999) Sustainable Development and Structure Plans in England and Wales: Operationalizing Themes and Principles. *Journal of Environmental Planning and Management*, 42, 1, pp 45 -61.
- Counsell, D. (2002). Prudent Pessimism of Sitting on the Fence: Has the Precautionary Principle a Role in UK Development Plans? *Planning Practice and Research* 17, 1, pp 5 - 16.
- Cowell, R. and Owens, S. (1997) Sustainability: The New Challenge. In Blowers, A. and Evans, B. (eds) *Town Planning into the 21st Century*. London: Routledge.
- Cradick, K. (2000). Back to the Future. *New Review*, 45, p6-7.
- Department of Environment (1994) *Regional Planning Guidance for East Midlands (RPG8)*. London: HMSO
- Department of Environment (1981). *Planning Gain*. Property Advisory Group. London: HMSO.

Department of Environment (1990) Regional Planning Guidance, structure plans and the content of development plans (PPG15). London: HMSO

Department of Environment (1990). This Common Inheritance. London: HMSO

Department of Environment (1992) Development Plans and regional planning guidance (PPG12). London: HMSO

Department of Environment (1993) Environmental Appraisal of Development Plans: A Good Practice Guide. London: HMSO.

Department of Environment (1993) Environmental Appraisal of Development Plans – a good practice guide London: HMSO

Department of Environment (1993). Planning Policy Guidance Note 22: Renewable Energy. London: Office of the Deputy Prime Minister.

Department of Environment (1994). Sustainable Development: The UK Strategy. Cm 2426. London: HMSO

Department of Environment (1996) Indicators for Sustainable development. London: HMSO
East Midlands Regional Planning Forum (1992) Regional Strategy for the East Midlands.
EMRPF

Department of Environment (1996). Planning Policy Guidance Note 6: Town Centres and Retail Development. London: Office of the Deputy Prime Minister.

Department of Environment (1997a). Planning Policy Guidance Note 1: General Policy and Principles. London: ODPM

Department of Environment (1997b). Planning Obligations. Planning Circular 1/97. London: ODPM

Department of Environment Transport and the Regions (2000c) Guidelines for Sustainability Appraisal of Regional Planning Guidance. London: The Stationery Office

Department of Environment Transport and the Regions (undated). Building a Sustainable Future: Homes for an autonomous Community. General Information Report 53 Energy Efficiency Best Practice Programme. London: DETR

Department of Environment, Food and Rural Affairs, Department of Trade and Industry, Department of Transport, Local Government and the Regions (2002). Energy Policy: Key Issues for Consultation. London, Department of Trade and Industry.

Department of Environment, Transport and the Regions (1997) Building Partnerships for Prosperity: Sustainable Growth, Competitiveness and Employment in the English Regions Cm 3814. Norwich: Stationery Office

Department of Environment, Transport and the Regions (1997). Modernising Planning: A statement by the Minister for Planning Regeneration and the Regions London: DETR

Department of Environment, Transport and the Regions (1998). Modernising Local Government: Improving services through Best Value, London: DETR

Department of Environment, Transport and the Regions (1998b) Planning for Sustainable Development: Towards Better Practice. London: The Stationery Office.

Department of Environment, Transport and the Regions (1998c) Strategic Environmental Appraisal, Report of the International Seminar. B. Sadler and C. Brookes (editors), London: DETR

Department of Environment, Transport and the Regions (1998d). Building Partnerships for Posterity. London: DETR.

Department of Environment, Transport and the Regions (1998e). Sustainable Regeneration: A Good Practice Guide. London: ODPM. Available at <http://www.urban.odpm.gov.uk/publications/gp/sustainable/index.htm>. Last accessed 12/05/03

Department of Environment, Transport and the Regions (1999a) A Better Quality of Life: A Strategy for Sustainable Development for the United Kingdom. Cm 4345, London: The Stationery Office

Department of Environment, Transport and the Regions (1999b) Quality of Life Counts: Indicators for a Strategy for Sustainable Development for the UK: a Baseline Assessment. London: DETR

Department of Environment, Transport and the Regions (1999c) Planning Policy Guidance Note 12: Development Plans, London: DETR

Department of Environment, Transport and the Regions (1999d) Recommendations for a Good Practice Guide on sustainability appraisal of Regional Planning Guidance London: DETR

Department of Environment, Transport and the Regions (2000a). Climate Change - The UK Programme. Cm 4913, Norwich: Stationery Office.

Department of Environment, Transport and the Regions (2000b). Planning Policy Guidance Note 3: Housing. London: ODPM.

Department of Environment, Transport and the Regions (2000d) Regional Planning (PPG 11) London: ODPM

Department of Environment, Transport and the Regions (2000e) Regional Development Agencies Regional Chambers. London: DETR. Available at <http://www.detr.local-regions.detr.gov.uk/rda/chambers/index.htm>

Department of Environment, Transport and the Regions (2000f) Guidance on Preparing Regional Sustainable Development Frameworks. London: The Stationery Office.

Department of Environment, Transport and the Regions (2000g) Guidelines for Sustainability Appraisal of Regional Planning Guidance. London: DETR.

Department of Environment, Transport and the Regions (2001). Fuel Poverty Strategy. Norwich: The Stationery Office.

Department of Trade and Industry (1998) Energy Sources for Power Generation. DTI, London.

Department of Trade and Industry (1999) *New and Renewable Energy Prospects for 21st Century*. Norwich: The Stationery Office.

Department of Trade and Industry (2001a) *Energy Trends (December)*. London: DTI

Department of Trade and Industry (2001b) *Social, Environmental and Security of Supply Policies in a Competitive Market*. London: DTI.

Department of Trade and Industry (2002a) *UK Energy in Brief*. DTI, London. Available at http://www.dti.gov.uk/energy/inform/energy_in_brief/ last accessed 19th February 2003.

Department of Trade and Industry (2002b) *Energy – Its Impact on the Environment and Society*. DTI, London. Available at

Department of Trade and Industry (2003) *Our Energy Future – Creating a Low Carbon Economy*. Cm 5761 Stationery Office, Norwich. Available at:

Department of Transport, Local Government and the Regions (2001) *Planning: Delivering a Fundamental Change*, London: DTLR. Available at <http://www.planning.odpm.gov.uk/consult/greenpap/pdf/greenpap.pdf>. Accessed on 09/01/2003

Devine-Wright, P. Fleming, P.D. and Chadwick, H. (2001). The role of social capital in advancing regional sustainable development. *Impact Assessment and Project Appraisal*, 19(2), 161-167.

Devine-Wright, P., McAlpine, G. & Batley-White, S. (2001) *Wind turbines in the landscape: An evaluation of local community involvement and other considerations in UK wind farm development*. Proceedings of the 32nd Annual Conference of the Environmental Design Research Association, Edinburgh, Scotland, July 3-6th, p133-137.

Duffin, A. (1998). *East Midlands Renewable Energy Planning Study*. London, ETSU.

East Midlands Regional Assembly (2000a) *Step-by-step Guide to Sustainability Appraisal*. Melton Mowbray: EMRA

East Midlands Regional Assembly (2000b) *East Midlands Sustainability Checklist*. Melton Mowbray: EMRA

East Midlands Regional Local Government Association and the Government Office for the East Midlands (1999a) *Sustainability Appraisal of RPG: Proposed Methodology for Appraisal*. A report by ENTEC UK Ltd. Government Office for East Midlands: Nottingham

East Midlands Regional Local Government Association and the Government Office for the East Midlands (1999b) *Sustainability Appraisal of RPG; Appraisal Report*. A report by ENTEC UK Ltd. Government Office for East Midlands: Nottingham

East Midlands Regional Local Government Association and the Government Office for the East Midlands (1999c) *Practice Review*. A report by ENTEC UK Ltd. Government Office for East Midlands: Nottingham

East Midlands Regional Planning Forum (1996) *The Review of the Regional Strategy*. EMRPF

East Midlands Regional Planning Forum (1997) Sustainability Appraisal methodology and framework. EMRPF

Evans, B. (1997) From Town Planning to Environmental Planning. In Blowers, A.. and Evans, B. (eds) Town Planning into the 21st Century. London: Routledge.

Fells, I. (2000). Can the Energy Market Protect the Environment? *Interdisciplinary Science Reviews*, 25, 1, p 29 – 33.

Fleming, P.D; Webber, P; Chadwick, H. & Devine-Wright, P. (2001) Greenhouse gas inventory. In S. Shackley; J. Kersey; R. Wilby & P. Fleming (Eds.) *Changing by Degrees: The potential impacts of climate change in the East Midlands*. Ashgate Studies in Environmental Policy and Practice.

Fouquet R. and Pearson P.J.G. (1998). A thousand Years of Energy Use in the United Kingdom. *The Energy Journal* 19,4, pp 1-41

Friends of the Earth (undated) Energy and Environmental Space: Briefing Sheet. FoE London. Available at http://www.foe.co.uk/campaigns/sustainable_development/pdf/tworld/energy.pdf last accessed 13/02/03

Gibbs D. (1998) *Regional Development Agencies and Sustainable Development Regional Studies*, 32, pp. 365-381

Glasson, J. (1995) Regional planning and the environment: Time for a SEA change. *Urban Studies* 32, 4/5, 713-731.

Glasson, J. (1999) The first ten years of the UK EIA system: strengths, weaknesses, opportunities and threats. *Planning Practice and Research*, 14, 3, 363-375.

Glasson, J., Therivel, R., Weston, J., Wilson, E. and Frost, R. (1997) EIA - learning from experience: Changes in the quality of environmental impact statements for UK planning projects. *Journal of Environmental Planning and Management*, 40, 4, 451-464.

Government Office of the East Midlands (2002). *Regional Planning Guidance for the East Midlands (RPG8)*. London, The Stationary Office.

Greed, C. (1996). *Introducing Town Planning*. Harlow, Longman Ltd.

Green, R. (1996). Reform of the Electricity Supply Industry in the UK. *Journal of Energy Literature*, 2 (1), p3-24.

Hales, R. (2000) Land use Development Planning and the Notion of Sustainable Development: Exploring Constraint and facilitation within the English Planning System. *Journal of Environmental Planning and Management*, 43, 1 pp 99-121.

Hardin, G. (1968) Tragedy of the Commons. *Science*, 162, 1243-1248.

Hartnell, G. (2001). *Planning and Renewables: Implications for Meeting the Targets*. CREA Conference at IMechE, London, 22nd March.

Healey, P. (1996) Consensus-building across difficult divisions: new approaches to collaborative strategy making.

Healey, P. (1998) Regulating property development and the capacity of the development industry. *Journal of Property Research*, 15, 3, p 211-227.

Healey, P. (1999) Sites, Jobs and Portfolios: Economic Development Discourses in the Planning System. *Urban Studies*, 36, pp 27-42

Higgins, M. and Morgan, J. (2000). The role of creativity in planning: The “creative Practitioner”. *Planning Practice and Research*, 15, 1/2 , p117-127.

Hill, R., O’Keefe, P. and Snape, C. (1995) *Future Use of Energy*. London: Earthscan Publications

HM Government (1989) *The Future of Development Plans*. Cm. 569 London: HMSO

Hull, A. (1995). New Models for Implementation Theory: Striking a Consensus on Windfarms. *Journal of Environmental Planning and Management*, 38(3), p285-305.

International Energy Agency (2002) *World Energy Outlook*. Paris: IEA

Jacobs, M. (1997) *Making Sense of Environmental Capacity*. London: CPRE

Jay, S. (2001). Working towards Sustainability in Local authority Development Plans: With Reference to Policy on High Voltage Electricity Installation. SUSPLAN 2001, Newcastle

Keeble, L. (1969). *Principles and Practice of Town and Country Planning*. (4th Ed) London: Estates Gazette.

Land Use Consultants (2002) *Energy issues and the review of Regional Planning Guidance for the East Midlands (RPG8): Consultation Draft*. London: LUC

Leeds City Council (1998) *Supplementary Planning Guidance: Sustainable Development Design Guide*. Leeds: Leeds City Council.

Leicester City Council (2002). *Supplementary Planning Guidance: Energy Efficiency and Renewable Energy in New Developments*. Leicester, Leicester City Council.

Leicester City Council (undated) *The East Midlands Spatial Development Strategy – Review of the Sustainability Appraisal Process unpublished report*

Local Government Association (1998). *Energy Services for Sustainable Communities – The Local Government Position*. LGA, London

Mander, S., Buchdahl, J. and Shackley, S. (2000) *Carbon Counting*. Northwest England’s first inventory of greenhouse gases. Manchester: Manchester Metropolitan University’s Atmospheric Research and Information Centre.

Marshall (1998). *Economic Instruments and the Business Use of Energy*. London. H.M. Treasury.

McEvoy, D. Gibbs, D.C. and Longhurst, J.W.S. (1999) The prospects for Improved Energy Efficiency in the UK Residential Sector. *Journal of Environmental Planning and Management*. 42, 3 p 409 - 424

- Meadows D.H. et al (1972) *The Limits to Growth: A report for the club of Rome's Project on the Predicament of Mankind*. London: Earth Island
- Milborrow, D. (2001). *PIU Working Paper: Penalties for intermittent sources of energy*. London, Performance and Innovation Unit.
- Mitchell, C. (1995). *The Renewables NFFO: A review*. *Energy Policy*, 23 (12), p 1077-1091.
- Myerson G. and Rydin Y. (1996) *Sustainable Development: The Implications of the Global debate for Land Use Planning*. Environmental Planning and Sustainability Susan Buckingham-Hatfield and Bob Evans (editors), Chichester: John Wiley and Sons Ltd
- Naess, P. (2001) *Urban Planning and Sustainable Development*. *European Planning Studies*, 9, 4, 503-524.
- O'Riordan, T. (1999). *Planning for Sustainable Development: a Brave new world for emancipated planners*. TCPA, London
- Office of the Deputy Prime Minister (2001). *Planning Green Paper. Planning: Delivering a fundamental change*. London, Office of the Deputy Prime Minister.
- Office of the Deputy Prime Minister (2002a) *Planning*. London: ODPM. Available at <http://www.planning.odpm.gov.uk/> Accessed on 14/11/02
- Office of the Deputy Prime Minister (2002b) *Sustainable Communities – Delivering through Planning*. London: ODPM. Available at <http://www.planning.odpm.gov.uk/consult/greenpap/scdtp/index.htm>. Last accessed on 09/01/03
- Office of the Deputy Prime Minister (2002c) *Your Region, Your Choice: Revitalising the English Regions*. London: The Stationery Office
- Office of the Deputy Prime Minister (2002d) *Regional Planning Guidance 8: East Midlands*. London: ODPM
- Owen, S. (1994) *Land Limits and Sustainability: a conceptual framework and some dilemmas for the planning system*. *Trans Institute of British Geographers* 19, pp 439 - 456.
- OXERA Environmental and ARUP Economics and Planning (2002). *Regional Renewable Energy Assessments: A report to the Department of Trade and Industry and Department of Transport, London and the Regions*. London, Department of Trade and Industry.
- Pearce D. (1993) *Blueprint 3: Measuring Sustainable Development* London: Earthscan
- Performance and Innovation Unit (2002). *Energy Review*. London, Performance and Innovation Unit.
- Quinn, M.J. (1996) *Central Government Planning Policy*. In Tewdwr-Jones, M. (ed) *British Planning Policy in Transition: Planning in the 1990s*. London: UCL Press.
- Ram, B. (1995) *Tariffs and Load Management: A Post Privatisation Study of the UK Electricity Supply Industry*. *IEEE Transactions on Power Systems*, 10, 2, pp 111 - 1116

- Reade, E. (1987). *British Town and Country Planning*. Milton Keynes: Open University Press
- Rhodes, R.A.W. (1992) *Beyond Westminster and Whitehall: The sub-central Governments of Britain*. London: Routledge
- Royal Commission on Environmental Pollution (2000). *Energy – The Changing Climate*. The Stationery Office, Norwich.
- Royal Commission on Environmental Pollution (2002) *Environmental Planning*. Norwich : The Stationery Office
- Russell S. (1998) *Sustainability Indicators for the East Midlands: Possibilities, Users and Uses: A report for the East Midlands Regional Planning Forum and the Environment Agency* Nottingham: EMRPF
- Rydin, Y. (1997) Planning, property and the environment. *Planning Practice and Research*, 12, 1, 5-7.
- Rydin, Y. (1998) Land use planning and environmental capacity: reassessing the use of regulatory policy tools to achieve sustainable development. *Journal of Environmental Planning and Management* 41, 6, 749-765.
- Rydin, Y. (2000) *The public and local environmental policy: Strategies for promoting public participation*. London TCPA
- Rylatt, M., Gadsden, S. and Lomas, K. (2001) GIS based decision support tools for solar energy planning in urban environments. *Computers, Environment and Urban Systems*, 25, p 579 – 603
- SERPLAN Sustainability Panel (1996) *Strategic Environmental Assessment - a methodology and appraisal framework for the review of the Regional Strategy*, RPC2989a, SERPLAN
- Shepherd, A. and Bowler, C. (1997) Beyond requirements: Improving public participation in EIA. *Journal of Environmental Planning and Management*, 40, 6, 725-738.
- Simmons, C., Lewis, K. and Barrett, J. (2000) Two feet – two approaches: A component based model of ecological footprinting. *Ecological Economics* 32, 375-380.
- Smith, S. P. and Sheate, W.R. (unpublished) *Sustainability Appraisals of regional planning guidance and regional economic strategies: an assessment*.
- Stephenson, R. (1998). In what way and to what effect is technical information used in policy making? Findings from a study of two development plans. *Planning Practice and Research*, 13, 3, p 237-245.
- Tewdwr-Jones, M. (1996). *Land-use Planning Policy after Thatcher*. In Tewdwr –Jones, M. (ed) *British Planning Policy in Transition: Planning in the 1990s*. London: UCL Press.
- Tewdwr-Jones, M. (1997) *Plans, Policies and Intergovernmental Relations: Assessing the Role of National Planning Guidance in England and Wales*. *Urban Studies* 34, 1, pp141-162
- Tewdwr-Jones, M. and Phelps, N. (2000) *Levelling the Uneven Playing Field: Inward Investment, Interregional Rivalry and the Planning System*. *Regional Studies*, 34, 5, pp 429 - 440

- Tewdwr-Jones, M., Bishop, K. and Wilkinson, D. (2000) "Euroscepticism", *Political Agendas and Spatial Planning: British National and Regional Planning Policy in Uncertain Times. European Planning Studies*, 8, 5, pp 651 -668.
- Therivel, R. (1995a) Environmental Appraisal of development plans: current status. *Planning Practice and Research*, 10, 2, 223-234
- Therivel, R. (1995b) Environmental Appraisal of Development Plans 2: 1992 –1995, Working Paper 160, School of Planning, R. Therivel (editor), Oxford: Oxford Brookes University.
- Therivel, R., Doak J and Stott M. (1999) Sustainability Appraisal. *Town and Country Planning* January/February 1999
- Therivel, R., Wilson, E., Thompson, S., Heaney, D. and Pritchard, D. (1992) *Strategic Environmental Assessment*. Earthscan Publications Ltd.
- Tomie, I., Gledhill, A., Fleming P.D., Devine-Wright, P., Ajiboye, P., Ringer, K., Jones, K., Quigley, B., Corominas, J. and Perez, S. (2001). Ashton Green 100% Renewable Energy Community Project: Final Report to the European Commission. Altener Project number 4.
- United Nations Conference on Environment and Development (1992) Agenda 21. Geneva: UNCED
- Valler, D. and Betteley, D. (2001) The politics of Integrated Local Policy in England. *Urban Studies*, 38, 13, pp2393 -2413.
- Varma, A. (2003) UK's Climate Change Levy: Cost Effectiveness, Competitiveness and Environmental Impacts. *Energy Policy*. 31. p51-61
- Vigar, G and Healey, P. (1999). Territorial Integration and "Plan-led" Planning. *Planning Practice and Research*, 14, 2, 153-169.
- Webb, D. and Collis, C. (2000) Regional Development Agencies and the "New Regionalism" in England. *Regional Studies*, 34, 9, pp 857 – 873.
- West Midlands Regional Forum of Local Authorities (1992) *Sustainable Environment, Technical Report 1* Stafford: WMRFLA
- Weston, J. (2000) EIA, decision making theory and screening and scoping in UK practice. *Journal of Environmental Planning and Management*. 43, 2, 185-203.
- Willis, K.G. (1995). Judging Development Control Decisions. *Urban Studies*, 32, 7, pp 1065 - 1079.
- Winter, P. (1994) Planning and Sustainability: An Examination of the Role of the Planning System as an Instrument for the Delivery of Sustainable Development. pp 883 -900.
- Wood, C. and Jones, C. E. (1997) The effect of environmental assessment on UK local authority planning decisions. *Urban Studies*, 34, 8, 1237-1257.
- Wood, G. (2000) Ten years on: an empirical analysis of UK environmental statement submissions since the implementation of Directive 85/337/EEC. *Journal of Environmental Planning and Management*, 43, 5, 721-747.

World Commission on Environment and Development (1987) Our Common Future. Oxford: Oxford University Press.

Appendix A
Review of Energy Policy

UK Energy Policy Framework

Energy Supply

Since nationalisation of the electricity supply industry in 1950's, the UK energy infrastructure has developed around large-scale generators, with a comprehensive transmission infrastructure through the National Grid and state owned monopolies for supply. National and international events, such as the oil crisis in the 1970's and the discovery and exploitation of North Sea oil and gas in 1970s and 80s (Hill et al., 1995) have led to changes in fuel mix over time. However, the energy industry retains the same basic operational form. The gas supply industry is also operated through large-scale infrastructure.

During the 1980s the then Government saw the energy industry as a suitable candidate for privatisation, with liberalised markets allowing competition and providing the means to deliver cheaper energy. The history of the liberalisation of the energy market is covered elsewhere (Green, 1996).

Privatisation had begun to facilitate greater competition in the generation market. However, the market structure and the Pool trading mechanism were not always successful in delivering the lowest cost options (Green, 1996, Branston, 2002). Under the Utilities Act 2000 the trading mechanisms were replaced and updated; the New Electricity Trading Arrangements (NETA) came into effect in March 2001, soon to be revised and extended to the whole UK as British Electricity Trading and Transmission Arrangements (BETTA). These arrangements were based on half hourly bid prices and punished those generators who did not honour advance contract commitments (Milborrow, 2001).

The liberalisation of the energy market have led to a reductions in price, with a fall of 24% in the real price of domestic electricity between 1990 and 2001 and a fall of 22% in the real price of domestic gas over the same period(DTI, 2002a). However in liberalised energy market the other elements of government policy must be delivered via a regulator. Energy companies are subject to specific standards for price, quality of supply, environmental standards, and other matters, but the companies are free to operate in the market place as they choose within this regulatory framework. In relinquishing the control of energy to the markets the Government has lost much of its power to strategically plan for energy supply in the country (RCEP, 2000 Ch5). One example of this is the rapid market penetration of Combined Cycle Gas Turbines (CCGT). The market demand for CCGT has led to a rapid rise in gas

demand, reducing the diversity of supply and potentially leading to system viability questions in the event of significant increases in gas price (Branston, 2002).

In order to address the need to act on greenhouse gas emissions the Government has needed to employ additional instruments outside of the market. Low carbon generation is a policy goal and the Government has adopted targets in relation to renewables (10% by 2010) and Combined Heat and Power (CHP) (10,000MWe by 2010). They also have policies to encourage energy efficiency. These targets and policies are then delivered through fiscal or regulatory instruments or via support programmes.

Renewable energy has had some support through the Non Fossil Fuel Obligation (NFFO). This legislation required suppliers to take a certain percentage of their demand from non fossil sources, and whilst this originally was intended to support nuclear only, the NFFO was also used to support renewable electricity from 1990 onwards to meet the then Government target of 1500MW of renewables by 2000. Although over 90% of NFFO funds went to the nuclear industry.

The NFFO awarded long term contracts through a competitive bidding process. Projects were chosen based on an analysis of ability to deliver and the unit price of the tender. The use of this fiscal instrument certainly provided a launch pad for the near market technologies of wind, landfill gas and some small hydro and the competitive process tended to drive down costs. Criticism was levelled at the way the process encouraged development at least-cost sites which were not always low impact development sites and for resulting in a cyclical development timetable that adversely affected small renewable developers (Mitchell, 1995).

The Utilities Act 2000 further reformed the regulatory framework of the gas and electricity supply companies. The reform of the trading arrangements for electricity purchase together with the splitting of supply and distribution licenses means that the previous support for renewables through the NFFO arrangements could no longer be continued. The new arrangements placed a Renewable Obligation (RO) on all suppliers to purchase 10% of their electricity from renewables by 2010. A cap on prices is included to ensure that consumers are not subject to too great a burden. Suppliers unable to meet the targets can either buy surplus Renewable Obligation Certificates (ROCs) from other parties or pay a tariff. RO is intended to deliver the UK Government target for renewables as stated in “New and Renewable Energy” (DTI, 1999). However renewable energy accounted for only 2.6% of the electricity generated in the UK in 2001 (DTI,2002a).

Combined Heat and Power (CHP) provides both heat and electricity in a single process, thus is a much more efficient way of generating. CHP has not received support through a programme such as NFFO but some support has been made available through the Enhanced Capital Allowances available from the Carbon Trust. There has been significant uptake of CHP by larger industries, with a capacity of 4,801MW in 2001 (DTI, 2002b). However the balancing of heat demand and electricity demand can reduce the competitiveness of CHP. Increasing gas prices have also impacted on CHP generation, since the gas to run the CHP was more expensive than the electricity generated. The lack of any market for low-grade heat also reduces the value of CHP since any excess heat has no value, unless used to offset in house demand for heat.

Renewables and CHP are also generally small-scale generators. Such installations generally require connection to a lower voltage part of the grid than conventional power stations. Generators of this type are known as embedded generators. The initial structure of the post privatisation electricity industry was a barrier to this kind of generation, with high costs imposed for connection. The industry and regulator have since worked out new codes for connection, but the connection process can still be a barrier in some instances. The working of the market through NETA has also disadvantaged intermittent generators, such as wind, since achieving advance contract commitments requires accurate generation forecasting over half hour periods. As a result, intermittent renewable sources have incurred costs as a result of imbalance prices, which reduced the overall value of their generation. For small-scale renewables, the impact of such cost penalties could be such that it is uneconomic to run generation plant (Bathurst and Strbac, 2001). CHP can also be disadvantaged because of the difficulty of forecasting variable heat loads.

Most suppliers have recognised that there is a market for green energy and offer some sort of green electricity product. This allows consumers to purchase renewable electricity, rather than conventional electricity. In some cases the green electricity product is used as a fund to develop further renewable (or CHP in some cases) capacity. There has been some interest from businesses (especially local authorities) and individuals, but take-up remains low (Batley et al, 2000, Batley et al 2001).

Energy supply companies have also been under some obligation to promote energy efficiency. Suppliers have been under an obligation to encourage or assist consumers to take up energy saving opportunities. This has been achieved through Energy Efficiency Standards of Performance (EESOPs), which was set by the regulator as a levy on electricity bills. Under the Utilities Act 2000, the Government, rather than the Regulator becomes responsible for

setting EESOPs, which are extended to gas as well as electricity, and are now known as the Energy Efficiency Commitment (EEC). Each supplier has an energy saving target to meet through the EEC. This can be achieved through offering energy efficient appliances such as condensing boilers and energy efficient light bulbs at a discount or by supplying insulation measures. At least half of the EEC target must be met by measures in households vulnerable to fuel poverty, i.e. households with occupants who have low income or are disabled. EEC is set at a higher level than the previous EESOP and is set to increase over the next few years.

Use of Energy

Whilst energy supply is covered almost exclusively by one Government Department, the Department of Trade and Industry (DTI), the responsibility for energy use is spread over different a number of Government Departments. The Department of Trade and Industry (DTI) responsible for energy use in business and for carbon emissions from business and the Department of Environment, Food and Agriculture (DEFRA) having responsibility for energy efficiency matters particularly fuel poverty and energy efficiency in the home. In addition to this the Department of Transport has responsibility for transport use of energy and the Office of the Deputy Prime Minister has responsibility for Building Regulations, which includes energy standards for new buildings. European policy also influences the development of UK policy.

However even where an integrated approach to policy is pursued the confinement of policy initiatives on departmental lines can restrict opportunities for “joined up” action (Barling et al 2002). Implementation of energy policy is spread across a wide variety of Government Agencies and partners. These include:

- Energy Saving Trust (EST)
- The Building Research Establishment (BRE)
- Carbon Trust
- EAGA and Warmfront
- Local Authorities
- European Union funded Energy Agencies

- Energy Efficiency Advice Centres

Each of these agencies has specific objectives and goals to meet. Their success is evaluated against their delivery of those goals, so institutional barriers may hamper an integrated approach to energy. The lack of an integrated approach has been a common criticism of UK policy (PIU 2002, RCEP, 2000, LGA 1998).

Legislation relating to a more sustainable use of energy has been rather ad hoc (McEvoy et al, 1998). Indeed much of the legislation originates outside of Government, via European statute or through Private Members Bills in the House of Commons. The current legislation can be considered separately for domestic and business energy use.

Business Use of Energy

Efficient use of energy should be a part of any businesses financial plan. Indeed for industries where there is high-energy usage there is a wealth of experience of using energy efficiently. Such companies employ energy managers who both advise on energy savings and negotiate energy contracts with suppliers. The liberalised market in energy has helped to improve business competitiveness. However with energy prices at historically low levels many small and medium sized enterprises find energy bills a small part of their overall costs, so have less incentive to use energy efficiently. To encourage businesses to make savings in their energy use the Government introduced a levy on business use of fossil fuels through the Climate Change Levy (CCL) in April 2001.

To minimise any impact on business competitiveness, this is a hypothecated tax on business use of energy with no net revenue gain for the treasury (Marshall 1998). Part of the revenue from the CCL is returned as lower national insurance payments in an attempt to move cost from social “goods” to environmental “bads” (i.e. from employment to pollution). The remainder is fund energy efficiency works for businesses and research into low carbon solutions. The Carbon Trust has been set up to administer this part of the fund.

The CCL is not a carbon tax, since it takes no account of fuel carbon content, nuclear electricity is liable to the levy. However, renewable energy and good quality CHP are exempt from the tax to provide additional incentives to their take up. Domestic users are exempt, since the Government does not wish to burden those who struggle to adequately heat their homes. Electricity is charged at a higher rate because of the poor efficiency of fuel use in electricity generation.

Fuel	Levy
Electricity	0.43 p/kWh
Coal	0.15 p/kWh
Natural gas	0.15 p/kWh
Liquefied petroleum gas	0.07 p/kWh

Table 2: Climate Change Levy

The CCL imposes a burden on UK business that may make it more difficult to compete in the global markets. The most energy intensive industries are most exposed to such competition. These industries gained a reduction in the CCL (an 80% rebate) in return for commitments to reduce greenhouse gas emissions voluntarily. Many industries with high energy demand have also joined the greenhouse gas emissions trading. Some businesses are also eligible for Enhanced Capital Allowances (ECA) to offset the cost of investing in more efficient process equipment. The CCL gives a signal to business as a way of engaging them in the move to a low carbon future (Varma, 2003).

Businesses are also able to access advice through Action Energy, a Government programme run by the Carbon Trust. This gives advice on efficient energy use in buildings and processes for many different industries. Emissions are also considered as part of the Integrated Pollution Prevention and Control (IPPC) regulations. Finally many individual types of machinery have specific standards for energy efficiency attached to them through Statutory Instrument, often following EU legislation, these are beyond the scope of this work.

Domestic Use of Energy

There has been a great reluctance on the part of Government to legislate for the efficient use of energy in the domestic sector, in spite of the fact that the domestic sector accounts for a

huge proportion of carbon dioxide emissions (McEvoy et al 1999). The Government has generally relied on a range of programmes promoting energy efficiency through guidance. The Energy Saving Trust funds Energy Efficiency Advice Centres to give advice to householders and small businesses (SMEs). Government has also funded a variety of awareness raising drives including, “*Energy Efficiency – its clever stuff*” and “*Going for Green*”. There have been grants programmes to facilitate the take up of energy efficiency measures, including cavity wall insulation and condensing boilers. However in spite of these programmes 11% of UK homes have no insulation, only 28% of homes with cavity walls have had them insulated (DTI 2002b) and only 12% of the boilers in the UK are condensing boilers (compared to 75% in the Netherlands) (DTI, 2003).

There is a published range of good practice advice for energy efficiency in all manner of buildings through their ActionEnergy programme. There have also been a number of EU programmes that have allowed local authorities, energy agencies and others to mount local campaigns. However these campaigns need to reach huge numbers to ensure that goals on emissions are met and in practice it is difficult to engage people as they have other priorities (McEvoy et al, 1999).

There are specific regulations, called Statutory Instruments (SI), that deal specifically with energy efficiency of particular appliances. SIs also include grant schemes such as the Home Energy Efficiency Scheme (HEES). HEES provided funding for energy efficiency measures and was aimed particularly at the elderly and those on benefits. In addition Building Regulations, which were recently updated, provide a minimum standard for new buildings and renovations. More specific legislation has been sparse, with two only important Acts (including amending Acts); Home Energy Conservation Act 1995 (HECA) and Warm Homes and Energy Conservation Act 2000.

HECA was introduced as a Private Members Bill following campaigning from lobbyists, led by Association for Conservation Energy. The Act focuses attention on the scope for increasing energy efficiency in housing. Local Authorities with housing responsibilities (i.e. most district/borough and unitary authorities) are designated Energy Conservation Authorities (ECA). They have a duty to prepare and publish reports that identify practical and cost effective measures, which are likely to result in significant improvements in energy efficiency in the residential properties in their area. These reports are sent annually to the Secretary of State.

Energy conservation measures include information, advice, education, and promotion, making grants and carrying out work. The Home Energy Conservation Act encourages the ECAs to

carry out the measures identified, but there is no statutory duty to do so. Although additional funding was allocated towards the cost of preparing reports there was no specific funding to take forward the measures identified. Limited funding was identified through existing programmes such as the Housing Improvement Programme (HIP) and HEES. Subsequently additional funding has been made available through bidding for specific projects, facilitated by the Energy Saving Trust through the HECAAction programme.

The Warm Homes and Energy Conservation Act, formally recognises fuel poverty as a major issue for public well-being. The Act requires the Secretary of State for England and the National Assembly for Wales

'to publish and implement a strategy for reducing fuel poverty and set targets for its implementation'.

This strategy (DEFRA 2001) seeks to provide an integrated approach to fuel poverty within the wider issues of sustainable development and builds on "*A better quality of life – A strategy for sustainable development for the UK*" (DETR, 1999a). The Government aims to eradicate fuel poverty in vulnerable households by 2010. The Government aim is to ensure that prices remain low, thus reducing the burden on those who struggle to heat their homes. Thus low prices together with improved economic conditions and increased benefits should remove most people from fuel poverty. However this policy leaves those in hard to heat homes (50% of those in fuel poverty live in properties with a SAP rating of less than 50) vulnerable to possible future rises in energy prices caused by international events, such as war. In addition it does not address the wider concern of poor housing conditions. Some specific targets for improving the energy efficiency of building are identified and existing Government grants programmes are expected to play a role in delivering the targets of the fuel poverty strategy. HEES has been extended in partnership with utilities and launched under the Warmfront banner. This is aimed at improving the energy efficiency of homes and in certain circumstances replacing heating systems.

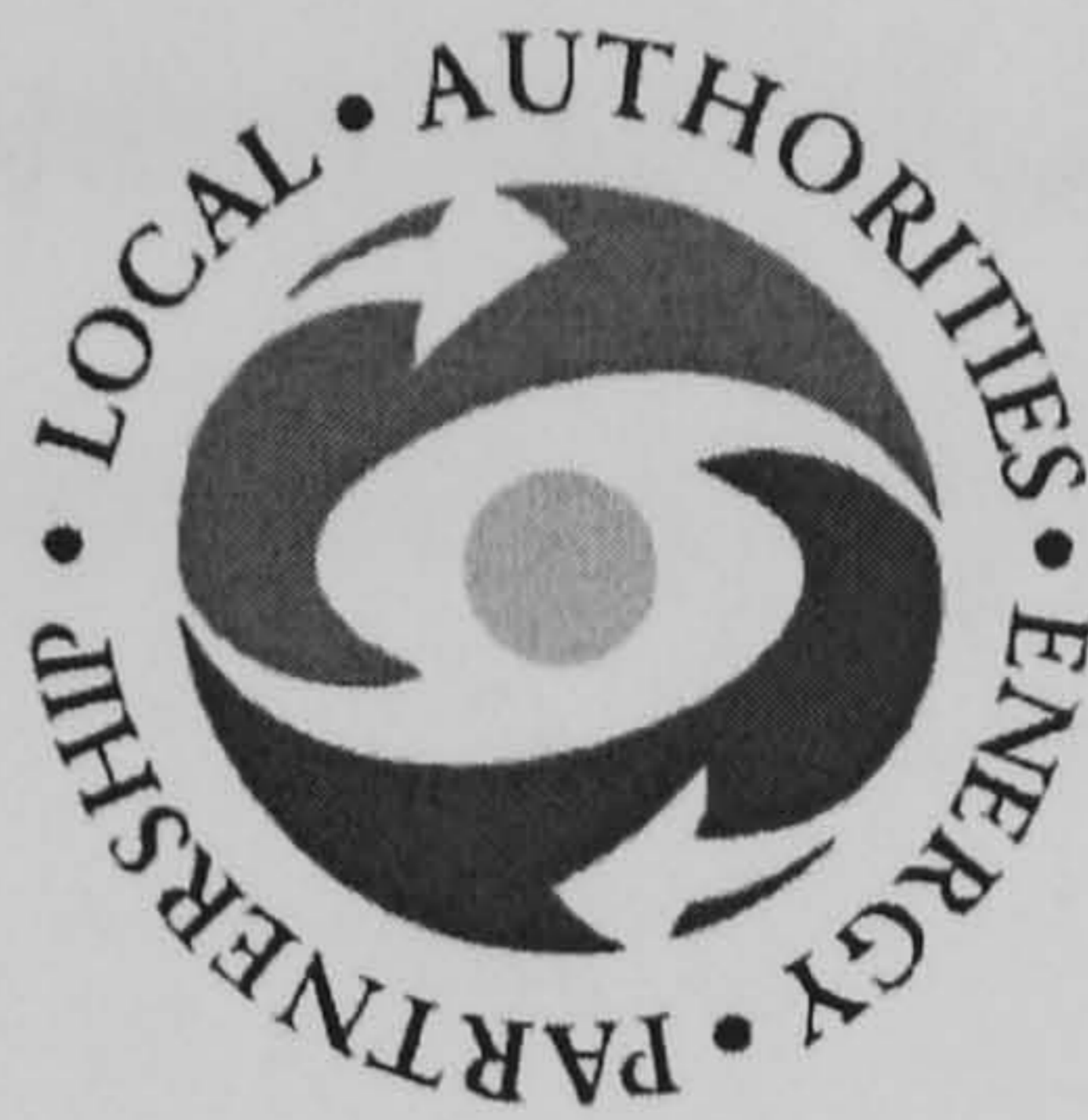
It would seem sensible that HECA and the Warm Homes bill should complement each other and integrate. However the links between HECA and Warm Homes are not well established and the two Acts do not provide a framework for an integrated approach. Implementation is carried out by different agencies, with local authorities responsible for HECA and NGOs such as EAGA responsible for grants and advice under the Warm Homes Act. In addition as the focus is mainly on those in fuel poverty neither Act provides a comprehensive approach to efficient use of energy in the home. Those who can afford to adequately heat their home are unlikely to be engaged in reducing their carbon emissions through efficiency measures. The

carbon savings from the fuel poor are likely to be small as any savings are taken as extra comfort.

Lobby groups such as the Association for the Conservation of Energy continue to press for improvements to domestic energy policy. There have been a number of Private Members Bills to improve the aspects of energy policy, the latest is the Sustainable Energy Bill. In particular there has been some effort given to make the targets under HECA a statutory duty (and provide suitable funding) and to adopt a target for energy efficiency improvements. To date none of these bills has managed to find sufficient support or Parliamentary time to reach the statute books, but there is hope that the latest Bill will progress.

Appendix B

Model Supplementary Planning Guidance



PLANNING FOR MORE RENEWABLE ENERGY SEMINAR

Development Plan

'Model' Supplementary Planning Guidance

Encouraging Sustainable Energy Use

WORKSHOP 1

Supplementary Planning Guidance

Encouraging Sustainable Energy Use

Contents

1. The Purpose and Status of this Document

2. Sustainable Energy

- 2.1 National Government Position
- 2.2 Local Government Position

3. Policy Context

- 3.1 International
- 3.2 National
- 3.3 Regional

4. Sustainable Energy and Site Layout

- 4.1 Reducing Demand
- 4.2 Improving Energy Efficiency
- 4.3 Renewable Energy
- 4.4 Clean Use of Energy

5. Sustainable Energy in Buildings

- 5.1 Reducing Demand
- 5.2 Improving Energy Efficiency
- 5.3 Renewable Energy
- 5.4 Clean Use of Energy

6. Energy Generating Installations

Further Information and Advice

- Useful Addresses
- Bibliography
- Appendices

1. The Purpose and Status of this Document

This Supplementary Planning Guidance statement is intended to elaborate on development plan policies and proposals. It thus reduces the level of detail required in the development plan. It endeavours to give general advice and guidance on sustainable energy provision, including renewable energy, in developments for all parties with an interest in constructing, converting or refurbishing property within the Council's boundary.

The aim of the guidance is to bring about reductions in greenhouse gas emissions. It has been prepared in accordance with advice set out in PPG22 and Draft PPG12, and adopted by the Council as supplementing the following planning policies:

INSERT RELEVANT POLICIES:

The text of this Guidance can be treated as a material consideration when determining planning applications within the county/district. It also reflects advice set out in DETR's "*Planning for Sustainable Development – Towards Better Practice*" (DETR Oct 1998) and the Final Report of the "*East Midlands Renewable Energy Planning Study*" (ETSU March 1998).

Discussion Points

- How useful is the supplementary status of a policy document in making development control decisions?
- How much weight can local authorities give to SPG when negotiating with developers, especially where there may be differences between global and local considerations?

2. Sustainable Energy

2.1 National Government Position

The concept of sustainable development has helped shape many UK Government policies of the 1990s. The latest strategy document "*Sustainable Development – A better Quality of Life*" (DETR May 99) features the following aims:

- Social progress which recognises the needs of everyone
- Effective protection of the environment
- Prudent use of natural resources
- Maintenance of high and stable levels of economic growth

The Government is committed to advancing sustainability through the planning system and has recently published *“Planning for Sustainable Development – Towards Better Practice”* (DETR Oct 1998).

Most policy documents now plot the threats to health and climate posed by increasing greenhouse gas emissions. The Government’s recent consultation paper on *“Climate Change (DETR 1998)”* recognised that fossil fuel derived power for heating, electricity and travel forms the major contribution to such emissions. A policy concentration on using energy as efficiently as possible and on developing renewables wherever opportunities present themselves is thus viewed as fully merited on environmental grounds. Additionally, sustainable energy also impacts upon key areas of social policy (notably health in relation to affordable heating, housing condition and air quality) and offers economic opportunities (e.g. employment in new technology manufacturing and rural diversification).

2.2 Local Government Position

The preferred role for local government in pursuing sustainable energy strategies is set out in the Local Government Association’s (LGA) position statement *“Energy Services for Sustainable Communities – The Local Government Position”* (LGA Feb 1998). It recognises that energy is central to all strands of sustainable development and would benefit from a coherent national strategy if greenhouse gas reduction targets are to be met. It recommends that policies, practices and proposals should be assessed against the following energy hierarchy (with preference for the early options):

- Reduce the need for energy
- Use energy more efficiently
- Use renewable energy
- Any continuing use of fossil fuels to be clean and efficient for heating and co-generation.

Discussion Points

- Could an energy hierarchy, analogous to the waste hierarchy, be incorporated into planning practice and successfully implemented?
- How are sustainability objectives addressed by local planning authorities and how much does the commitment to renewables as part of the solution vary according to experience?

3. Policy Context

3.1 International

The prospect of global climate change, due to the heating of the earth’s atmosphere by greenhouse gases, is probably the most convincing reason for pursuing sustainable development. The need to take action to curb greenhouse

gas emissions has been recognised by international commitments made at the Rio De Janeiro Earth Summit of 1992 and at the Kyoto conference in 1997. The Kyoto Protocol set legally binding emission reduction targets for developed countries, with the UK accepting a 12.5% target below 1990 levels by the period 2008-2012.

The European Union White Paper on Renewable Energy (1997) confirms the potential of renewable technologies to supplement/replace fossil fuel derived energy given improving market conditions. It highlights the relative shortfall of schemes in the UK and the benefits for remoter areas. In 1999 it was translated into a co-ordinated Action Plan entitled "Campaign for Takeoff" which made financial and regulatory support available.

3.2 National

Throughout the 1990s it has been the UK Government policy to stimulate the use of renewable resources wherever it is economically and environmentally acceptable to do so. The planning policy framework has been contained in PPG12 (Development Plans and Regional Planning Guidance) and PPG22 (Renewable Energy), the latter identifying the main technologies and the principal planning issues associated with them. The target of 1500 mega-watts (MW) of generation by 2000 originally set by the 'Prospects for Coal' White Paper of 1993, was increased by the incoming Government of 1997. The New and Renewable Energy Review of May 1999 confirmed this domestic target, 10% of electricity generated from renewables by 2010, as generally feasible.

To date the main instrument for securing electricity capacity from renewables has been the Non-Fossil Fuel Obligation (NFFO). Since 1990 its subsidy has enabled some 650MW to be commissioned in the UK. In this way technologies approaching viability - such as landfill gas, small hydro, energy from waste and windpower schemes - have gained entry to the electricity market.

3.3 Regional

The 1994 Regional Planning Guidance for the East Midlands (RPG8) which gives general support to renewables (qualified by environmental considerations) is under review as at August 1999. The post-consultation draft recognises the need to improve energy efficiency and to increase the level of commissioning of renewable schemes.

It proposes that the region adopts the initial target of 400MW of capacity by 2005 from grid connected renewable installations and supports local initiatives to promote self sufficiency. This target is derived from ETSU's East Midlands Renewable Energy Planning Study (1998) which breaks down the potential resource by county areas. Appendix 1 indicates the scale of the resource for each major technology and is desegregated into figures for Nottinghamshire and Derbyshire. The table highlights the considerable potential offered by wider use of energy from solar technologies, particularly through passive solar design and

photovoltaic cells. Clearly the realisation of this potential will be crucial in meeting the Government's 2010 and future targets. The Study also recommends the adoption of model policies (see Ch 18) and the preparation of Supplementary Planning Guidance.

Discussion Points

- Can national and regional targets for introducing energy-generating renewable technologies be successfully converted into schemes at local level?
- Is there a case for pursuing energy efficiency improvements in new buildings before seeking to accommodate new and renewable technologies which normally have more complex planning consequences?

4. Sustainable Energy and Site Layout

4.1 Reducing Demand

Energy demands can be greatly reduced or increased by the layout of the site. Dwelling related energy demands can be reduced by up to 10% by careful siting and improvements to microclimate. Careful site layout can also reduce the energy consumed by travel, by improving the access by foot and cycle, and lead to improvements in the general site image and in reducing crime. PPG1 highlights the need for good design in new developments. *"Sustainable Settlements -A Guide for planners, designers and developers"* (LGMB 1995), gives much detailed information on design for sustainability, including 'energy friendly' layouts.

The best opportunities for energy saving, and a good building environment generally, occur if the development is designed to use the topography and features of the site and allow for good solar access, General Information Report 27 from BRECSU gives information on passive solar estate layout. The following elements should be considered but must be balanced with other important issues in urban design, e.g. privacy, open space and communal space,

- Access and Layout – minimising unnecessary journeys, improving accessibility for pedestrians and cyclists. If possible main residential roads should run East- West to improve solar orientation of buildings
- Orientation – where possible the long face of buildings should be orientated to be within 30° of south.
- Overshadowing – trees and other buildings should be far enough away to allow full solar access, thus allowing maximum amounts of daylight to reach the building. Deciduous trees will allow light to penetrate in winter, whilst providing welcome shade in summer, thus reducing overheating. Overshadowing caused by a sloping site should be allowed for with greater spacing, or the use of staggered building heights.

- Microclimate - local site microclimate can be improved by hedges, trees and fencing. These features can provide shelter from wind and rain, which is important for comfort in the open spaces. In addition buildings can be protected, reducing heat loss. Care must be taken to preserve the solar access (i.e. overshadowing).

4.2 Improving Energy Efficiency

New buildings should as far as possible use materials that are energy efficient. This includes considering the energy expended in transporting materials to site. Local supplies should be given priority as far as is practical, and use of local resources should be planned in at the design phase. The energy consumed in making the various building materials should also be taken into account as the embedded energy of the development. BRECSU can give advice on the environmental auditing of a site using tools such as BREEAM (see page 9). There may in time be a case for certain types of development proposals to be accompanied by an Energy Utilisation Statement in the same way that Environmental Statements are required under the Assessment Regulations (see section 6).

4.3 Renewable Energy

The potential for renewable energy should be identified and explored at an early stage of the development process. The East Midlands Renewable Energy Planning Study (ETSU 1998) provides information on various renewable resources at county level. This initial information will probably need to be supplemented by further site specific assessment. For example:

- exposed ridges - development of wind power
- derelict water mill - conversion for hydro-power?
- south facing slopes - passive solar house design
- crop growing - biomass power plant in vicinity?

Much of the site assessment analysis can contribute to the preparation of an Environmental Statement at the required stage.

4.4 Clean Use of Energy

In new developments Combined Heat and Power (CHP) coupled to district heating networks may offer opportunities for efficient energy usage. CHP units generate the power for the buildings, but rather than exhausting the waste heat it is converted for use in space and water heating, thus improving overall efficiency. The provision of district heating networks at the beginning of a new project could reduce costs and significantly reduce greenhouse gas emissions.

Refurbishment may also allow opportunities for the use of CHP. CHP plant could be housed in the development and the heat sold if heat loads are available nearby. Heat from industrial or commercial processes could also be used in a district heating system if on site CHP is not possible. The identification of potential buyers of excess heat is important at an early stage.

The Council would welcome the provision of district heating infrastructure in new and refurbished developments, even if no CHP system is planned. Careful thought must be given to the control of heating systems within the buildings. Badly controlled systems are not well accepted by users. However much good practice guidance has now been developed and is available from BRECSU and ETSU.

CHP can also be applicable when using farm or forestry waste (e.g. coppiced wood), as is proposed at Sherwood Energy Village (Notts) in GIR53 (ETSU).

Discussion Points

- Layout design is a traditional concern for Development Control. How straightforward would it be to include energy concerns? What further information would be useful?
- Good solar access implies building densities of perhaps 25–35 dwellings per hectare depending upon latitude. How does this tie in with policies requiring higher building densities?
- Can district heating networks be negotiated using a Section 106 agreement?
- How far will developers be willing to embrace energy saving/self sufficient generation in negotiations on new development?

5. Sustainable Energy in Buildings

5.1 Reducing Demand

Buildings are responsible for a large percentage of the total greenhouse gas emissions. Various recent studies, including one on behalf of the DETR in Newark and Sherwood have highlighted the opportunities to build houses that consume little or no energy for heating at little extra construction cost (DETR Best Practice Programme General Information Report 53 available from BRECSU). New technologies and sound design principles can allow for large energy savings for example:

- Passive Solar Design (PSD) - designs which maximise the solar gain can save up to 10% on space heating requirements. Conservatories and sun-spaces are a prime example of this. Care must be taken to ensure that conservatories are isolated from the main house and unheated, else they act as a net loss of energy. Schools and public building may be particularly suitable for PSD. Information is available in “Planning for Passive Solar Design” (available in delegate pack)
- Massive Insulation - can reduce heating requirements to zero
- Highly insulated glazing - triple glazing or double glazing with low emissivity coatings can reduce heat losses through windows
- Earth Sheltering - reduces the range of temperature variation, reducing heating and cooling requirements.

- Terraced housing requires less energy than semi-detached and detached housing to heat.
- Entrances can be carefully designed to reduce the loss of heat if doors are often accessed.
- Stairways and corridors can be designed to act as buffer spaces to reduce the heating needs in adjacent offices and shops.

Commercial and retail buildings often have more potential for innovative design than residential properties. In addition to the above design issues the following could be considered:

- Buildings can also be designed to naturally ventilate. The use of atria in buildings produces a natural stack effect, warm air rises and drives natural ventilation, reducing the need for expensive air conditioning systems.
- Atria can also be glazed adding to the natural daylight penetration. This can produce a very pleasant environment, which is valued by those working in the building and by those who visit, perhaps to shop.

Non residential buildings cover a wide spectrum of different uses and have a similarly wide spectrum of opportunities for saving energy. These buildings would benefit from an energy assessment early in the development process. Various consultants could provide this sort of report, which would be of value if submitted with planning applications. One method is BREEAM, the Building Research Establishment Environmental Assessment Method. This provides guidance on ways of minimising the adverse effects of buildings on the environment, both locally and globally. Energy is one of the categories assessed. Further information is available from the Building Research Establishment. The Council would find this information valuable when judging a planning application.

Refurbishment and conversion of old buildings may also offer many opportunities for improving the energy use with buildings. Internal wall insulation is readily available. Additional floor and roof insulation is possible, particularly if a roof is being replaced. Similarly new glazed units can be to a higher standard. Innovative use of glazed courtyards can reduce the energy requirement of a building, but also enhance the whole building appearance. Porches and sun areas (e.g. glazed balconies) can also be included. The cost of these extra features need not be high if significant changes to the building are already taking place.

5.2 Improving Energy Efficiency

Houses should as far as possible use the most energy efficient appliances in the price range. In particular thought should be given to installing condensing boilers in domestic properties. Heating and power requirements should be studied to optimise the choices of appliance.

The provision of energy efficient appliances can significantly reduce the energy demands of commercial and industrial buildings.

- Energy efficient lights can save money in both running costs and maintenance.
- Energy efficient boilers for heating and hot water demands can also reduce costs.
- For larger buildings a Building Energy Management System (BEMS) can be useful particularly if it is well monitored by knowledgeable personnel. General Information Report 12 discusses energy management and there are a variety of good practice guides on energy management available from BRECSU.
- New and innovative energy efficient appliances offer higher levels of saving. In addition electrical equipment often offers the opportunity to operate in an energy saving mode.
- If artificial ventilation is required in a building an energy efficient system should be used.

Many people have the use of non-domestic buildings such as factories, offices and shops. However on occasion no one has responsibility for saving or reducing energy demand. Often energy costs are low and do not warrant special treatment. Encouraging staff to be responsible for energy efficiency and the use of energy is an effective way of improving energy savings. The BRE Energy Efficiency Best Practice Programme has produced various guides on the use of energy within all sectors. This allows individual businesses to measure their performance and highlight areas where improvements can be made cost effectively. Contact details are included at the end of this guidance.

5.3 Renewable Energy

Energy generation within buildings is not often considered however there are still opportunities for renewable energy. In particular, solar energy, even at these high latitudes can provide significant savings.

- Use of passive solar design has been highlighted above (Section 5.1).
- Solar Water heating can offset up to 50% of domestic hot water requirements. Best performance is in the summer when other heating needs are at a minimum, so boilers do not have to be operated inefficiently, at low load. Solar water heaters are easily installed, but are more expensive than traditional heating systems as they do need to be operated in conjunction with a traditional water heating. They are particularly suitable for new houses or conversions and refurbishments, where roofing work is taking place. They are also a good choice for heating swimming pools during the summer. They can also be used in non domestic building which have a high hot water requirement.
- Solar air heating and ventilation systems are also now available. BRECSU and ETSU have details.
- Photovoltaic cells, which generate electricity from the sun are easily integrated on a building roof or facade. The technology is still expensive, but the bulk buying capabilities of developers could soon drive the price down as a market becomes established. The cost is however comparable with other

prestige materials such as marble. PV generate when the sun is shining, so domestic properties would either need battery supplies or more efficiently to be grid connected to import electricity during the night and export excess electricity during the day. Grid connection is handled by the local Electricity Company, who should be consulted with at an early stage. Some of the issues relating to grid connection of many small generators are still not fully resolved, but ETSU should be able to give advice.

There may be issues of visual impact, but outside of conservation areas these should not be significant.

- Energy efficient wood burning fires are an easy option for renewable energy that is often overlooked. However a source of sustainable fuel nearby would need to be identified if this was to be an option on a large scale. This may be an option for small schools as well as houses, but may not be allowed in smokeless zones.
- In industrial buildings specific processes may produce organic waste which may be anaerobically digested to produce gas. Other forms of waste may be incinerated and electricity and heat produced using a Combined Heat and Power plant, this would be especially suitable for hospitals.
- Wind power may be appropriate at sites with large open spaces for example some industrial or leisure sites.
- Local sites for hydro power may be available (e.g. old water mills).

In general the council will support all applications of renewable technologies, where appropriate. The provision of an environmental impact assessment would be useful in assessing the proposals.

5.4 Clean Use of Energy

Combined heat and power (CHP) units are well suited to large buildings, such as offices, shopping precincts and factories. Heat loads are available on or close to the site, which considerably improves the viability of CHP. The technology is well proven, and the size of plant is reducing all the time, which makes it more viable for a range of different schemes. CHP schemes generally run on gas or diesel fuel, but are more efficient than a boiler or generator alone.

CHP schemes may also be used in refurbished buildings where the heat produced may be sold or sent to neighbouring buildings to their reduce heating demand. Refurbished buildings can also draw on heat from neighbouring CHP schemes. City centre developments may particularly lend themselves to sharing heat and or electricity, as the costs of infrastructure will be lower. Public buildings such as schools and colleges may be good candidates for CHP, particularly if the extra heat could be delivered to nearby houses.

CHP schemes may also be converted to run on non fossil fuels such as biofuels if they should become commercially viable.

Discussion Points

- Is there a mechanism by which building control and development control officers can liaise in order to influence the specification for energy in buildings?
- Does CHP merit more extensive coverage and training?
- How easily can renewables be accommodated on and around mobile buildings?

6. Energy Generating Installations

Renewable energy differs from traditional energy generation in a number of respects:

- it usually needs to be where the resource occurs e.g. wind generator at windy site, hydro at a river;
- it often demands a rural site;
- it operates at a smaller scale than fossil fuel generation but can be more easily dismantled.

These 'exceptional' site requirements have in some areas led to conflict with other land (or river) users given that the open countryside is generally protected from development. However the implementation of a renewable energy plant should not necessarily create a precedent for future 'exceptional' developments.

Renewable energy developments will need easy access to the electricity grid, but not necessarily the highest voltage parts of the grid. They will generally be sited near to an existing substation, which may need to be upgraded. Electric cables to the sub-station will also be required.

With the exception of biomass and energy from waste plants, renewable energy generation plants tend to be:

- unmanned, with few journeys to site outside of construction time;
- easily decommissioned;
- free of noise and emissions.

Biomass and energy from waste do require a constant supply of fuel in the form of waste materials being brought in on a daily basis and will thus have large numbers of traffic movements associated with them. They may also cause some emissions: however all plants must meet Integrated Pollution Control (IPC) regulations, so that any emissions should be very low. All installations should be considered carefully in line with guidance given in PPG 22 (Renewable Energy)

It is likely that some renewable energy installations will be sufficiently significant to require an Environmental Impact Assessment (EIA), in accordance with DETR circular 02/99 and the Town and Country Planning (Assessment of Environmental Effects) Regulations 1994. A detailed explanation of planning procedures and of

the steps to be taken in preparing an Environmental Statement is set out in *ETSU's 'Planning and Environmental Assessment Guide (1997)*.

The requirement that plant are completely dismantled and removed from site will be a condition of any planning permission. The cumulative impact of the development will need to be considered in areas where a number of energy installations are proposed in relative proximity.

Renewable energy plants produce smaller amounts of electricity than conventional plants, but this contribution should not be considered worthless. Renewable energy generally releases no new carbon dioxide and energy from waste plants reduce the amounts of methane, a far more damaging greenhouse gas, released into the atmosphere. Renewables are locally produced so less energy is lost in transmission. They improve the diversity and security of supply. Their benefit to global sustainability is very high, however there are local environmental impacts. In general the environmental impacts of a renewable installation are significantly less than a conventional power station, but as they are generally sited in a rural area the local impacts may seem high. Appendix 2 highlights the main impacts.

In addition to commercial generating installations there are many opportunities for the use of renewables as small or stand alone facilities, for example:

- energy for a farm produced by a small wind generator or biomass plant,
- energy for telecommunications provided by stand alone photovoltaics.

Renewable energy is very well suited to this type of small-scale application. Farms and remote dwellings that are off the electricity grid may find renewable energy a good alternative. For grid connected properties renewables may still offer a reasonable offset on energy costs. There is also the possibility of exporting electricity to the grid or to neighbouring users.

Discussion Points

- It is accepted that visual impact is a key objection to many forms of renewables, but how can this variable be judged objectively against any other benefits?
- Do small-scale installations on farms and in remote areas merit different criteria to those installations in urban settings (e.g. on energy parks) or larger scale power stations in open countryside?

Further Information and Advice

BRECSU

Building Research Establishment
Garston, Watford WD2 7JR

Tel 01923 66458

ETSU

Harwell
Oxfordshire OX11 0RA

Tel 01235 436747

Useful References

1. "Sustainable Development - A Better Quality of Life" DETR 1998
2. "Climate Change Consultation" DETR 1998
3. "New and Renewable Energy: Prospects for the 21st Century" DTi 1999
4. "Planning for Sustainable Development - Towards Better Practice" DETR 1998
5. "Sustainable Settlements - A Guide for Planners, Designers and Developers" LGMB/University of West of England 1995
6. "Energy Planning: A Guide for Practitioners" RTPi
7. "Planning for Passive Solar Design" BRECSU for Dti 1999
8. "Energy Services for Sustainable Communities" LGA 1998
9. "East Midlands Renewable Energy Planning Study" ETSU 1998
10. "Planning for Photovoltaics" ETSU for DETR

Appendix C

Planning Officers Questionnaire Survey

Issued June 1999

Sustainability in planning and development of new buildings

Instructions

Please answer all the following questions relating to sustainable development. Follow the instructions on each question. All answers will be treated as strictly confidential and will only be used for the purposes of research. The information given will help to assess the need for and the form of tools to aid local authority staff in assessing and implementing a more sustainable approach to local development. None of the responses will be made available to any other organisations. Once the questionnaire is complete please return to :

Helen Chadwick, Institute of Energy and Sustainable Development, De Montfort University,
Leicester LE1 9BH. Tel 0116 2606424 : email hmc@dmu.ac.uk

Thank you for your time and assistance. If you have any queries contact me on the number above.

Section 1 : Your Position

1. Which department do you work for ?
2. Please give a brief description of your duties.
.....
3. Is the area covered by your authority
mainly urban *mainly rural*
4. How many new build projects would you expect to be involved in on average per year?
none *1-10* *11-50* *51-100* *more than 100*

Section 2 : Sustainable development and your job

5. Would additional information on any of the following be useful in **your job**?

	Not for my job	No	Maybe	Yes
<i>Development of brown field sites</i>				
<i>Encouraging Biodiversity</i>				
<i>Pollution Control</i>				
<i>Encouraging Design which reduces crime</i>				
<i>Use of renewable energy</i>				
<i>Combating social exclusion</i>				
<i>Water conservation</i>				
<i>Encouraging design which promotes health</i>				
<i>Reducing traffic and promoting transport choice</i>				
<i>Improving the quality of the built environment</i>				
<i>Better waste management</i>				
<i>Improving energy efficiency</i>				

6. What is the most useful means of acquiring information (tick all that apply)

- | | | |
|---|--|--|
| <i>Via Local Government Networks</i> <input type="checkbox"/> | <i>Guidance notes</i> <input type="checkbox"/> | <i>Seminars</i> <input type="checkbox"/> |
| <i>Continuing Professional Development</i> <input type="checkbox"/> | <i>Training Material</i> <input type="checkbox"/> | <i>Case Studies</i> <input type="checkbox"/> |
| <i>Specific case consultancy</i> <input type="checkbox"/> | <i>Notes for developers</i> <input type="checkbox"/> | <i>Degree/MSc.</i> <input type="checkbox"/> |
| <i>Other</i> <input type="checkbox"/> (Please Specify) | | |

7. What format would best suit your needs?

- Printed Material* *Computer Based /CD Rom* *World Wide Web access*

8. For any training would you prefer to

- Remain on site* *Go to another location* *Access in own time*

Section 3 : Local Agenda 21

9. Are you aware of the local Agenda 21 process?

Yes No

If NO please go to question 12

10. How clear are you on the meaning and purpose of Local Agenda 21?

Very clear Fairly clear Neither clear Fairly unclear Unclear
nor unclear

11. How important, do you feel, is the Local Agenda 21 process?

Very important Fairly important Neither important Fairly unimportant Unimportant
nor unimportant

12. How strongly do **you** agree or disagree with the following statements?

(Where 1 is agree strongly and 5 is disagree strongly and 3 is neither agree nor disagree)

	1	2	3	4	5
<i>Emphasis on environmental concerns will damage the economy</i>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<i>Economic and environmental concerns can be balanced sensibly</i>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<i>Environmental problems are exaggerated</i>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<i>A change of attitude to all aspects of development is necessary</i>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<i>If there is no change future generations will suffer</i>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<i>Science will solve all environmental problems</i>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Section 4 : Sustainable development

13. Choose the **Three** issues **you personally** consider most important when planning new development.

<i>Minimising loss of open land</i>	<input type="checkbox"/>
<i>The quality of the built environment</i>	<input type="checkbox"/>
<i>Minimising pollution</i>	<input type="checkbox"/>
<i>Improving waste management</i>	<input type="checkbox"/>
<i>Reducing social exclusion</i>	<input type="checkbox"/>
<i>Encouraging use of renewable energy</i>	<input type="checkbox"/>
<i>Increasing the vibrancy of the local economy</i>	<input type="checkbox"/>
<i>Reducing car journey length and number</i>	<input type="checkbox"/>
<i>Encouraging energy efficiency</i>	<input type="checkbox"/>
<i>Promoting conservation of water resources</i>	<input type="checkbox"/>
<i>Improving quality of life via health and education</i>	<input type="checkbox"/>
<i>Protection from crime and fear of crime</i>	<input type="checkbox"/>
<i>Improving biodiversity</i>	<input type="checkbox"/>

14. What in your **opinion** is the biggest obstacle to including sustainability in new projects?

15. Do you use any information from external sources for planning guidance? (For example BRE, RSPB, Friends of the Earth etc..)

Yes No

If yes please give details.

Section 4 : Sustainable development cont'd

16. Has your department handled projects which included any of the following, during the past year?

	none	1 - 10	11 - 50	51-100	more than 100	Don't Know
<i>Building on brown field sites</i>						
<i>Measures for improving biodiversity</i>						
<i>Specific action on pollution</i>						
<i>Measures to reduce crime</i>						
<i>Renewable energy</i>						
<i>Measures to combat social exclusion</i>						
<i>Measures to encourage water conservation</i>						
<i>Measures to promote health</i>						
<i>Energy Efficiency</i>						
<i>Reducing traffic and improve transport choice</i>						
<i>Measures to improve waste management</i>						
<i>Improving the quality of the built environment</i>						

If so was the planning process straight forward? Please comment on your experiences
(continue on a separate sheet if necessary)

Section 5 : Energy Efficiency and Renewable Energy

17. Does your authority have an official energy policy

Yes No Don't Know

18. Does your authority request an energy efficiency rating greater than specified in Building Regulations Part L?

Yes No Don't Know

if you answered yes, what level is requested?

19. Has that level increased in the last 12 months?

Yes No Don't Know

20. Do you include any other specific energy efficiency requirements?

Yes No Don't Know

if you answered yes, please specify.

21. How do **you** feel that your authority are performing in energy efficiency measures?

Very well well average poorly very poorly

Section 5 : Energy Efficiency and Renewable Energy cont'd

22. To your knowledge which of the following renewable energy technologies are installed in your area?
(Please tick all that apply)

<i>Wind Turbines</i>	<input type="checkbox"/>
<i>Passive solar design</i>	<input type="checkbox"/>
<i>Small scale hydro-power</i>	<input type="checkbox"/>
<i>Solar electricity</i>	<input type="checkbox"/>
<i>Waste incineration</i>	<input type="checkbox"/>
<i>Biomass</i>	<input type="checkbox"/>
<i>Solar heating</i>	<input type="checkbox"/>
<i>Landfill Gas</i>	<input type="checkbox"/>
<i>Combined Heat and Power</i>	<input type="checkbox"/>
<i>Don't Know</i>	<input type="checkbox"/>

23. Please state how strongly you agree or disagree with the following statements.
(where 1 is agree strongly, 5 is disagree strongly and 3 is neither agree nor disagree)

	1	2	3	4	5
<i>Renewable energy is too expensive to generate at present</i>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<i>There are many opportunities for renewables in my area</i>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<i>Renewable energy technologies are unreliable</i>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<i>Most people in my area would welcome more renewable energy</i>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<i>More of our energy should come from renewable sources</i>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<i>Government action will be needed to increase the uptake of renewables</i>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<i>Local people are not familiar with renewable energy</i>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<i>Local authorities need to take the lead in encouraging renewables</i>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

24. In **your opinion** how would the following types of renewable energy be received in your area?
(where 1 is very favourably, 5 is very unfavourably and 3 is neither favourably nor unfavourably)

	1	2	3	4	5	n/a
<i>Large Scale wind (i.e. wind farm)</i>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<i>Small scale wind (i.e. 1 or 2 turbines)</i>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<i>Biomass</i>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<i>Passive Solar Design</i>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<i>Waste incineration</i>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<i>Solar Electricity</i>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<i>Small scale hydro-power</i>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<i>Solar heating</i>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<i>Landfill gas</i>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<i>Combined Heat and Power</i>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Helen Chadwick,
Institute of Energy and Sustainable Development,
De Montfort University,
The Gateway,
Leicester LE1 9BH

Please return in envelope supplied

Thank you for taking the time to fill out this questionnaire, if you would be willing to take part in a follow up interview please state your name and a contact address and phone number.

.....
.....
.....

Appendix D

List of Publications Arising from this Work

List of Publications Arising from this Work

Chadwick H.M. and Fleming, P. (2001) Home Energy Conservation Act (HECA) - The next five years. HECA Conference, York.

Chadwick H.M., P. Devine-Wright and P. Fleming (2001) The use of sustainability appraisal in strategic spatial planning. A case study of the East Midlands Regional Planning Process. SUSPLAN 2001, Newcastle

Chadwick, H.M., Batley-White, S.L., Fleming, P.D. (2002). The UK planning process and the electricity supply industry-what role for renewables?. 5th Symposium of the International Urban Planning and Environment Association, "Creating Sustainable Urban Environments: Future Forms for City Living", Christ Church, Oxford, 23-26th September 2002.

Fleming, P.D; Webber, P; Chadwick, H. & Devine-Wright, P. (2001) Greenhouse gas inventory. In S. Shackley; J. Kersey; R. Wilby & P. Fleming (Eds.) Changing by Degrees: The potential impacts of climate change in the East Midlands. Ashgate Studies in Environmental Policy and Practice.

Devine-Wright, P. Fleming, P.D. & Chadwick, H. (2001) The Role of Regional Social Capital in advancing Sustainability. *Impact Assessment and Project Appraisal*, 19(2), 161-167.

Leicester City Council (2002). Supplementary Planning Guidance: Energy Efficiency and Renewable Energy in New Developments. Leicester, Leicester City Council.