

Low carbon spaces: area-based carbon emission reduction - a scoping study

02.06.02



Sustainable
Development Commission

Low Carbon Spaces

Area-Based Carbon Emission Reduction: A Scoping Study

Prepared for the Sustainable Development
Commission by the Tyndall Centre for Climate
Change Research

March 2002

Simon Shackley¹, Paul Fleming² and Harriet Bulkeley³

With: Sarah Mander¹, Ken Green¹, John Turnpenny⁴, Abigail Bristow⁵
Darryn McEvoy⁶, Dorian Speakman¹ and Sebastian Carney¹

- 1) Tyndall Centre at UMIST
- 2) Institute of Energy & Sustainable Development, De Montfort University
- 3) St.Catherine's College, University of Cambridge
- 4) Tyndall Centre at UEA
- 5) Tyndall Centre & Institute of Transport Studies, University of Leeds
- 6) Centre for Urban and Regional Ecology, University of Manchester

Contents:

Glossary of Acronyms

Summary

1. Introduction

2. Overview

3. Local Government Experiences

4. Exemplars of Low-Carbon Sustainable Energy

5. Experience in Other Countries

6. Consultees

7. References

Appendix One: The Players

Appendix Two: Recommendations

Appendix Three: A Note on the Transport Sector

Appendix Three: The Data Base

Glossary of Acronyms

BRE	Building Research Establishment
CAT	Centre for Alternative Technology
CHP	Combined Heat and Power
CCL	Climate change levy
CCP	Councils for Climate Protection
CO ₂	Carbon dioxide
CT	Carbon Trust
DEFRA	Department of Environment, Food and Rural Affairs
DTI	Department of Trade & Industry
DTLR	Department of Transport, Local Government and the Regions
EEC	Energy Efficiency Commitment
EESoP	Energy Efficiency Standards of Performance Programme
EEACs	Energy Efficiency Advisory Centres
ESCO	Energy Services Company
EST	Energy Saving Trust
GDP	Gross Domestic Product
GHG	Greenhouse gas
HECA	Home Energy Conservation Act
IDeA	Improvement and Development Agency
IPPC	Integrated Pollution and Prevention Control Directive
LA	Local Authority
MRETT	Midlands Renewable Energy Technology Transfer
NETA	New Electricity Trading Arrangements
NGOs	Non-governmental Organisations
OFGEM	Office of Gas and Electricity Markets
RCEP	Royal Commission on Environmental Pollution
RDA	Regional Development Agencies
SDC	Sustainable Development Commission
SEV	Sherwood Energy Village
TNEI	The Northern Energy Initiative
URCs	Urban Regeneration Companies

Formatted: French (France)

Summary of Report

Background to this report

The Sustainable Development Commission has been examining the prospects for an area-based approach to reducing carbon emissions in which different spatial and administrative scales are examined in relation to each other. In this way areas, organisations and initiatives which have achieved significant reduction in carbon emissions, but which are often isolated, can be joined-up and good ideas and experiences more widely shared. The Commission appointed a team led by the Tyndall Centre for Climate Change Research in January 2002 to review existing experiences on 'carbon reduction' at the sub-UK scale and to draw out lessons and recommendations for a workshop and subsequent project(s).

In this report '**Scale**' refers to a range of units of different spatial dimensions. We also use it to refer to a range of administrative units operating at different spatial scales (e.g. local, regional and national governments).

Key Points

- Actions at the local to regional scale are needed to deliver extensive carbon emission reductions, but to date most strategic thinking has focused on national policy levers and mechanisms.
- There is great untapped potential for 'bottom-up' led carbon reduction at the local to regional scale to tackle social, economic and environmental objectives.
- There is a welter of different agencies, programmes and policies which influence local carbon reduction and a lack of co-ordination, information-sharing and integration between efforts as a consequence. This, and limited funding, increase the transaction costs in undertaking carbon reduction work.
- The representative bodies, executives and regional institutions (Assemblies, Development Agencies, etc.) will increasingly function as bridges between the 468 local authorities in the UK and central government and EU.
- All local authorities have undertaken standard energy efficiency measures as part of estates and housing management.
- Local authorities have limited ability to use the planning system to reduce the carbon intensity of development because the statutory framework and guidance does not permit rejection of applications on the basis of their carbon emissions.
- Reducing carbon intensity (carbon per unit of energy) can occur independently of a reduction in energy intensity (energy per unit of economic activity), e.g. through use of renewable energy. Sustainable energy requires a reduction in *both* carbon and energy intensity. Carbon intensity can be reduced at national (or international) scales, contra most energy intensity reduction, which takes place locally. What are the sustainability implications of local or regional versus national reductions in carbon intensity?
- A dozen or so local authorities have led the way on low-carbon sustainable energy over the past two decades, building up considerable experience, knowledge and skills.

- The conditions for successful local authority engagement are: enduring commitment from leading members of the council and from senior officers; in-house energy specialists driving the work forward; partnerships with private, public and NGO sectors; and ability to attract top-up funding.
- Local learning-loops emerge around successful authorities, which spin-out to motivate other local authorities, the private sector and community groups.
- Momentum and capacity are sustained by local learning-loops, bringing in new organisations, resources and enhancing the reputation and status of the partners.
- The private sector is a major actor in reducing carbon emissions, often acting corporately rather than initiating partnerships, though there are excellent examples of joint approaches with local authorities and communities.
- In part on account of restrictions imposed by clients, construction, design, architecture and development firms can, but rarely do, have a major influence over the embedded carbon in new development.
- In the Netherlands the private and NGO sectors frequently initiate partnerships with local authorities and their customers or members: this may be a consequence of more widespread district heating systems, as well as the wider-uptake of green electricity tariffs than in the UK.
- It is currently virtually impossible to measure carbon emissions at the sub-UK scale, hence to monitor the effectiveness of policy measures; this has contributed to a lack of evidence-based policymaking in the field.

The Sustainable Development Commission Area-Based Work

- There are, as yet, no carbon reduction programmes working across a wide range of spatial or organisational scales, though there are strong growth points, e.g. the Energy Saving Trust, the Councils for Climate Protection (Local Government Association) and regional efforts (e.g. RDAs). This absence may, to some extent, reflect the difficulty of organising such an activity.
- The Sustainable Development Commission should select one region or devolved administration for the area-based work, though there are arguments for, and against, selecting a region containing more leading, average or less proactive local authorities and organisations.
- Each scale in the region selected should identify a partner from another region or devolved administration with which to make a comparison, extend experience and expertise (we call this the 'low carbon pathfinder').
- The project(s) should be set against the long term carbon reduction target of 60% by 2050 as proposed by the Royal Commission for Environmental Protection. This should then be telescoped down to more immediate shorter-term milestones (e.g. 10% in next 5 years).
- The extent to which a regional target can be met by activity outside of the region (determined largely through national policy) should be decided upon in advance.
- Some work is already underway on local to regional climate change impacts and adaptation. At the present time it is better for the carbon reduction project to proceed as a separate activity, though there should be close exchange of information.

The challenges and potential obstacles in achieving earlier, and/or larger, emission reductions need to be identified at an early stage.

What the Report is about

As noted above, the Sustainable Development Commission appointed a team led by the Tyndall Centre for Climate Change Research in January 2002 to review existing experiences on 'carbon reduction' at the sub-UK scale and to draw out lessons and recommendations for a workshop and subsequent project(s).

The process

A large number of relevant individuals and organisations were informed of the project(s) via email lists. Information has been collected by submissions of project proformas (accessible via the web) and other data. Approximately 70 telephone interviews have been conducted across the UK. We would like to thank the cooperation and assistance of all those involved in providing information and their perspectives.

A new strategic focus on local to regional carbon reduction is needed

A large reduction of carbon dioxide emissions requires a combination of 'top-down' and 'bottom-up' policy measures. To date, the top-down options (taxation, national regulation, policies, programmes and guidance) have received more strategic attention than bottom-up options (pro-active local and regional initiatives). The evolving strategic role of the Devolved Administrations and regional institutions creates a favourable context for area-based carbon reduction; many of their key priorities have a strong link to carbon emissions (regeneration, inward investment, renewable energy, efficiency, transport, new markets, job creation, rural diversification, etc.). Implementation of strategies is now taking place through task forces, planning and objectives-setting, though carbon reduction typically extends across the principal sectoral and functional priorities and groupings. The 3 devolved administrations and 9 English regions also act at a necessary and appropriate scale for action: able to bring together, mobilise, stimulate learning between and represent 30 to 50 local authorities, whilst sufficiently 'close-to-the-ground' to understand and reflect local and regional distinctiveness in strategy and planning.

The potential for local to regional carbon reduction remains largely untapped

There are currently many 'transaction costs' for local authorities and other organisations to become fully engaged with the low-carbon agenda. These transaction costs arise because of:

- The inherent greater fragmentation of the demand-side of energy than of its supply-side;
- Multiplicity of funding organisations, programmes and agencies, many of which are over-lapping and not integrated;

- The need for many initiatives to work across local authority or other organisational functions, forming partnerships with NGOs, community groups, and the private sector, all of which can take a lot of time and negotiation.
- Need for experienced and dedicated staff to bid continually for outside funds as more secure funding tends not to be available (also reducing time spent on implementation and monitoring);
- The lack of integration with private-sector work on energy efficiency required under the Energy Efficiency Commitment.

To realise the full potential, better coordination and integration is required.

Local and regional carbon reduction offers the potential for tackling multiple policy and social objectives

Examples of the multiple social, economic and environmental benefits arising from carbon reduction activities and depicted in figure 1 below are perhaps more evident, tangible and 'believable' at the local to regional scale than they are nationally.

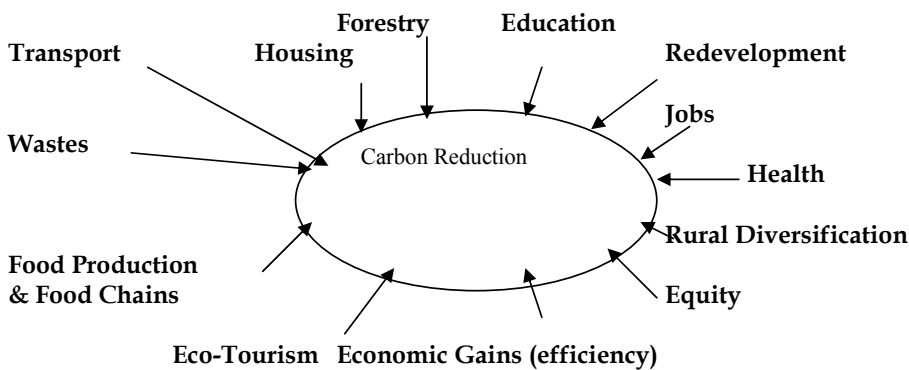


Figure One: Examples of Multiple Consequences of Carbon Reduction at the Local Scale

For example, planting fast growing trees and crops for energy not only reduces net carbon emissions but can provide rural diversification and jobs, improve biodiversity and amenity, assist remediation of brown land, provide a sink for wastes, encourage adoption and innovation of new energy technologies and new transport fuels and even promote eco-tourism. We do not, at present, possess adequate techniques for assessing the full set of potential consequences of low-carbon sustainable energy options.

Sustainable energy issues have been marginalised within most of local government (with some notable exceptions)

Local government has a long history of work in energy management in estates and asset management departments. Wider sustainable energy issues tend, however, to

fall 'between the cracks' of local government departments (housing, estates, education, parks, environment, etc.) and hence do not become the responsibility of an individual or unit. Lack of a clear allocation of responsibility and of resources, attention to other policy issues and lack of interest by elected members and senior officials probably explains most of the inactivity. Local authority energy specialists can often see the wider issues but have become 'ghettoised'.

There are three phases of local government engagement in the climate change issue: a) the early 1990s at the time of the Rio 'Earth Summit' when several authorities set ambitious carbon reduction targets; b) the mid- to late- 1990s when the Cities for Climate Protection (CCP) programme got going; and c) from 2000 to the current time, with the relaunched CCP and renewed setting of ambitious local targets, including several carbon neutral city proposals. The differences between carbon reduction and energy efficiency have not been appreciated by all local and regional authorities: the leading authorities have, however, recognised the need for efficiency, demand management and lower-carbon energy (including renewable energy) to go hand-in-hand.

Local authorities have minimal abilities to influence carbon emissions through the planning system because they would find it difficult to refuse applications on the basis that they incur higher carbon emissions than alternative developments. Where the local authority actually owns land to be developed there may be greater opportunity to influence energy efficiency and transport links; and likewise the planning authority has some persuasive influence on a quid pro quo basis where a prime site is being developed. The statutory framework and associated guidance simply does not exist to allow low-carbon sustainable energy to be required. The Transport Act 2000 does allow Local Authorities to implement Local Transport Plans, including urban traffic charges. The difficulty here is that good alternative public transport systems are frequently not available, so levies may displace rather than reduce car traffic. Reducing the carbon load from transport remains a most challenging area.

Local to regional development of sustainable energy has some success stories but is patchy

There are a dozen or so leading local authorities in the UK which have pursued low-carbon sustainable energy policies for a decade or more. This includes: Newcastle-upon-Tyne, Leicester, Nottingham, Nottinghamshire, Southampton, Bristol, Cardiff, Woking, Newark & Sherwood, Kirklees, and the London Boroughs of Sutton, Tower Hamlets, Southwark and Corporation of London. The key determining factors for local authority success stories appear to be:

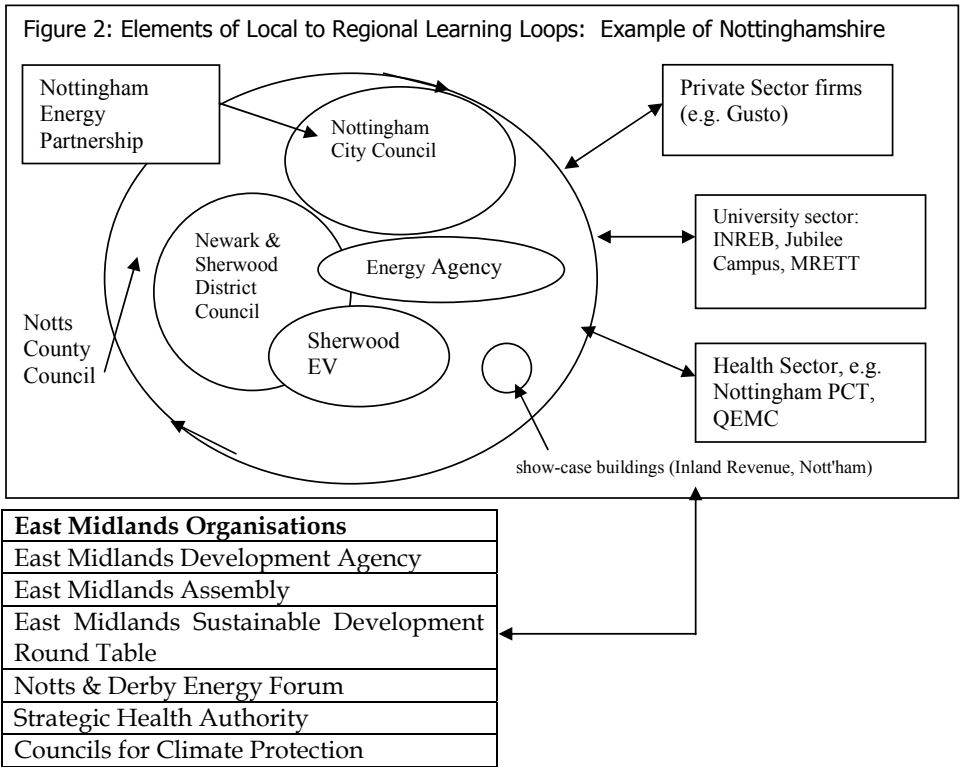
- Highly motivated and enthusiastic energy specialists, often working in the authority for a number of years;
- Obtaining high-level and enduring cross-party commitment from the elected members in the council;

- Obtaining high-level and enduring commitment from the Chief Executive or other senior members of the executive;
- Entering into partnerships with other organisations in the public, private, voluntary and NGO sectors;
- Marrying-up the 'energy management & efficiency' agenda with the wider sustainable development agenda, so increasing issue-ownership and motivation across the authority and its partners;
- Ability to access additional financial sources from central government, Europe and the private sector;
- Reputational and status gains arising from work becoming known locally, regionally, nationally and internationally;
- Ownership of substantial infrastructure for delivering low-carbon energy systems, e.g. district Combined Heat and Power systems.

At present it is largely chance where synergy between the above factors gets activity under way. This will not be a sufficient mechanism for rolling-out low-carbon programmes and policies to all 468 local authorities in the UK. Even within the proactive authority areas, the low-carbon buildings, developments and transport systems are usually islands of excellence in a sea of business as usual.

Local Learning Loops

Leading-edge local authorities are often at the epicenter of **local learning loops**. These engage parts of the community not readily reached by the local authority acting alone. Parts of the North East, South West, East Midlands, South and Central Wales present good examples of local learning loops, which are gradually extending out to the regional scale. An example of a learning loop is illustrated in figure 2; it shows how a range of scales and associated organisations in the Nottinghamshire area are interrelated, and extend outwards to the East Midlands region. Momentum is maintained through local learning loops, attracting talent, resources, small innovative firms, new partners, publicity and so on. Hence it is no accident that leading-edge low-carbon authorities, SMEs, universities, NGOs, community groups and exemplars of best practice tend to be clustered in particular locales. Local exemplars (buildings, developments, communities, etc.) have an important demonstration not readily emulated at the national scale.



The Role of Other Organisations

The involvement of other public sector organisations, NGOs, community groups and private companies in carbon reduction initiatives is set to grow, driven in part by national policy and also by market opportunities. To date some small companies have participated in local learning loops where carbon reduction meshes with, or indeed comes to mould, a company's own vision. There are good examples of public-private-community partnerships in the energy efficiency area. This includes several new hospitals (e.g. Princess Margaret's, Swindon), mixed residential & commercial combined heat and power (e.g. Barkantine (Isle of Dogs), Woking, Sheffield, Southampton) and university campus developments (e.g. Jubilee Campus, Nottingham), where design, building and architectural companies have inspired a lower-carbon route. Reducing the carbon load of development is, however, the exception rather the rule for developers and is rarely specified by the client.

Energy supply companies will invest £500 million in energy efficiency in the domestic, public and SME sectors over the next three years through the government's Energy Efficiency Commitment (EEC). Whilst this is a huge opportunity for efficiency gains, the EEC programme needs to work with the objectives of local authorities and local and regional partnerships. Other (often continental European) companies have become involved in providing technological expertise in infrastructural-type projects, e.g. CHP and fuel cells, or in building design and

architecture. Innovative community-led initiatives have spun-off from local learning loops, such as the Sherwood Energy Village.

There are (as yet) no carbon reduction Initiatives integrated across spatial or political administrative scales

Nowhere have we identified a project on carbon reduction which looks explicitly across a number of spatial and organisational scales. There are elements of such an approach in the Energy Saving Trust's Low-Carbon Innovation Programme, which include community-scale projects involving small firms and schools, and in its city-wide Planet York project, involving the public, private and household sectors, including transport. The Councils for Climate Protection pilot is also adopting an area-based approach to emission inventories, target-setting and mitigation activities. The significant organisational barriers to an area-based approach extending beyond administrative boundaries may be one reason why such integrative approaches have not emerged. The transaction and economic costs of carbon reduction are much lower where new build is taking place. Hence, large-scale area-based regeneration represents one of the best opportunities for reducing carbon emissions, but is not yet evident in partnerships such as the Urban Regeneration Companies.

International comparisons are at an early stage, but reveal some differences

Strategic thinking appears to be focused at the national level in a number of other EU countries, though many developments might have lessons for the UK. There are six times as many green electricity tariff customers in the Netherlands than in the UK (10% of households in the Netherlands, compared to less than a quarter of a percent of UK households). NGOs and companies have been active in recruiting this customer base, bringing the municipality on board as appropriate. The success is partly explained by the parity of green and normal tariffs, but is no doubt also cultural. Combined Heat & Power (CHP) plants provide 30 to 40% of the electricity in the Netherlands, compared to 6% in the UK. This has also led to much private-sector led development, since local supplies of heat and power emerge looking for a market. The Australian Cities for Climate Protection Programme has had a wide uptake and has been very well resourced by government. Partnerships around carbon reduction between UK and other EU15 cities and regions might be highly productive in sharing knowledge, experiences and resources.

At present, we cannot monitor the effectiveness of low-carbon initiatives

Reliable data on electricity consumption at the sub-UK scale is not publicly available. It is therefore virtually impossible to accurately monitor the effectiveness of local or regional policies. This has led to a lack of evaluation work in the field and poses a significant challenge to evidence-based policymaking. The single most important policy intervention for area-based carbon reduction would probably be to make post-coded energy consumption data publicly available.

Issues surrounding an area-based carbon reduction programme

Targets & Expectations

Ambitious long-term targets for carbon reduction are valuable, but often best seen as 'aspirational' given that the target formulators rarely have the agency to deliver them. Milestones can be used to monitor and manage the achievement of long-term targets over shorter time scales. The reason for realistic short-term targets is that expectations about reduction in energy use have been raised before but not met, breeding disappointment and scepticism. The key challenge is sustaining a programme of modest reductions over an extended time period to achieve substantial change. It is also vital that a partnership and community has ownership of targets and (some of) the means by which they can be achieved.

Benefits and disadvantages of selecting areas and regions

Selecting one region or devolved administration runs the risk of choosing an 'unrepresentative case' and begs the question of how the area should be chosen. The evidence presented in the report of local learning loops suggests strongly that the benefits of selecting a single region outweigh the risks. Given the complexity involved in forming wide-ranging partnerships across administrative boundaries, and between the public, private and NGO sectors, we also advise that the region selected be one with demonstrated networking capacity and history of work in the sustainable energy domain. In order to maximise the learning potential from the project, however, we suggest that the selected region partner another region or devolved administration at each spatial and organisational scale (the low carbon pathfinder approach).

Growth points for the project(s)

The project should work from the existing growth points on low carbon sustainable energy. This includes the Councils for Climate Protection, due to be extended in 2002 to all councils in the UK with an interest. It also includes the existing Energy Saving Trust programmes, the proposed regional-scale work of the Carbon Trust, and the Countryside Agency Renewables Initiative (organised sub-regionally). At the local government scale, it includes the Home Energy Conservation officers and numerous energy efficiency, renewable energy and transportation initiatives.

Incentives

There is a need for bold thinking on how incentives for carbon reduction at the local level can be provided. This is important to engage small firms and local communities, particularly if they are disadvantaged. Could a carbon trading scheme be established locally, between households, organisations and firms in a defined

area? This could be related to incentives from local authorities, energy supply companies, community development funds, and so on.

Including climate change impacts and adaptation

Issue-linkage between impacts and carbon reduction helps to provide a higher profile for both areas and provides some of the reasons *why* carbon emissions need to be reduced. In several cases, there are direct links between impacts and mitigation, e.g. the economics of integrating renewable energy technologies into buildings may change as summer and winter heating and cooling loads change. Biomass for energy on flood plains provides net carbon uptake whilst also reducing flood risks. Much of the knowledge-base, methodologies and stakeholders associated with each area are quite distinct, however. There are also differences for each topic in the extent to which impacts and responses occur at the varying spatial and organisational scales. (The impacts of climate change locally do not necessarily aggregate up-scale, whereas carbon emissions do accumulate). We recommend against a single project involving both climate change impacts, adaptation and carbon reduction, whilst encouraging sharing of information and joint project development where there is a joint adaptation and mitigation benefit.

Chapter One: Introduction

In January 2002 the Sustainable Development Commission (SDC) commissioned the Tyndall Centre to report on initiatives underway in the UK to reduce emissions of carbon dioxide and other greenhouse gases. The SDC is interested in promoting a project or set of projects on carbon reduction using a spatial approach, in which different scales are joined together for mutual benefit. It identified a review of existing spatially-based studies as the first step, including an assessment of those approaches which appear to be more or less successful and an explanation, where possible, of such successes and failures. The team put together by the Tyndall Centre included analysts of energy management at the local and regional scales, sectoral experts and policy analysts.

The challenge facing the team was to identify where initiatives had a distinct 'carbon reduction' theme. Without some filter, the review could have become swamped with huge amounts of information about all the many thousands of policies, programmes and projects relating to energy efficiency. We initially proposed filtering out all those programmes and projects which did not have an ambitious carbon reduction target, though we relaxed this condition somewhat when it was evident that many organisations thought about small, short-term targets as the first (albeit unofficial) step along the carbon reduction pathway. As a compromise we selected a reduction target of beyond the Kyoto one of -12.5% of greenhouse gases by 2010.

Approach Adopted

We collected information on projects, programmes, policies, research and other initiatives by sending email messages to a large number of individuals and email distribution lists. A standard proforma has been posted onto the Tyndall website to allow respondents to complete the basic information required for the database. We also used the proforma to collect the data we required during telephone interviews and through examination of information on websites.

We have conducted approximately 70 telephone interviews with a wide range of experts on energy management, energy efficiency, local government and its response to climate change. The breakdown of respondents is as follows:

Local Government	24
Regional Government	6
Devolved Administrations	3
Central Government	6
Energy Agencies	7

NGOs	8
Other public sector	5
Private Sector	11
Academics	1

The Structure of the Report and Authorship

Chapter Two provides a comprehensive overview of the main analytical findings of the research and its implications for future area-based carbon reduction work. It is an expanded version and justification of the summary.

Lead Author: Simon Shackley; Supporting Authors: Paul Fleming and John Turnpenny

Chapter Three provides a more detailed evaluation of experiences in local government, including a few detailed case-studies of sub-UK scale approaches and programmes. The experience of the Councils for Climate Protection from 1993 to 1999 is described and evaluated, followed by a detailed case-study analysis of Newcastle-upon-Tyne, Cambridgeshire and Leicester. The case-studies illuminate the opportunities and problems with reducing carbon emissions through local authority activities on transport, planning and energy efficiency improvements.

Lead Author: Harriet Bulkeley; Supporting Authors: Paul Fleming, Simon Shackley

Chapter Four provides a qualitative account of some of the most important and interesting developments on reducing carbon emissions from the perspective of the Sustainable Development Commission's study.

Lead Authors: Sarah Mander & Simon Shackley; Contributing Authors: Sebastian Carney, Dorian Speakman, Darryn McEvoy

Chapter Five provides some information on activities in other countries.

Lead Authors: Harriet Bulkeley (Australia), Ken Green (Netherlands); Supporting Authors: Darryn McEvoy, Paul Fleming

Appendix One: outlines the main institutions and programmes responsible for delivering energy efficiency and sustainable energy in the UK at the sub-UK scale. It attempts to provide an overview of the main players and programmes.

Lead Author: Paul Fleming, Supporting Author: Sarah Mander, Sebastian Carney, Simon Shackley

Appendix Two: The main purpose of this report is not to provide recommendations, but a number of important ones have nevertheless arisen during the analysis. These are presented in this appendix.

Lead Authors: Paul Fleming & Simon Shackley

Appendix Three: Transport is a rather unusual sector compared to other areas in terms of measures which can be adopted and appropriate scales of activity. Hence, we have included a separate discussion of opportunities for carbon reduction, and initiatives underway, in the transport sector.

Lead Author: Abigail Bristow

Appendix Four: provides the database of projects so-far identified. This is inevitably incomplete given the short time-scale in which the scoping study has been conducted and the very wide range of potential examples which could be included. The data base does, however, provide a starting point for the assemblage of a comprehensive database on low-carbon initiatives, which is (to our knowledge) unique in the UK.

Contributing authors: Sarah Mander, John Turnpenny, Darryn McEvoy, Ken Green, Simon Shackley

Limitations

Whilst much information has been obtained, the work is only a scoping study and we were to some extent dependent, given the time and resource scale, on data being provided to us. We did fairly extensive web searches and through the interviews learnt about a large number of initiatives. Nevertheless, we have undoubtedly missed some important initiatives and programmes; the sheer number of organisations, programmes, and initiatives across the UK makes this almost an inevitability. We hope that the database can be maintained and developed by an appropriate organisation as a future resource.

Acknowledgements

We would like to thank the large number of individuals who generously gave their time and consideration to the scoping study. They are listed in section (6). Special thanks are due to David Pickles (Newark & Sherwood District Council), Steve Waller (Nottingham City Council and Improvement and

Development Agency) and Don Snow (Mandix Consulting), who were particularly important in shaping the thinking of the writing team.

We would also like to thank the Sustainable Development Commission for their input, in particular Commissioner Walter Menzies and his fellow Commissioners, Georgina Wilson, Philip Dale and Duncan Eggar from the Secretariat. Thanks go also to Sue Stubbs (Tyndall), Katya Tarasova (MSM) for information collection and administrative support, Gillian Watson (Tyndall) for arranging the web-site, and Elaine Jones (Tyndall) for help in identifying business contacts.

Chapter Two: Overview of the Report

The context

1. The energy review of the Cabinet Office¹ has endorsed ambitious long-term carbon reduction targets, in line with the Royal Commission on Environmental Pollution². Through the 'Kyoto Protocol', the Government has a legally-binding target of a 12.5% reduction in emissions of six greenhouse gases by 2008-2012 and a domestic target of a 20% reduction in emissions of CO₂ by 2010. The Government has set out how it intends to reach these targets in its Climate Change Programme³. The programme includes a combination of fiscal instruments (e.g. Climate Change Levy, emissions trading), regulation (e.g. Integrated Pollution Prevention and Control (IPPC) Directive), transport policy (e.g. local transport plans) and voluntary agreements on commercial energy efficiency. Other important components are the Renewables Obligation and domestic energy efficiency improvements through utilities and local authorities. The key delivery agencies in addition to Government Departments, regional and local government are the Carbon Trust (for commercial and industrial sectors, development of low-carbon technologies, etc.) and the Energy Saving Trust (for domestic sector, including transport). Government is considering devolving targets for renewable energy to the regional scale.
2. The national programme delivers short-term carbon reduction through fiscal, regulatory and advisory policies. It is not possible to state in any detail how large long-term carbon emission reductions will be achieved. Changes in technology will no doubt be critical, as the Carbon Trust has argued⁴. Yet, we do not know which future low-carbon technologies will become dominant. Economic policy and fiscal incentives such as carbon taxes and carbon emissions trading have enormous potential, but we have little reliable information on exactly how such fiscal instruments will function and whether they alone could deliver large carbon reduction. There are also many other aspects of sustainability, such as the interaction between emissions trading, siting of pollution sources, equity and environmental justice, which need full consideration. Local and national objectives can also clash, as has been the case with the development of wind power, sanctioned by the (now-defunct) Non-Fossil Fuel Obligation (NFFO) nationally, but thwarted by local opposition, which the local planning authorities have been reluctant to ignore. Secondly the Energy efficiency Commitment (formerly the Energy Efficiency Standards of Performance) has put a duty on utilities to invest in energy efficiency. However, this investment can be in competition with Local Authorities' work on energy efficiency improvements under the Home Energy Conservation Act. The local implementation of national policy objectives cannot simply be assumed, particularly where new infrastructure, new technologies and changes in land-use are implied.

¹ PIU 2002

² RCEP 2000

³ DETR 2000

⁴ Carbon Trust 2001

A new strategic focus on local to regional carbon reduction is needed

3. The Cabinet Office energy review refrained from recommending specific long-term carbon reduction targets because (*inter alia*) such a policy commitment would only be effective as part of an international agreement. This should not deter efforts to establish ambitious long-term strategic targets for CO₂ reduction at the sub-UK scale, however: such is warranted if a precautionary approach to the science is adopted.
4. A different approach to such 'top-down' policy making is explored in this report, namely a 'bottom-up' approach from activities at sub-UK scales (e.g. individual, community, local authority, regional and devolved administration). There is a huge untapped potential for carbon reduction at the sub-UK scale which has received much less attention from national-scale policy makers. The distinction is that between 'top-down' policy, which relies for its success on setting the regulatory, fiscal and administrative context in which lower-level decisions are taken, and the 'bottom-up' approach which involves decisions being taken proactively at community, local and regional scales. The local to regional decision-takers are not simply responding to policy signals set at the national scale, therefore, but are changing the local decision-making context in which policy at all levels is being implemented. Both top-down and bottom-up decision-making approaches are healthy features of a democracy; a bias towards top-down policymaking may stifle diversity, experimentation and innovation, whilst over-reliance on bottom-up approaches produces fragmentation, replication and hence inefficiency and possible lack of learning and transfer of best knowledge and practice.
5. The time is ripe for such an approach, in particular utilising the new-found autonomy and dynamism at the regional scales in England and the devolved administrations of Scotland, Wales and Northern Ireland. All regions and parts of the UK have conducted thorough reviews of the role of renewable energy. This has been facilitated through DTI funding in the last several years and builds upon publicly-funded assessments conducted for several decades on a spatial basis. Every region and part of the UK therefore has a good baseline for developing a regional strategy on renewable energy development and most appear to be taking-up the opportunity so provided (e.g. through the Renewable Energy Support Programme in Wales). A regional renewable energy agency is already up-and-running in the North East and a new private-public renewable energy partnership has now been established in the North West.

The National Assembly of Wales has published a draft Climate Change Programme for Wales.⁵ The Assembly is the only Government in Europe to have a constitutional duty to promote sustainable development (section 121 Government of Wales Act). A comprehensive set of policies have been put in place and a disaggregated greenhouse gas emissions inventory for Wales produced. The domestic target of a 20% reduction in CO₂ emissions by 2010 is endorsed, but the difficulties associated with establishing a separate Welsh target

⁵ National Assembly for Wales 2000

are noted (e.g. distinguishing between the impact of UK-wide and devolved measures; difficulty of establishing emissions inventory) and a renewables target of 5% electricity by 2003 is proposed. Scotland's Climate Change Programme and related initiatives are extensive and include the objective of increasing electricity from renewable energy to around 18% by 2010 (significantly about the UK target of 10%, and with much greater longer-term potential).⁶ The Scottish Government is intending to introduce locational guidance on renewable energy development and improved building standards.

A review of English regional strategies indicates relative lack of attention to carbon reduction, however. The initial guidance to Regional Development Agencies (RDAs) from central government on regional strategies did not mention carbon emissions and the only core indicator for sustainable development is percentage of new homes built on previously developed land.⁷ Subsequent supplementary guidance identified greenhouse gas emissions as one factor to take into account in the appraisal of projects, and left open the possibility of including GHG emission reduction targets in regionally-specific targets. A notable exception to most RDA strategies is the Regional Action Plan and Regional Economic Strategy for Yorkshire & Humberside, which set a target for reducing emissions of the basket of six greenhouse gases by 'more than 20%' by 2010 (relative to 1990).⁸ This target and emphasis has been achieved through the Yorkshire Energy Forum, a public-private body which considers all aspects of energy consumption and demand and has produced a report on baseline energy use in the region.

Despite the specific lack of mention of carbon emission reduction in most regional strategies, what is striking is the extent to which nearly all strategies mention many of the following issues, all of which have significant overlap with the objective of reducing carbon emissions:

- Climate change as an important issue for the region
- The importance of sustainable development as a set of framing principles
- Objective of developing the environmental technologies sector, including new and renewable energy technologies
- Objective of improving efficiency and cutting out unnecessary waste
- Objective of assisting the rural economy, sustainable land-use and rural diversification
- Objective of improving quality of life, e.g. through improved built environment
- Need for a more sustainable solution to transportation within the region.

Most regions have produced Regional Sustainable Development Framework documents through Regional Assemblies and / or the regional Government Office. These have a strong emphasis on climate change, reducing energy consumption and reducing greenhouse gas (GHG) emissions. The Yorkshire & Humberside framework has a section devoted to reducing GHG emissions, which adopts the -20% CO₂ by 2010 target, and a target of 10% renewable energy

⁶ Climate Change Programme for Scotland 2000

⁷ DTI 1999, 1999a

⁸ Yorkshire Forward 2001

by 2010.⁹ It also aims to produce a regional GHG inventory and a climate change strategy. The report lists a useful set of activities required at the regional scale, as well as related activities at national, sub-regional and local-scales. A criticism levelled at regional policy-making has frequently been that the economic and sustainability policies have been pursued almost independently and without sufficient iteration. The East Midlands provides an exemplar of good practice in this regard through its Integrated Regional Strategy (IRS), which pulls together the economic and planning strategies and subjects them to a common sustainability appraisal. Many of the key challenges identified in the IRS relate directly or indirectly to reducing carbon emissions.¹⁰

The potential for local to regional carbon reduction remains largely untapped

6. Policy-making remains highly centralised in the UK, despite moves towards decentralisation in the last five years. Nowhere else in the European Union do cities and regions have as little political autonomy as is the case in England. The potential in the devolved administrations is in principle greater; Scotland, for example, has its own Climate Change Programme, the potential to establish its own greenhouse gas emissions reduction targets, its own renewable energy targets and a greenhouse gas emissions inventory. Yet, energy and transport policy are still largely the province of the UK government, and opportunities for distinctive sub-UK scale policies which will directly affect carbon emissions (such as taxation) are highly limited.
7. The capacity of the local to regional scale to act is resource-limited with respect to finance and skilled people. Under the current arrangements, success requires local to regional agencies to be highly opportunistic in seeking funding from all available routes. Whilst with some advantages, such an approach can deter longer-term strategic thinking and become a drain on limited resources through over use of personnel in continual pursuit of grants. Such an approach is also competitive, pitting organisations against each other rather than encouraging partnerships and collective working. A solely grants-led approach requires the applicants to respond to a specific 'call', and may limit the opportunities for truly innovative schemes and thinking to flourish at the local to regional scale. Resource limitations also mean that funding is directed at the implementation of projects, not on monitoring, evaluation, information-sharing and publicity. This contributes to fragmentation and does not encourage learning from past experiences (i.e. evidence-based policy).
8. The top-down approach assumes that strategic and policy decision-making takes place within central government and is then implemented at the local level. This approach can become self-reinforcing in that it reduces incentives for those who wish to think and operate strategically to work locally to regionally. It also reduces the 'ownership' of policies and programmes, since those at the local to regional scale do not perceive that they have had a large input to national policies which are rolled-out locally. Increased ownership is likely to facilitate efficient,

⁹ Regional Assembly for Yorkshire & Humberside, 2001

¹⁰ EMDA / EMRLGA, 2000

effective and creative implementation and to increase the flow of ideas from 'on the ground' back up to central government. There have been instances in the past where central government supported programmes which were technically illegal because the local authority did not possess the statutory powers to conduct the work. This illustrates the need for effective two-way communication between local and national levels.

9. Because of the large number of government departments, programmes and agencies, as well as EU programmes, from which funding is potentially available, it is virtually impossible to gain a holistic picture of what decarbonisation activities are currently taking place at the local to regional scale, a problem identified in much area-based policy¹¹. Relevant funding is available from the following departments and agencies: EST, Carbon Trust, DTI (renewables programme, construction industry), DEFRA (energy efficiency, energy crops, environment improvement fund, Warm Front, Community Energy), DTLR (planning, transport, public sector building), New Opportunities Fund, Countryside Agency, EU Commission (Thermie, SAVE, SRB, ERDF, etc.), Regional Development Agencies and local authorities. Furthermore, many government-funded schemes are administered by other not-for-profit organisations (such as NEF, CSE, CREATE, etc.) creating a further raft of relevant bodies.¹² The RCEP depicted the complex set of organisations involved, reproduced here as figure 1.
10. There has been a lack of integration in the UK between sustainable energy decision-making organisations, agencies, programmes and policies. Experience and examples of best practice in energy management, transport, low-carbon buildings and developments, low-carbon communities, companies, public sector organisations, occur in disparate circumstances across the 468 local authorities within the UK. The overall impression is one of fragmentation of activity and efforts, skills and resources.
11. Some organisations can negotiate their way through this confusing milieu of opportunities, but for some (and perhaps many) the administrative burden, the transaction and opportunity costs become overwhelming. Proposal writing takes over from actually delivering carbon reduction, or else candidate organisations do not enter into the territory of sustainable energy at all. The 'perpetual pilot project', which some funding agencies seem to prefer, can be frustrating to energy professionals who feel that they know what needs to be done but are having to continually request funding under new labels and assessment criteria.
12. Government Departments were structured prior to the emergence of climate change as a high-level policy priority. Hence, many departments and their agencies find that they have a climate-change 'interest' and support related programmes and projects. There is insufficient central coordination, compounded by European and local and regional level initiatives. It is likely that the fragmented welter of funders, programmes and projects is counter-

¹¹ PIU 2000

¹² Appendix One provides a review of the main national-level organisations and programmes delivering sustainable energy at the local scale in the UK

productive in terms of overall efficiency and effectiveness in delivering carbon reductions sustainably.

13. The dynamics of local to regional scale activities are quite distinct from national-scale dynamics. The key individuals, organisations and networks involved are different, but so also are the ways in which partnerships operate. National policy and local-regional policies can, for the most part, sit comfortably alongside one another, however. In other cases there are less easily resolved disconnections between these policy levels. A case-in-point is the Standards of Performance Programme, now re-named the Energy Efficiency Commitment. Under this programme, the gas and electricity regulator OFGEM allows a small sum of money to be levied per customer to pay for energy efficiency improvements, especially for low-income households (initially £1, now £3, per customer). Yet, private-sector led schemes have sometimes had the unintended consequence of undercutting home improvement schemes supported by the Local Authority. This is because the major suppliers were able to conduct more extensive marketing and publicity and to offer larger discounts to the target public than local authorities. There has been no formal connection between the suppliers' statutory requirement under the Energy Efficiency Commitment and the Local Authorities' statutory commitment under the Home Energy Conservation Act (HECA) to improve domestic energy efficiency.
14. The private sector and government has traditionally found it easier to deal with the supply-side of energy, since there are a relatively small number of players who can cover the range of issues required to increase or modify supply. The demand-side, on the other hand, is highly fragmented, with many different types of organisations involved at different scales, and many disparate issues. Hence, multiple-contracts are required, taking much more negotiating time and producing more complex commercial and regulatory arrangements: the transaction costs and risk of failure increase. Most government-supported work on the demand-side has dealt with individual industrial and commercial sectors (mainly through the Energy Efficiency Best Practice Programme) or at the individual / householder level (through the EST), where the issues, options and decision-making frameworks (if not always the way to effect change) are reasonably clearly set out. Local government cannot be treated as a further 'sector' as they are multi-functional, subject to democratic oversight, and facilitators as well as delivery agencies.

Local and regional carbon reduction offers the potential for tackling multiple policy and social objectives

15. Low carbon initiatives are usually perceived as being driven by national climate-change objectives. Their true benefits only emerge, however, when we include the full suite of environmental, social and economic benefits at scales from the local upwards. When seen in this light, low-carbon initiatives may be *more* sustainable at the local to regional scales than at the national scale. This reflects the availability of resources and skills locally, the institutional capacity to form partnerships, the character of the local and regional economy, social fabric and

natural environment, and the incidence of particular and often unique local to regional issues and problems. Figure 2 and Table 1, overleaf, illuminate the range of policy areas which are affected by low-carbon policies.

Figure 2: Multiple Consequences of Local to Regional Carbon Reduction Efforts

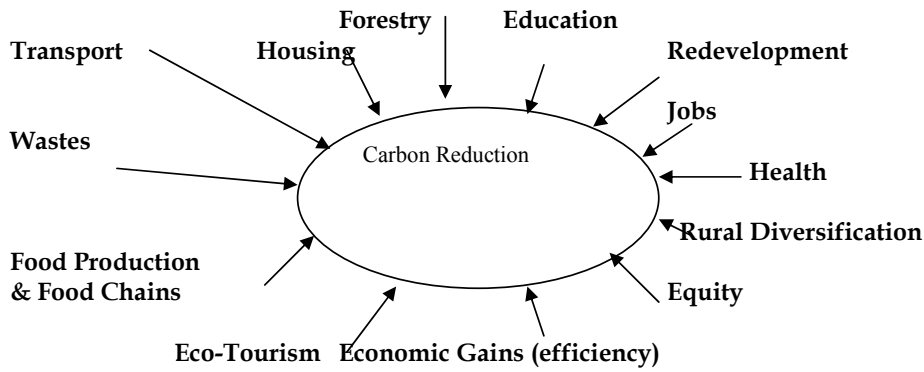


Table One: Multiple Consequences of Carbon Reduction Policies

Area	Consequences of Carbon Reduction Policies
Transport	Reduced car emissions (bioethanol fuels, hydrogen, etc.) Reduced demand for transport Improved public transport
Wastes	Reduced landfill through reduction, reuse and recycling New markets for wastes More anaerobic digestion (into gas system or CHP) Use of waste in making bioethanol for vehicles
Food Production	Reduce food miles through more local production
Eco-Tourism	A growing 'green tourism': Center Parcs, Windmills as attractions, forests & low-carbon land, Sherwood Energy Village, etc.
Economic Gains	Reduced fuel consumption (cutting costs) New industries from sustainable energy and food production
Equity	Reduced fuel poverty (affordable warmth)
Rural Diversification	Fuel crops for biodiesel; bioethanol production Coppicing for energy and heat Local food production Land management for carbon storage (low-tillage systems)
Health	Reduction in bronchial, damp-related illnesses (housing improvement) Improvement in air-quality (reduced PM _{10s} from cars; reduced NO _x and SO _x from fossil fuel emissions)
Jobs	Home improvements and maintenance New sustainable energy industries and rural economy
Redevelopment	Low-carbon design for improved quality of life and economic benefit
Education	School-based projects on carbon budgets and reduction (numeracy, literacy, design and art, etc.)
Forestry	Re/Afforestation with recreational & biodiversity benefits (e.g. community forests)
Housing	Efficiency improvements and high standards in new-build

16. A few examples of particular local to regional circumstances will help illuminate the above argument.
- Derelict land is a particular problem in the older industrialised areas. There may be opportunities for planting trees or energy crops (biomass) on brown land, which not only helps off-set carbon emissions, but also provides open green-spaces for recreation in, or near to, urban areas. English Partnerships and Yorkshire Forward have one such scheme for reclamation of old coal mining sites, whilst Community Forests in the North West are also linking-up the re-use of brown land with the low-carbon agenda across the region. If large enough schemes were developed, there would be some benefit for local employment and integration with local waste strategies is also possible (e.g. composting) and with district heating (e.g. Sheffield is investigating use of biomass in its city-centre CHP). A large number of individual buildings and facilities across the UK are now integrating local biomass into their energy systems, so reducing payment of the Climate Change Levy.
 - The future use of marginal agricultural land is in question given changing agricultural support policies and Foot and Mouth Disease. Development of biomass may make sense where local opportunities for using power and heat exist (e.g. dairies, schools), and where biodiversity objectives can be fulfilled. Use of biomass to produce bioethanol (or energy crops for biodiesel) could be integrated into local transport plans, especially where public or private-sector transport fleets can be re-fuelled centrally.
 - A totally different example involves a closed-industrial loop, e.g. through use of biomass (or more controversially waste) as a fuel, followed by sequestration of carbon dioxide from the flue gases. The overall effect could be net carbon neutral or net carbon absorbing. Local opportunities may exist where suitable geological reservoirs (e.g. salt caverns, aquifers) and infrastructure (e.g. pipelines) already exist, and where there is an abundant supply of biomass (possibly in North West, Yorkshire & Humberside and Scotland).
17. A major problem in assessing the local benefits and costs of low-carbon initiatives is the lack of robust tools and methods for reliably evaluating the ancillary benefits and costs in terms of environmental, social and economic aspects of sustainable development. In the absence of such integrated assessment, the true value of low-carbon initiatives for sustainable development is, in many cases, greatly underestimated. In summary, only when we look across the wide spectrum of potential benefits at the local to regional scales are the opportunities of a low-carbon economy fully appreciated.

Sustainable energy issues have been marginalised within most local government (with some notable exceptions)

18. The oil crisis of the early 1970s led to more concern for energy consumption in local government and most authorities had appointed an energy manager by the 1980s. In 1985 the Audit Commission produced the first national report on energy use in local government, including normalised performance indicators, resulting in an expansion in local authority activity. A report by Friends of the

Earth in 1989¹³ was instrumental in raising the profile of the local authority energy manager. In the 1990s the remit broadened out from the authority's own buildings to the public, private and domestic sector buildings within the administrative boundaries of the authority. The Energy Efficiency Advice Centres (EEACs), of which there are now 52 around the UK, were established by partnership with the Energy Saving Trust (EST), to provide free and impartial advice to the general public and small businesses. The EST has also supported innovative schemes on energy efficiency and conservation in schools and now has a transport programme. The Best Practice Programme, now part of the Carbon Trust, has produced some guidance on energy efficiency in the public sector and one report on sustainable communities, though most of its case-studies are sectorally-focused. Despite all these efforts, energy issues within local authorities have frequently become 'ghettoised' - hived-off as technical support functions within estates management, rather than being a core activity of the Sustainable Development Unit or (better still) the Chief Executive's group.

19. An important reason is the lack of political motivation on the part of Elected Members, Chief Executive and Departmental Directors due to energy being some-what 'invisible' compared to other issues. The reorganisation of local government functions and turnover of experienced staff may also have contributed to the loss of institutional memory and capacity on energy management. Energy issues typically 'fall between the cracks' of local authority departments, i.e. housing, transport, estates management, parks and community development. As such Department Directors, and the Cabinet Members with oversight of individual departments, do not see the 'whole picture' when it comes to sustainable energy and the issue as a whole is downgraded. Given such fragmentation low-carbon sustainable energy is not receiving the attention which it so critically deserves for effective local-authority action.
20. The professional organisation of energy and building specialists (e.g. architects, building service engineers, construction engineers, housing officers, community development officers, etc.) may also have mitigated against more coordinated approaches and encouraged technical fragmentation.
21. An early initiative was the formation of the Central and Local Government Environment Forum in the early 1990s. This brought together representatives from Government (Ministers, senior civil servants) and Local Government (Council Leaders and senior officers) to discuss environmental issues. The Forum's Efficiency Working Group recommended a 15% energy reduction target within 5 years, but this does not appear to have been monitored and the means for its fulfillment were never established.
22. In the wake of the Rio 'Earth Summit' in 1992, local authorities began to get actively involved in the global climate change issue, e.g. through the Cities for Climate Protection (CCP) campaign of the International Council for Local Environmental Initiatives.¹⁴ (Chapter 3). At about this time several pioneering authorities adopted ambitious carbon-reduction targets of up to 50% by 2010 or 2025 (relative to 1990), e.g. Newcastle-upon-Tyne, Newark & Sherwood and

¹³ Friends of the Earth 1989

¹⁴ ICLEI 1993

Leicester (see Table 2). Newcastle and Leicester were founding members of the European Cities Network of Energy and Environmentally Conscious Cities. Electricity privatisation and subsequent commercial and regulatory change largely hindered the realisation of these ambitious targets (Chapter 3).

Table 2: Carbon Reduction Targets Set by Local Authorities in the UK

Carbon Reduction Targets Set by Local Authorities in the UK					
Name	Target for CO ₂ reduction (energy where specified)	Target Year	Baseline	Year of Target	Targets Achieved?
Bury MBC	-30%	2005	1990		-24% community-wide reduction achieved by 2000 -30% corporate reduction by 2000
Cambridgeshire CC	- 30%	2005	1990	1991	
Leicester	- 50%	2025	1990	1992	
Newark & Sherwood DC	- 20% (possibly higher)	2010	2000	?	
Newcastle-upon-Tyne	- 45%	2010	1990	1990	
Woking	-40% energy	2000	1990	1990	Yes
Woking	-67% CO ₂	2000	1990	1990	Reduction achieved

23. The passing of the Home Energy Conservation Act (HECA) in 1996 was important in raising the profile of energy consumption in the domestic building stock within the authorities' administrative boundaries. HECA enabled ambitious targets to be set for domestic energy and carbon reduction, usually 30% efficiency improvements over 10 years, and levered some additional resource to local authorities through competitions administered by the EST. However, much larger resources (and possibly new powers) would have had to be provided to local authorities to enable most of them to meet the ambitious targets. A conclusive review of HECA is not yet available as the programme is only half-way through, but most authorities appear to be struggling to reach their targets, and some are a long way behind. (One leading edge authority, Kirklees, has reported 12% improvements in efficiency to date, suggesting that the 30% target will be challenging for many other authorities). A further problem has been the lack of an agreed methodology for calculating the improvements in energy efficiency under HECA. Hence, local authorities have used different technical models and/or surveys, but there is little evidence that the resultant data is strictly comparable.

24. A second-wave of local carbon-reduction targets were set in the mid- to late 1990s, usually of the order of -20 to -30% by 2005 or 2010 relative to 1990 (see Table 2). 16% of local authorities in the UK apparently have a climate-change policy of some description. According to a survey conducted in 2001 by the IDeA 17%

have set a community-wide emission reduction target, whilst 20% have conducted some inventory work on greenhouse gas emissions. 64% have been involved in raising awareness amongst their own employees and 68% claim to have acted to raise awareness of climate change amongst the wider community.¹⁵ More have been involved in raising awareness amongst their workforce of transport (89%) and renewable energy (92%). The CCP was re-launched in 2000 as the Councils for Climate Protection, with support from DEFRA and the Improvement and Development Agency (IDeA). The main focus of the CCP between 2000 and 2002 has been the preparation of local greenhouse inventories using a standard international methodology in the 24 pilot authorities (see Table 3). The first inventories are beginning to emerge from the pilot authorities (e.g. Lancashire and Bury in February and March 2002). 56 local authorities have recently signed the Nottingham Declaration, which proposes a carbon reduction target of -20% by 2010 (relative to 1990) (see Table 4). Some authorities are now considering even more ambitious carbon reduction targets, e.g. Newcastle-upon-Tyne and Plymouth are proposing a net zero carbon target, and Greater London is also considering a large reduction target. Several local authorities without a strong reputation in sustainable energy management are now becoming more involved in the low-carbon agenda and putting together proposals and projects, suggesting the wider appeal of carbon reduction policies than energy per se.

Table 3: List of Councils Participating in the CCP Pilot Greenhouse Gas Inventory Project (England & Wales)

The Councils for Climate Protection Pilot authorities in England	
Bristol City Council	Newark and Sherwood District Council*
Bury Metropolitan Borough Council*	Norwich City Council
Chesterfield Borough Council	Nottingham City Council*
Daventry District Council*	Nottinghamshire County Council*
Hampshire County Council*	Oldham Metropolitan Borough Council
Kirklees Metropolitan Borough Council*	Oxford City Council
Lancashire County Council	Sandwell Metropolitan Borough Council
Leicester City Council	Shropshire County Council*
London Borough of Barnet*	Slough District Council
London Borough of Camden*	Southampton City Council
London Borough of Hillingdon	Suffolk County Council
London Borough of Tower Hamlets	
London Borough of Southwark	
Asterix indicates Local Authorities which have also signed the Nottingham Declaration (as of February 2002).	

25. The achievement of carbon reduction targets in local government has been primarily through traditional energy management, efficiency and conservation policies, measures and programmes. A key driver has been to limit the incidence of 'fuel poverty' in the UK, whereby low-income households are not consuming

¹⁵ Tuxworth, B., 2002

sufficient energy for optimal comfort levels. Government support on energy efficiency has been preferentially directed towards alleviation of fuel poverty, e.g. through the Warm Front and Energy Efficiency Commitment (formerly the Energy Efficiency Standards of Performance programmes).

26. Local planning controls have not yet been particularly successful to date in achieving low-carbon development. This is despite the fact that 60 to 80% of councils include sustainable energy in the planning process and that a quarter of authorities consider energy use when deciding on individual planning applications.¹⁶ The limited success stories relate to control over development on land actually owned by the Council, where higher standards of energy efficiency and better public transport links, have been introduced (e.g. in Newcastle). To a lesser extent, planning authorities have also been able to influence development on prime land within its area (Chapter 3). There is a lack of resources on the part of local authorities to act where they have the powers to do so, however, and a lack of powers to act in many areas relevant to reducing local emissions of greenhouse gases. Even the leading-edge authorities have found it very difficult to implement policies because of lack of statutory or negotiating powers, conflict with other policy objectives (e.g. economic development and inward investment) and lack of influence over the detail of new development or use of energy in existing buildings or in transportation. Isolated pockets of good practice therefore tend to exist in a sea of business as usual, without sufficient extension of the ideas, techniques and practices.
27. Those policy programmes which have been implemented are focused, in the main, on the provision of infrastructure, technical solutions and information. It is not clear whether these approaches can achieve sufficient action by individuals, communities and businesses to reduce energy consumption. Some attempts have been made to use alternative forms of demand management which deliver a 'package' of information and opportunities for individuals, but there is strong resistance to 'hard' demand management from other parts of local authorities and their constituencies.
28. The Government is directing local authorities to consider the environmental impacts of their service delivery and policy goals through "best value". 18% of councils have integrated specific local performance indicators on greenhouse gas emissions into their Best Value programmes.¹⁷ On the other hand, successive waves of reform to local government have decentralised management of local government property and services, so that individual buildings manage their own budgets, the latest example of this being schools. This means that the benefits of scale in investing in energy efficiency measures are lost, and the council has little influence over energy management decisions in public services. Furthermore, new guidelines for benchmarking and comparing service delivery seem to neglect the sustainable development aspect written into "best value" in favour of more crude measures which focus on cost. Some local authorities have proposed including sustainable energy as a statutory requirements under Best Value.

¹⁶ Ben Tuxworth, 2002

¹⁷ Ben Tuxworth, 2002

29. The new 'Community Plans' are intended to replace a range of existing plans for different local authority functions (education, police, health, environment, transport etc.). Whilst the guidance from the DTLR surrounding their formulation includes sustainable development, a strong steer that climate change and carbon reduction be a key criteria to be included for all plans is not provided. DTLR aimed to avoid over-prescription in advising on how plans are drawn-up. The problem with this somewhat 'hands-off' approach is that it will work less well for 'invisible' than for highly visible issues. Climate change impacts and energy are not issues which tend to motivate most local activists and we know from focus group research that many members of the public think of litter, crime and local transport when asked about 'environment' rather than global issues such as climate change¹⁸. Hence, there are less likely to be local voices who are pressurising the local authority to take action on sustainable energy and to ease climate change than is the case for local issues such as air pollution, transport, crime and so on.
30. Transport is the most rapidly growing source of CO₂ emissions in the UK and probably the most difficult area to tackle. Past experience suggests a lack of influence by the local authority over public transport provision and travel choice behaviour. Policies have been dependent on voluntary action by individuals and co-operation by transport providers. There has been an over-emphasis on 'countable' measures resulting in traditional approaches - infrastructure provision and information - while more innovative, effective but less readily measured approaches have been less explored and supported. There has perhaps been a lack of resources to support non-capital projects. Politically, local authorities have found it difficult to build strong coalitions from the community and stakeholders in support of 'hard' demand management measures for transport without alternatives in place. The problem is that alternatives to car travel are only likely to be effective with the implementation of hard demand management measures (chapter 3). We appear, therefore, to be highly dependent upon incremental and radical technological advances to reduce transport-related carbon emissions (delivered mainly by the private sector).

Table 4: Local Authority Signatories to the Nottingham Declaration (as of February 2002)

The 56 Signatories to the Nottingham Declaration 2001			
Adur DC	Exeter CC	Newark & Sherwood DC	Swindon BC
Bexley C	Gateshead MBC	Norfolk CoC	Telford & Wrekin BC
Birmingham CC	Gloucester CC	North Devon DC	Torridge DC
Bournemouth BC	Hampshire CoC	North East Lincolnshire DC	Waveney DC
Brent C	Hyndburn BC	North Norfolk DC	Wellingborough BC
Broxtowe BC	Kent CoC	North Somerset Council	
Bury MBC	Kingston upon Hull CC	North Tyneside MBC	

¹⁸ Darrier et al., 1999

Cambridgeshire CoC	Kirklees MBC	Nottingham CC	
Chorley BC	Lichfield DC	Nottinghamshire CoC	
Bradford CC	LB of Barnet	Portsmouth CC	
Sunderland CC	LB of Camden	Preston BC	
Daventry DC	LB of Croyden	Rugby BC	
Derbyshire CoC	LB of Redbridge	Salford CC	
Easington DC	LB of Sutton	Shropshire CoC	
Dudley MBC	Maidstone BC	South Oxfordshire DC	
East Cambridgeshire DC	Mansfield DC	Stockport MBC	
East Staffordshire BC	Mid-Suffolk DC	Stoke CC	
The Declaration requires the local authority to reduce carbon emissions by 20% by 2010			
BC: Borough Council, C: Council, CC: City Council, CoC: County Council, DC: District Council, LB, London Borough MBC: Metropolitan Borough Council			

31. There are very few examples of programmes which are specifically designed around carbon reduction as opposed to energy efficiency and conservation. One recent exception is the EST's support of feasibility studies on low-carbon projects (the Innovation Programme), some of which are now being considered for implementation funding. Several of these projects adopt a community-focus, targeting a number of different areas of social and private housing, and including schools and local SMEs. The EST has also initiated a city-scale carbon-reduction programme in York, which has engaged public and private sector partners, the domestic sector and transport.
32. Whilst there is much overlap between carbon reduction and energy efficiency & conservation, they are not synonymous objectives or policies. Carbon emissions can be reduced by switching to low- or zero-carbon fuels (e.g. renewables) without reducing consumption. Tackling fuel poverty (a major objective of public energy efficiency programmes) does not typically reduce energy consumption as much as implied by the efficiency gains since comfort levels improve. Nevertheless, there is still a reduction in carbon emissions and further, more far-reaching, energy efficiency gains will only be achieved in such properties where fuel poverty has first been tackled¹⁹. In most cases, carbon reduction needs to go hand-in-hand with reducing energy consumption: only in this way will alternatives to existing energy sources be cost-effective and sufficient to supply demand. Ground and heat exchange pumps, solar power (photovoltaics (PV) or solar heat), biomass (for heat and/or electricity) and small-scale hydroelectric are all technologies which are far more economically feasible if the amount of energy they need to provide in the first place is reduced through efficiency improvements. As a first step, underlying energy efficiency improvements are required in the EST Innovation programme, i.e. prior to the implementation of the low-carbon technologies.
33. Energy efficiency and conservation are, therefore, likely to be a key component of low-carbon initiatives. Herein lies a danger that many of the most effective measures may not be regarded as 'original' or 'novel' and hence not attract support under programmes which are driven by the need to show novelty. At the

¹⁹ Boardman 2002

same time, low-carbon targets and programmes do require a more integrated approach than energy conservation and efficiency in buildings, i.e. tackling transport, agriculture & food, waste, urban and rural development, and other systems, as argued above. Realising the ancillary benefits requires that carbon reduction is not simply regarded as an 'add-on' to energy management activities. Climate change is also a major opportunity for sustainable energy issues to be placed at the very centre of local government strategy and programme development and for bringing in new partners in the public and private sectors, e.g. those who would be put-off by an 'energy efficiency' type programme, but will engage with a 'carbon reduction / climate change' initiative. A balance has to be struck in low carbon initiatives between tried-and-tested energy efficiency and conservation measures and more experimental, prospective and integrative approaches.

In summary, lack of clear allocation of responsibility, resources, attention to other policy issues and lack of interest by elected members and senior officials probably explains most of the inactivity on sustainable energy within local government. Low-carbon energy and energy efficiency & conservation are two sides of the sustainable energy coin and should be brought together in strategy, policy and programmes.

Local to regional development of sustainable energy has some success stories but is patchy

34. A small number of local authorities stand out as leading the way on energy and carbon reduction policies. The list includes: Newcastle-upon-Tyne City Council (CC), Leicester CC, Nottingham CC, Nottinghamshire County Council, Southampton CC, Bristol CC, Cardiff CC, Woking Borough Council, Newark & Sherwood District Council, Kirklees Metropolitan BC, and the London Boroughs of Southwark, Tower Hamlets, Sutton and Corporation of London. A few examples of leading local authorities are provided in Box 1.

Box One: Selected Examples of Leading-Edge Local Authorities

Newark & Sherwood District Council set carbon reduction targets as far back as 1992. It now has a corporate target of minus 20% by 2010 and there are suggestions for a minus 30% and minus 60% target for 2010. Nearly all the properties in the DC (c.46,000) have been surveyed and imaginative programmes for public dissemination are in place. A 20% CO₂ reduction has been achieved in the past decade from the Council owned housing. In Newark & Sherwood, the energy manager has been moved from 'estates' department to the Chief Officer's unit. He reports to three members of the Cabinet: the Chief Officer, the Member responsible for estates & housing and the Member responsible for sustainable development. This high level of political engagement with the energy issue appears to be the exception rather than the rule.

Newcastle-upon-Tyne and **Leicester City Councils** have impressive track-records on corporate and domestic energy efficiency policies and measures. Both councils set ambitious CO₂ reduction targets in the early 1990s. Whilst emission reductions have been achieved, much of this is the consequence of changes in national energy and economic policies, however. Both Councils have used the planning system to encourage low-carbon development in buildings and transportation systems. There have been problems with using the planning system, however, namely that there is an insufficiently strong steer from central government on the importance of low-carbon energy systems in assessing planning proposals (see Chapter 3). Both Councils have a continued strong interest in sustainable energy, with ambitious low-carbon proposals in Newcastle, whilst in Leicester novel approaches to encourage domestic uptake of energy efficiency schemes are being piloted, which aim to reduce the 'transaction costs' for potential customers.

35. The key determining factors for local authority success stories appear to be:

- Highly motivated and enthusiastic energy specialists within the authority, often working there for a number of years
- Obtaining high-level and enduring cross-party commitment from the elected members in the council
- Obtaining high-level and enduring commitment from the Chief Officers or other senior members of the executive (e.g. directors of departments)
- Entering into partnerships with other organisations in the public, private, voluntary and NGO sectors
- Marrying-up the 'energy management / efficiency' agenda with the sustainable development agenda including LA21, local environment and quality of life issues, social inclusion (fuel poverty), health, regeneration, transport and business efficiency. This has helped to increase ownership of, and motivation around the low-carbon sustainable energy agenda across the authority and its partners.
- Ability to access additional financial sources from central government, Europe and the private sector, which also helps in raising the profile (locally, nationally, internationally) and successful image of sustainable energy within the local authority

At present, it appears to be largely chance where synergies emerge between interested officers and senior members and / or chief officers. Engagement at Cabinet level becomes (to some extent) self-sustaining where the profile and importance of energy in the organisation is raised and becomes enshrined in

corporate policy and plans. Such chance synergies will not be sufficient to 'roll-out' low-carbon programmes and policies to all 468 local authorities in the UK. Whilst we can learn a lot from these limited number of success stories, progress on a wider scale within local government will require a combination of 'sticks, carrots and tambourines'²⁰: statutory and regulatory requirements; economic and financial incentives; greater capacity and resources to facilitate sustainable energy programmes and partnerships; more integration of activity within and across local authorities; awareness-raising, 'visioning' and dissemination; and more monitoring of policy and project effectiveness

Box Two: The Influence of Existing Infrastructures on Low Carbon Energy Supply

Existing infrastructural facilities are an important ingredient in the success of some local low-carbon initiatives. Examples of district heating schemes which make use of Combined Heat and Power (CHP) to achieve higher efficiencies are found in Sheffield, Nottingham, Southampton, East London and Woking. The involvement of the local authority as the lead or joint partner, along with an experienced private sector operator, has been important in each of these cases. Civic offices, other public buildings, leisure centres, universities, hotels and housing estates have all been important recipients of the electricity and heat generated. The system in Sheffield has been developed over the past 30 years and currently uses waste as fuel, though biomass is now also being investigated. In Southampton, the CHP scheme is more recent and makes use of local geothermal energy as well as gas. A private-sector redevelopment in the city has recently decided to buy in heat and power by extending the existing system: this was considered to be more cost-effective than paying for mains gas and electricity installation. The schemes in Woking and Southampton provide chilled water for cooling and air conditioning as well as heat, likely to become increasingly important with higher extreme temperatures under climate change.

36. If existing infrastructure occurs it has usually already been paid for, tilting the economics in favour of incremental addition. Where infrastructure has to be built from scratch, obtaining the necessary funding is difficult, especially in the context of the privatised energy markets. Potential purchasers tend to be reluctant to sign-up to long-term energy deals with suppliers, given that they are usually committing to a set price which might well become less competitive over time. Several proposed district heating CHP systems have failed because of their perceived inflexibility in this regard (e.g. Newcastle, Leicester). In this economic context, an alternative approach is to develop technologies which use the existing infrastructure. An example is micro-CHP, i.e. domestic-scale CHP systems which make use of the existing gas infrastructure. Micro-CHP could also be fuelled by biodiesel in rural areas, and in the longer-term hydrogen is a potential candidate fuel. Another possibility is the generation of methane by anaerobic digestion of biological wastes, which could potentially be incorporated into the gas network.

Local authorities can join forces with one another and other organisations in energy purchasing consortia. With the CCL in place, and the prospect of emissions trading (which local authorities are eligible to participate in), there is increasing interest in using collective purchasing power to enter into long-term agreements with energy suppliers who can guarantee to deliver energy from

²⁰ the phrase is Andrew Warren's

renewable sources either now or phased in over a set time period. Several local authorities are already major purchasers of renewably-sourced energy, e.g. Nottinghamshire County Council.

Box Three: Case-Study of Woking Borough Council

Woking Borough Council is the only local authority in the UK to supply customers with electricity on private wire combined heat and power and renewable energy networks. The council reached its 5 year corporate target (set in 1990) to reduce energy consumption by 20%, following which it set a target for 2000 of a further 20%. This has been achieved and indeed CO₂ emissions have been reduced by a massive 67% with total estimated savings of £4.5 million. The main programmes and initiatives which underlie this achievement are:

- Thameswey Condensing Boiler Scheme (offering such a boiler for same or less price as conventional boiler, plus £50 discount as part of an energy conservation package).
- Small-scale CHP heat fired absorption chiller system (first in UK) providing heating, hot water, air conditioning and electricity to the Civic Offices.
- Private-wire residential CHP for sheltered housing residents (with substantial savings to the residents). The Council has 7 such schemes and intends to introduce a new one each year.
- Establishment of Thameswey Ltd. as a public/private partnership Energy Services Company (ESCO). The company has installed CHP, thermal storage, absorption cooling with heat, chilled water and HV/LV private wire networks serving the Civic Offices, two hotels, conference and events centre, leisure complex and a multi-storey car park, all in Woking Town Centre. The system is stand-alone and 130% self-sufficient, with export of excess electricity to other council sites and housing.
- An integrated CHP and PV roof system.
- The first fuel cell CHP system in the UK at Woking Park providing heating, cooling and electricity to a swimming pool and leisure complex.

The fuel cell system was developed in partnership with a Danish green energy company. The fact that the council owns the 'wires' of the local energy grid has enabled it to support the buy-in of more expensive new technology, yet still provide a competitive price to customers. It also exempts the CHP from the problems associated with the New Electricity Trading Arrangements (NETA). Thameswey Ltd. is now looking for opportunities to export the local-grid island-generation concept to other parts of the UK. The conditions identified as critical for success of the Woking scheme are:

- Drive and enthusiasm of specific individual officers
- Cross-party support from the Council members
- The ability to establish some autonomy from the national grid
- A partnership with a Danish firm, which did not require a short-term return on investment.

Jones (2002).

Local and Regional Learning Loops

37. Where there are leading-edge local authorities we tend to see evidence of **local and regional learning loops** emerging. These learning loops engage the private sector and many areas of the public sector and the local community which local authorities find difficult to reach acting by themselves. The North East, South West and East Midlands²¹ all present good examples of local to regional learning loops. Developments spinning-out of the Centre for Alternative Technology (CAT) in central Wales (such as Dyfi Eco Valley Partnership and Dulas) are another example. The generic structure of a learning loop is illustrated in figure 3.

Sustainable energy initiatives grow out from their point of origin into the wider locale. A few strong growth points in the East Midlands have spun-off a plethora of initiatives, many of them bottom-up and in which the local authority is a partner but not necessarily the driving force. Figure 4 shows some of the key relationships which have emerged over the past 20 years in Nottinghamshire and Leicestershire out of nuclei of expertise in Leicester (Energy Action 1990, Energy Strategy 1994, HECA 1996), Newark (carbon reduction targets, 1992), Nottingham (Energy Partnership, particularly important for liaison with the business community). The Nottinghamshire & Derbyshire Local Authorities Energy Partnership arose from these growth points, as did the SAVE II Energy Agencies in Leicester and Nottinghamshire - Newark & Sherwood. Leicester is Vice-President of the EU Energie Cities Network and staff from Nottingham City Council currently lead the national CCP pilot programme for the IDeA. The University sector has been extensively involved in R&D, providing advice and training, especially since the formation of the Midlands Renewable Energy Technology Transfer (MRETT) and have helped to create the critical mass of energy-related professionals in the region. Sherwood Energy Village and Hockerton Housing Project are two spin-off community-led projects in the East Midlands with strong interests in low-carbon energy development and settlements. There are signs of regional-scale work, e.g. the East Midlands Regional Assembly has produced a *Viewpoints on Sustainable Energy*. This did not evaluate renewables in isolation (as many other regions have done) but looked at the energy efficiency and demand-side management issues and produced targets for both renewable energy and energy efficiency.

Local examples of more sustainable use of energy in buildings and communities are an important source of inspiration and further uptake. They inspire by showing that change and improvements can be achieved and can enhance an area. National exemplars are almost certainly less effective in this inspirational role - being regarded as 'too distant' and just not widely known about at the local level. Recently conducted EST focus group research has come to a similar conclusion regarding public scepticism of messages delivered centrally by government or government agencies. The research was one of the key motivations behind the Planet York programme, i.e. to bring the message down locally, and in particular to a city where the worst floods in 400 years were experienced in 2000. Effective local exemplars have included 'normal looking' buildings as well as more contemporary-type and unusual buildings. Showing

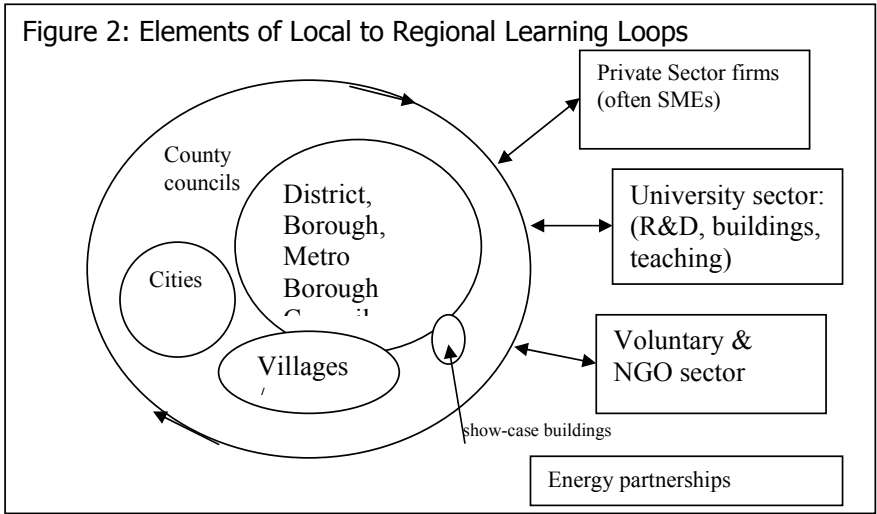
²¹ Devine-Wright et al., 2001

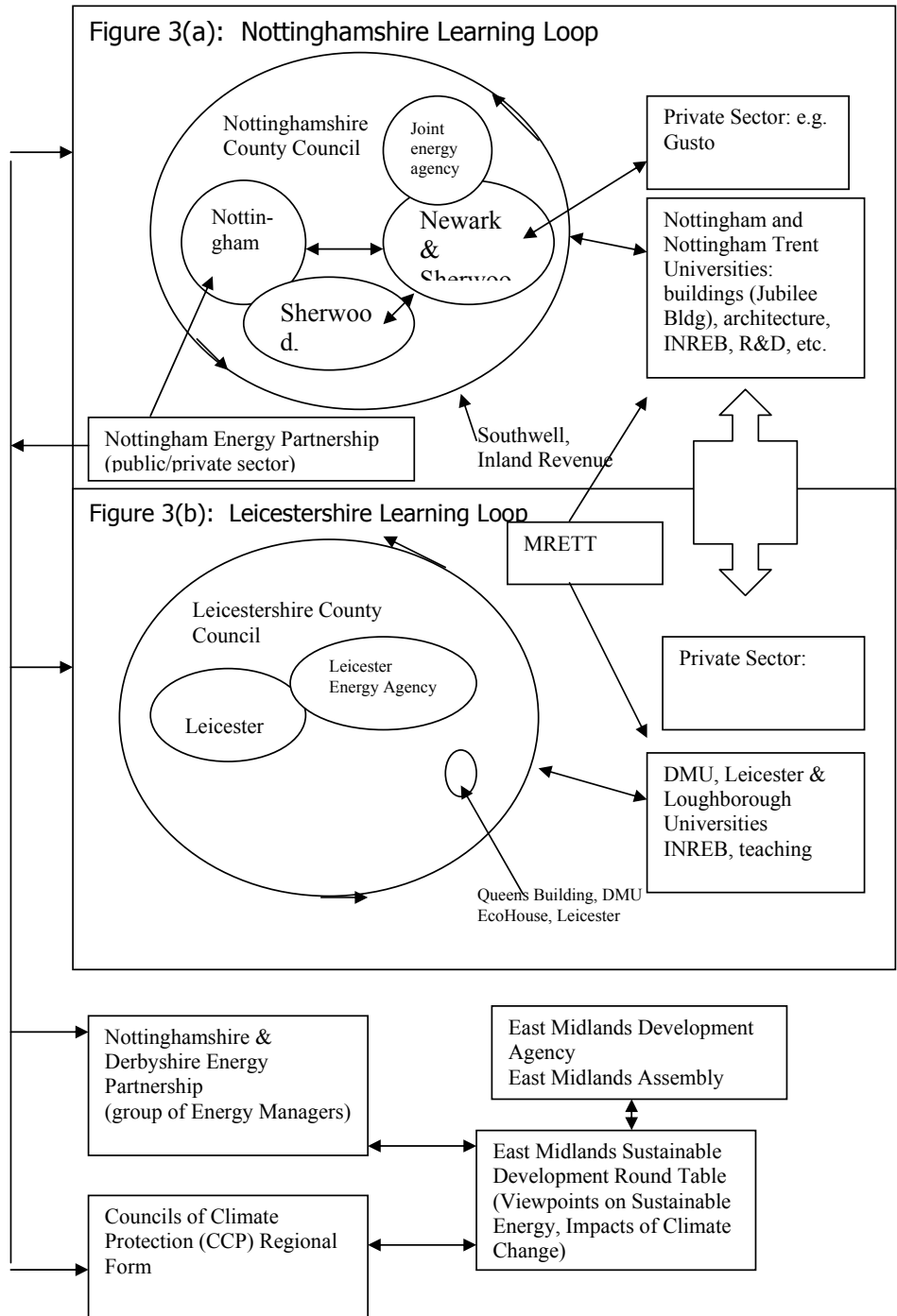
that 'normal' buildings can also be low-emission properties is important in reassuring some members of the public that a low-carbon society does not necessarily imply radical change and high technology. In summary, it is no coincidence that some of the best known energy efficient buildings, sustainable energy communities, university sustainable energy research groups and firms, are located in the same region as some of the most active local authorities.

The North East also shows evidence of local learning loops, with nuclei of expertise in Newcastle spreading out to include the North East region, in particular: The Northern Energy Initiative (TNEI) - the UK's first regional energy agency. Expertise in Bristol appears likewise to have spread out to the South West region as a whole, and from Cardiff throughout South Wales.

38. The nodes of local and regional learning networks have survived through developing the capacity and motivation to access funding from local, national and European sources. It is not surprising, therefore, that successful areas have formed Energy Agencies through applications to the EU SAVE programme, and that in many cases these Agencies are forming the hub of other sustainable energy initiatives, e.g. hosting the EST-supported Energy Efficiency Advice Centres (EEACs) and Countryside Agency Renewables Initiative partner. There is an element of 'success breeding success' when it comes to pro-active local authorities. As reputation grows regionally, nationally and internationally, this in turn strengthens local political support for initiatives and creates access to external sources of funding.
39. By definition not everyone can be a 'leader' and as more local authorities take-up the low-carbon sustainable energy challenge, so will the requirements to qualify as a leader increase. The important issue is to extend local and regional learning loops on sustainable low-carbon energy across and within all regions of the UK, not to focus on producing more leaders.

Figure 2: Elements of Local to Regional Learning Loops





There are coherent patterns of local, and possibly regional, distinctiveness

40. Some local authority areas within several regions have a strong interest in sustainable energy issues, in particular strengths on energy technologies, energy management and renewables. It is not easy to explain why activity is so high in these areas. It is possible that initiation is by chance, but that the positive effects and ancillary benefits of the learning loops then set in and sustain the activity. It is noticeable how particular individuals have been engaged with the sustainable energy issue for many years in many of the most active areas and their continued work, knowledge and experience is no doubt an important reason for continuing momentum.
41. It is less clear whether we can identify regional patterns of activity, though there is some evidence that the local learning loops do appear to spin-off into wider spatial areas from their epicentres and come to embrace whole regions. It was suggested to us that another factor is the historic involvement of regions such as North East, East Midlands, South Wales and Yorkshire & Humberside in supplying energy to other parts of the UK and further afield. There is, as a consequence, a tradition of involvement in coal, combustion technologies and infrastructure and other energy-related technologies.
42. In other regions, such as the South West, and in parts of Wales and Scotland, there is a tradition of community-involvement in energy generation and planning, in particular small-scale renewables (wind, PV, biomass, etc.). This may be due in part to the history of wind development in Cornwall, Devon and Wales which has had, from an early stage, to learn to take account of public objections in order to make progress.

The Role of Other Organisations

43. Local community groups, NGOs and individual organisations are likely to have an increasingly important role to play in undertaking low-carbon initiatives, particularly through partnership with the public and private sectors. Their potential role has not yet been fully realised. Certain local groups and NGOs have a proven record at engaging the community, bring fresh approaches and may benefit in some circumstances from not being overly-associated with the established institutions of government.
44. The role of the private sector is somewhat ambiguous. Many individual firms have achieved significant carbon reductions through their internal actions at improving efficiency and moving to low-carbon energy sources. The Energy Efficiency Best Practice Programme has reviewed, summarised and provided comprehensive guidance for the private sector (Appendix One). An example is the Co-operative Bank, which has managed to reduce its carbon emissions by 70% in the past 3 years. This has been achieved largely (87%) through buying in renewable energy, the rest through demand reduction. The decision has allowed the development of a hydro-electric power station on the Manchester Ship Canal,

so providing renewable electricity from a local source. Interface Flooring Systems measures the global warming potential per unit of its operations and has moved to source energy 100% from renewable supplies. The internal emissions trading schemes of BP Amoco and Shell are well documented and the UK Pilot Emissions Trading scheme is about to get underway.

45. Whilst individual firms have achieved much in terms of reducing energy consumption and moving to low-carbon supplies, it is much less common for firms to initiate partnerships around low-carbon energy. The exception is the Energy Efficiency Commitment, but this has been driven by regulation. Some smaller to medium-sized firms have become more active partners at the local scale (e.g. Gusto Construction in the East Midlands), their interest being motivated initially by the planning process (e.g. sustainability requirements for development of council-owned land) but then becoming self-sustaining. In other local learning loops the private sector has been more important, e.g. in the case of Woking Borough Council's innovative use of fuel cells, partnership with a Danish company was critical. (This company is, however, highly unusual in that it is not run for short-term profit). Likewise, private sector partners have been important in the development of CHP systems in Southampton, Sheffield and East London. Other important examples of private-public partnership low-carbon development are architectural design and building projects such as Princess Margaret's Hospital in Swindon and university buildings such as the Jubilee Campus (Nottingham) and Elizabeth Fry building (Norwich). A preliminary conclusion is that the private sector becomes more important where the initiative involves a high component of new technology
46. The development of some of the most innovative low-carbon energy systems at the local level in the UK appears to have been facilitated by the involvement and investment of non-UK firms. For example, in addition to the Woking example, the development of CHP utilising (inter alia) geothermal energy in Southampton was facilitated by partnership with a French firm, whilst a Finnish firm was involved in the Sheffield CHP (owned by Onyx, a subsidiary of a French company). There is an enormous potential in the UK for innovation in this area, which could be nurtured by the Carbon Trust. Thamesway Energy, for instance, owns the intellectual property rights for connecting-up technologies to a grid energy grid, and is now looking for new opportunities for further development, e.g. in Brighton and London.

The increased funds available to subsidise the Energy Efficiency Commitment – £500 million over the next three years – suggest that the private sector will in future become an even more significant delivery agent. Local authorities are likely to become less directly involved in delivery as a consequence. The longer-term impact on the labour force and on local carbon reduction capacity is unclear. The danger is that the intangible benefits of local authority involvement, such as long term engagement in the issue, helping to facilitate local networks and cultivate and maintain a skilled labour force, will not be sustained as effectively in a programme which is primarily located in the private-sector. On the other hand, the private sector may be better placed to achieve the large-scale improvements in efficiency in the domestic housing and SME sectors that is required. This is because of economies of scale, more resources and experience of marketing and advertising and a business orientation. Local and regional

government is still important, however, in supplying information and 'entry points' to firms working in their area.

47. Energy suppliers have largely moved away from operating in a single region and are UK or internationally-focused companies. This creates a potential problem for the coordination of local-regional programmes and decision-making. At the minimum better information exchange and communication is required between the Local Authority and OFGEM-sanctioned initiatives. OFGEM could go further and investigate how to help mesh private- and public-sector efforts to reduce carbon emissions, e.g. through requiring energy suppliers to take into account: regional energy efficiency improvement targets, local to regional circumstances (e.g. HECA plans) and locally or regionally-set carbon reduction targets. This would perhaps facilitate closer cooperation between energy suppliers and the local and regional authorities.
48. Individual organisations are able to provide a range of incentives to their employees and associates which go far beyond what local authorities or government agencies can provide. Large employees can, for example, offer 'green transport' incentives to their workforce. Such schemes can be extended to the customers of large organisations, including patients and visitors in the case of hospitals, and students in the case of universities and colleges. More imaginative approaches might involve large organisations entering into carbon trading with their employees or with local or regional communities. For instance, it may be far more cost-effective for a firm to reduce carbon emissions by offering to pay for energy efficiency improvements in its employees' or local residents' homes than by investment in the organisation itself (perhaps because it has already invested considerably in energy efficiency improvements). With Local Authorities potentially entering into the UK Pilot Carbon Trading scheme, there is the possibility that some of the carbon made available for trade through abatement activities could come from energy efficiency improvements in the public and private sector housing within the authorities' boundaries. This would greatly assist the achievement of HECA and carbon reduction targets by providing greater finance to tackle energy efficiency and to implement low-carbon energy solutions.

There are (as yet) no carbon reduction initiatives integrated across spatial or political administrative scales

49. Nowhere have we identified an established low-carbon initiative which formally links-up carbon reduction at different spatial scales, e.g. linking up village to town to city to county to the region. The nearest up-and-running initiative is the EST Planet York project, and the other projects under the EST's low-carbon Innovation programme, which cover district, borough, city or community scales, and some of which consider transport and waste as well as buildings and energy. However, these projects are intended to work primarily at one or two scales or units rather than across scales. Potentially more relevant, but still largely at the inception stage, are city- or local authority-scale carbon reduction programmes in Newcastle, Plymouth, Norwich, Newark & Sherwood and Kirklees and

elsewhere, in particular because they work across sectors, across private and public sector partners, and from a community to a city- or wider-scale.

50. The opportunities for more extensive linkage between political and spatial scales are widely perceived, though a number of obstacles are typically put forward ;
- Partnerships between different local authorities can be very difficult and time-consuming to arrange.
 - There are also political, economic, social and environmental differences between local authority areas which can impede partnership. (Economically-congruent areas may be in different areas and regions; different data collection often occurs between areas, etc.).
 - There are also obstacles to forming public-private sector partnerships, most of which can be overcome, but which takes considerable time and resources to negotiate.
 - Institutional structures and processes at the regional scale in England are, arguably, not sufficiently developed as yet to provide a ready-made vehicle for a regionally-coordinated approach.
 - In many policy areas a decision-making hierarchy from local to regional to national (and back again) does not exist; hence, policy learning may occur directly from local to national, or local to local. An example is the CCP, which mediates between the local and national scales, with no explicit regional dimension, though regional groupings have emerged informally in some parts of the UK, as has also happened between local authority HECA officers.
51. In many ways it is surprising that there is *not more* fragmentation between local advice and delivery agencies. In reality what appears to have happened, quite fortuitously, is that local champions have combined different functions within the same organisation, e.g. Furness Energy Partnership is both an EU Energy Agency and the Countryside Agency's renewables initiative delivery partner for Cumbria and Lancashire. The Severn & Wye Energy Agency brings together the Gloucestershire Energy Efficiency Advice Centre, the SAVE Energy Agency and the Countryside Agency renewables initiative. Such local integration brings large potential benefits, economies of scale and could be further enhanced through establishment of Regional Sustainable Energy Agencies.
52. Major opportunities exist for inclusion of carbon reduction within local to regional development and regeneration plans. The costs of achieving carbon reductions are less where low-carbon principles can be included in the design of buildings, infrastructure and transport systems. Hence, new build and particularly area-based regeneration offers some of the best opportunities for low-carbon development in the UK. There are now 10 Urban Regeneration Companies (URCs) across the UK, and they will play an increasingly important role in major urban development; several of these have included sustainability in their planning and in specific projects, e.g. low- or renewable-energy business parks and more integrated public transport systems. However, none of the URCs appear to have identified low carbon development as a specific objective or ambition. Some private-sector regeneration funds which intend to invest in the URCs have, however, identified the importance of low-carbon development (e.g. Igloo, which has £200 million available).

International comparisons are at an early stage but reveal some differences

53. Strategic thinking appears to be focused at the national level in a number of other EU countries, though many developments might have lessons for the UK. There are quite ambitious carbon reduction initiatives in several major USA cities (e.g. Seattle and Portland, Oregon) despite the US government's hostility to the Kyoto Protocol. Partnerships around carbon reduction between UK and other EU15 cities and regions (and further afield) might be highly productive in sharing knowledge, experiences and resources (e.g. along the lines of the German Marshall Fund Environmental Fellowships).
54. In the **Netherlands** there are six times as many green electricity tariff customers in the than in the UK (10% of households in the Netherlands, compared to less than a quarter of one percent of UK households). NGOs (such as WWF) and companies have been active in recruiting this customer base, bringing the municipality on board as appropriate. The success is partly explained by the parity of green and normal tariffs, but is no doubt also cultural. Combined Heat & Power (CHP) plants provide 30 to 40% of the electricity in the Netherlands, compared to 6% in the UK. This has also led to much private-sector led development, since local supplies of heat and power emerge looking for a market. Local municipality ownership of the electricity system in some areas, e.g. Amsterdam, has facilitated far greater uptake of energy efficiency measures, such as compact fluorescent lightbulbs, than is typical in the UK.
55. The **Australian** Cities for Climate Protection Programme has had a wide uptake, with 150 local authorities signing-up (covering 60% of the population). The Australian CCP has been remarkably well resourced by government, with A\$13 million being provided since 1997. There is a core CCP office of 7 people. (By contrast, the CCP in the UK is on a much smaller scale, with no permanent staff, and financed by a combination of central government and local authority support). Examples of 'action modules' under CCP-Australia include a programme on in-house energy efficiency and the 'emissions reduction incentive programme', whereby financial assistance is available for carbon-reducing measures (provided local government provides 50% funding). Between 1999 and 2001, it is claimed that the CCP has achieved the following:
- A reduction in CO₂ equivalent to 295,383 tonnes
 - The investment of A\$1.8 million in jobs
 - The investment of A\$32 million in abatement measures

While the focus of initiatives remains on 'in-house' operations, such as building retrofits, greenpower (renewable) supply and vehicle fuel conversion, some community initiatives involving education programmes and the implementation of planning regulation for energy efficient buildings are also being undertaken. The efforts of Newcastle (New South Wales) to reduce carbon emissions through transport and planning policy have run into similar problems encountered in the UK, namely the lack of influence of local government upon relevant policy, and

contradictions which emerge between local economic development and carbon reduction goals. Reliable data collection has also been a problem in Newcastle; the emphasis of the CCP there has been on obtaining accurate, local data (rather than scaling national data and trends to the local scale).

At present we cannot monitor the effectiveness of low-carbon initiatives

56. It seems remarkable, but it is the case that at present we are unable to monitor carbon emission reductions at a spatial basis below that of the UK, with the exception of Scotland. This problem has emerged since privatisation of the energy industry, since which time the data has become the commercial property of the supply companies. Prior to then data on energy consumption was available on a post-coded basis. Hence, despite all the activities which have been undertaken over the last 5 years, it has been impossible to provide definitive evidence of the difference that such measures have made to local and regional energy consumption. If there were one policy action to help reduce local to regional carbon emissions, it is probably action by the government to ensure that post-coded data on energy consumption is available. The provision of such data is consistent with the government's stated ambition for more evidence-based policy-making.
57. Several local authorities have managed to obtain some bottom-up data on electricity consumption from the principal energy supply companies operating in their area. This includes Greater London, Birmingham and Bristol and has involved lengthy negotiations. The CCP has facilitated the collection of bottom-up data on energy consumption (including transport and waste) from within the local authority itself, but also in the wider local authority area. The pilots have provided very valuable experience in data collection within the authority (e.g. changing departmental procedures so that data can be more readily collected) and provide a reliable base-line for corporate targets and activities. The CCP has also raised the profile of climate change and the need for carbon reduction within many local authorities, providing a practical way in which local authorities can respond. The local authority area greenhouse gas inventories are a preliminary attempt to obtain bottom-up data and in most cases have had to use aggregate energy consumption figures from utilities (e.g. average electricity consumption per household for the energy supplier's customer base).
58. The DTI has recently consulted potential users of local to regional energy consumption statistics, including other departments, local authorities, RDAs, devolved administrations, Audit Commission and the Environment Agency, all of whom have overwhelmingly supported the production of sub-national data.²² Some progress has been made with post-coded data now available on gas consumption from Transco, but the situation on electricity consumption still remains unclear.

²² DTI, 2001

59. A further problem in monitoring project effectiveness is the lack of consistent, publicly-available tools and methods for calculating the potential carbon savings arising from different measures in the domestic and public sector. The Building Research Establishment (BRE) has developed a well-respected model of energy consumption in UK housing (BREEAM 12), though this requires further development to take account of recent developments.
60. The ability to monitor emission reductions reliably may be one consideration in the Commission's selection of a case-study area. Simple guidelines for measuring greenhouse gas emissions (principally CO₂) would need to be provided to participants in a further stage project. There are several starting-points, such as DEFRA's guidelines for organisations and various 'carbon calculators' available on the web which permit individuals to monitor their own carbon emissions.²³ Consistency between individual or organisational calculations with those at the selected spatial scale would need to be maintained. An area-based project requires use of standardised and best-practice tools, and technical guidance from BRE and other energy researchers and consultants is required.

²³ e.g. www.gap.org.uk, www.encams.org.uk, www.bestfootforward.com

Issues Surrounding an Area-Based Carbon Reduction Programme

Targets & Expectations

61. The use of ambitious long-term CO₂ reduction targets has the advantage that it creates a 'rallying cry' for action and innovation. On the other hand, actual achievement of large reduction targets will be difficult in many instances and some of the most important policy levers and underlying drivers will not be readily available to, or controllable by, the project sponsors or participants. Some of the respondents cautioned against raising high expectations when uncertainty reigns as to the mechanisms and processes for their fulfillment. This observation was based in part upon past experience of energy management, efficiency, and associated CO₂ reduction targets, where there was perhaps more optimism about what could be achieved than turned out to be realistic.
62. The energy-embeddedness of technologies, buildings, infrastructures and material possessions, as well as short-termism in managerial and economic decision-making, transaction costs, lack of personnel time and life-style expectations, are some of the reasons why reducing energy consumption is difficult, despite its apparent medium- and long-term economic and environmental benefits. Changing expectations and individual, collective and managerial decision-making processes is complex and is likely to take significant time and negotiation. Hence, achievement of large-scale reductions in energy consumption in the short-term is unlikely. The exception is where single-event changes in industry and technology take place. For instance, the recent installation of a new incinerator at a chemical plant in Cheshire resulted in a 15% reduction in the greenhouse gas emissions of the North West region relative to 1990²⁴. The closure of the Corus steel works in Llanwern, Ebbw Vale and Bryngwyn will also make a significant contribution to carbon emission reductions in Wales, while being economically and socially devastating for those communities. These 'one-off' strategic decisions are mainly in the domain of the private sector or large organisation and are not easily repeated. Hence, a long-term perspective is necessary when aiming to achieve large-scale carbon reductions.
63. One-off decisions by major energy users, for example to invest in more efficient technologies, or to move to 100% renewably-sourced energy, can make a significant impact upon local to regional greenhouse gas emissions. Likewise, national or even international-level activities by the private or public sectors, e.g. through emissions trading, will have a large impact on local to regional emissions. An area-based project needs to establish to what extent a spatially-based target can be met through actions or initiatives elsewhere. One option is to cap the emissions reductions met through initiatives outside of a given area (as has been suggested for the Clean Development Mechanism within the United Nations Framework Convention on Climate Change).

²⁴ Mander et al. 2000

64. The multiple socio-economic and environmental benefits of carbon-reduction policies may require the setting of more ambitious targets in order to be realised. If a target reduction of, say, 5% over 10 years is set, then this can most usually be achieved by adoption of a single policy measure, e.g. home energy efficiency improvements. If, however, a more ambitious target is selected, say 30 to 50% over 20 years, then it is immediately apparent that a range of measures will be required across sectors and different types of organisations and spatial scales. The way that the 'problem' is seen and acted upon may depend to a large extent upon the target selected.
65. Ambitious indicative or aspirational long-term targets can be 'telescoped' into more binding targets or milestones for the short-term. For example, a long-term target of -60% by 2050 translates approximately to a reduction of 1% per year. This is well within the Government's own target for 2010 of -20% CO₂ emissions. Hence, a short-term target of -2% / year sustained over several decades will deliver the ambitious long-term goal. In this way, the emphasis is also placed on *sustaining* the process of emission reduction, rather than on achieving a single one-off target. Several local authorities have already been telescoping indicative long-term targets into the short term given that local strategies and plans rarely extend beyond 10 to 15 years.
66. The view was also expressed that long-term targets do not sit well with government institutions and agencies which do not have the guaranteed longevity to see them through. Against this view, however, is the experience of influential advisory bodies such as the Royal Commission on Environmental Pollution (now over three decades old). Furthermore, the absence of a long-term perspective is precisely one of the failures which sustainable development is intended to correct. Hence, it must be assumed that a long-term commitment is embedded within government on climate change issues.
67. Several respondents noted that wide 'ownership' of targets is important where actions are proposed from across the community and stakeholders. Previous experience warns against assuming agreement with carbon reduction targets and plans, and argues instead for a detailed process of consultation and facilitation, using the suite of community and stakeholder participation methods which have become more widely used in the last decade or so (focus groups, citizen panels, consensus conferences, facilitation of community disputes, etc.). As an example, in one deprived community in Burnley the principal expectation was to own a car. Clearly, significant consultation (and incentives) would be required to successfully engage such a community in a carbon reduction programme.
68. Previous experience suggests that ownership of a target or project can be obtained in one of three ways: a) bottom-up ownership, in which case the target / project comes from the initiative of a single individual or group of like-minded individuals who live and/or work in the area; b) ownership enforced by the enactment of appropriate regulatory standards and planning controls; or c) ownership encouraged by the provision of sufficient incentives, intangible benefits and guidance. A mixture of all three approaches is often desirable, as is flexibility in the balance between them. The Sherwood Energy Village (SEV), for example, is a community-led initiative to develop a sustainable settlement, energy and visitor centre on the on-time site of Ollerton Colliery. The successful

involvement of the local community in the refurbishment of Boughton Pumping Station nearby was an important motivation for the SEV. The local authority has supported the SEV from its inception, recognising that local ownership and leadership was necessary to fulfill the long-term ambition.

Benefits and Disadvantages of Selecting Areas and Regions

69. The following disadvantages of selecting a single devolved administration or region for the follow-on work have been presented by respondents.

- Selecting a single region can reduce the relevance of the project to other regions because they do not find commonalities with, and key characteristics of their region, in the case-study and / or do not have the personal contacts in that region which are so important for learning to take place.
- It is indeed difficult to identify a single region which adequately represents the set of circumstances found across the UK with respect to economy, social and environmental resources and dynamics.
- It can also seem as if the sponsors are preferentially selecting one region above others and this can create a culture of competition rather than cooperation between regions.
- The political and policy relationships within a region are frequently complex and not always smooth. Within England, we are still in the early stages of establishing regional government.
- If a single region is chosen, is it a leading-edge, an 'average' or laggard region with respect to low-carbon sustainable development? A leading-edge region is possibly less likely to find novelty in a case-study from an average or laggard region, because the local networks, partnerships and experiences will not be so readily available in the latter. A laggard region will possibly find the experience of a case-study in a leading region to be beyond its present capabilities.
- The effect of the above can be that the regional case-study is not used to facilitate actions in other regions, so reducing the potential value-added from the project.

70. The following advantages of selecting one region were, however, mentioned by the respondents.

- A single region is an increasingly cohesive political and policy entity around which activities, and resource provision and allocation, are based.
- Some regions have formed sub-regions to act as an intermediary between the region and the local authority level; these could be utilised in the project.
- Learning occurs primarily around local networks, but these can generally be extended to the regional-scale more readily than they can to the national-scale.
- The sub-regional administrative and spatial scales can be linked-up at the regional scale, which then provides a bridgehead to the national scale as well as to other regions (which can usually find at least some significant commonality with the chosen region).

71. The respondents in general did not come down one way or the other in favour or against selection of one devolved administration or region, nor on whether the region should be leading-edge, laggard or 'average'. Selection of a leading-edge region allows a demonstration to others of what can potentially be achieved. Some felt that inactive regions will not possess the necessary institutional conditions and experiences to take full advantage of a case-study. On the other hand, it was also noted that actions were most desirable in laggard regions and that 'leapfrogging' by learning from the experiences and mistakes of leading regions should be possible.

Which Devolved Administration or Region?

72. An approximate distinction can be drawn between regions based on economic growth rates, nature of the economy ('older' style = more lower value-added manufacturing and services; 'newer style' = higher-value added services and manufacturing, high-technology, knowledge-economy) and extent of urban development. All devolved administrations / regions are a complex combination of older and newer style economy, urban and rural areas, and growing and declining areas. However, we can highlight the more strongly growing newer economies in the South East, East of England and Greater London. The 'older style' economy still exists in much of the north of England, parts of the Midlands and in parts of Wales and Northern Ireland, though there are significant pockets of new style economic growth. Much of the Midlands and South West are in something of an intermediate position. The most rural area, by a long way, is Scotland, followed by Northern Ireland, Wales, the South West, the East Midlands and the East of England, though of course all regions (with the exception of Greater London) have significant rural assets. Some basis statistics concerning the regions and devolved administrations of the UK are provided in Table 5.
73. Figure 4 illustrates compares the GDP per head in different parts of the UK (relative to the average at 100). It also shows the change in GDP / head over the past 10 years. What is striking is that the wealthier regions are getting relatively wealthier, whilst the poorer regions are getting poorer. The gap between 'rich' and 'poor' is therefore increasing. (The outlying area here is Northern Ireland, which has one of the lowest GDP per capita but has been improving rapidly).

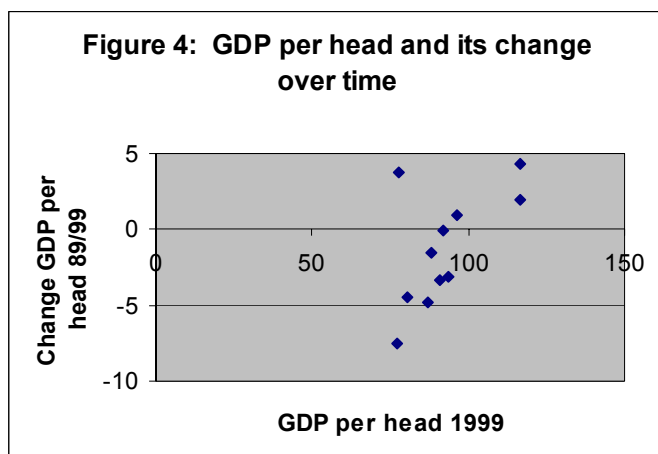
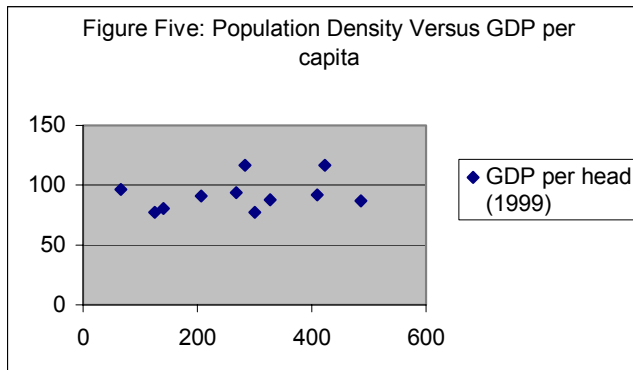


Figure 5 shows the population density (expressed as persons per square kilometer) (x axis) against the GDP per head (y axis). We have removed London from the sample, however, because its population density is 10 times higher than any other region. The plot contrasts the South East, which is densely populated and wealthier, with areas which are less densely populated and relatively poorer (e.g. Northern Ireland, Wales).



The East Midlands is perhaps the most 'representative' of the most energy active English regions in that it spans the north - south economic divide and has a good mixture of highly rural (Lincolnshire, Peak District) and industrial-urban (Nottingham, Derby and Leicester) areas. Its GDP per capita is below the national average, which represents the situation for three-quarters of the regions/devolved administrations. The South West also spans a wide range from highly rural to Bristol, which has a rapidly growing high value-added manufacturing and service-based economy. The North East has a higher population density than the South West (more in line with the English average) but has the lowest, and (during the 1990s) fastest declining, GDP per capita. Some of the benefits and weaknesses of each of the regions and devolved administrations is indicated in Table 6.

Growth Points for the Project

74. Many respondents expressed the opinion that a future area-based project should grow out of at least some of the existing initiatives which have been reviewed in this scoping study. The major potential growth points are: Councils for Climate Protection (CCP), Low Carbon Innovation Projects (EST) and other EST-supported work in schools and cities, some of the Energy Agencies, the Countryside Agency Renewable Energy Initiative and the work of local authorities, e.g. in implementing the Home Energy Conservation Act.

Incentives

75. The issue of how to provide sufficient incentives for local to regional carbon reduction needs to be a key topic of the project. Some bold ideas on this have been suggested here, including:

- Can we initiate a carbon trading scheme locally, between households, organisations, land-owners and firms in a defined area? This might illustrate how trade-offs in carbon emissions occur between heating, lighting, transport, food purchasing, waste disposal, lifestyle choices, land-use and so on.
- A voluntary carbon budgeting and trading system could possibly be related to incentives from local authorities, energy supply companies, local firms, community development funds, and so on.
- Can we allow a more limited trade between energy efficiency (or other low-carbon sustainable energy investment) in housing from private sector organisations (perhaps of their employees' homes) who would then be exempt from payment of some or all of their Climate Change Levy?
- Could private and public sector organisations invest in domestic low-carbon sustainable energy, transport, waste or land use biomass initiatives in return for the right to trade the carbon subsequently abated?
- Could a trust fund be established to support public and private-sector participation in low-carbon projects, along the lines of the Danish company involved in Woking?

The above ideas would help in providing more significant resources to invest in local to regional low-carbon sustainable energy, whether this were to be achieved by efficiency, renewables, transport, waste, land-use, etc.

Including climate change impacts and adaptation

76. Integrating low-carbon activities with climate change impacts assessment and adaptation response within local government is one way of ensuring a higher profile than is conventionally accorded to energy issues. A further advantage of such issue linkage is that the reasons *why* carbon emissions need to be reduced are more clearly articulated and help to motivate reduction activities. In some cases, there are direct links between impacts and mitigation. As heating and cooling demands change due to climate change, opportunities for integrating low-carbon technologies within buildings will also be altered. The reduction in demand for winter heating (or increase in demand for summer cooling) could, for instance, change the economic feasibility of installing renewable energy systems, CHP and micro-CHP. Likewise, projects involving the planting of trees to sequester carbon or cultivation of energy crops for low-carbon energy supply, need to consider whether and how climate change will modify the uptake of CO₂. Other land-use changes might have benefits for carbon uptake and also for better local flood protection (e.g. enhancement of lowland peat).

77. We do not, however, feel that it is necessary to combine adaptation and mitigation in a single project because much of the knowledge-base, methodologies and stakeholders associated with each area are quite distinct.

There are also differences for each topic in the extent to which impacts and responses occur at the varying spatial and organisational scales. (The impacts of climate change locally do not necessarily aggregate up-scale, whereas carbon emissions do accumulate). A coordinated approach between energy, planning, land-use, recreation, biodiversity and emergency service functions is still required to ensure that connections between climate change impacts and adaptation and carbon reduction have been considered. In many cases a straightforward exchange of information would be sufficient, whilst in others plans and projects need to be jointly prepared.

Table 5: Some Basic Statistics of the Regions & Devolved Administrations

Devolved Administration or Region	Population (thousands) (1999)	Area (sq km)	Size of Economy (GDP in millions £, 1999)	GDP per head (£) (1999)	Persons per sq km	Councils for Climate Protection
Scotland	5,119		64,050	12,512	66	
Wales	2,937		30,689	10,449	141	
Northern Ireland	1,692		17,003	10,050	125	
North East	2,581	8,592	25,875	10,024	300	0
North West	6,881	14,165	77,562	11,273	486	3
Yorkshire & Humberside	5,047	15,411	57,554	11,404	327	1
East Midlands	4,191	15,627	50,906	12,146	268	6
West Midlands	5,336	13,004	63,495	11,900	410	2
East of England	5,419	19,120	81,793	15,094	283	2
Greater London	7,285	1,580	122,816	16,859	4,611	5
South East	8,078	19,096	121,956	15,098	423	4
South West	4,936	23,929	58,151	11,782	207	0

Source: Regional Trends, Office of National Statistics

DRAFT: Table 6: Strengths and Weaknesses of Selecting Each Region or Devolved Administration

Devolved Administration or Region	Strengths	Weaknesses
Scotland	<ul style="list-style-type: none"> Cohesive polity (Scottish Government) 	<ul style="list-style-type: none"> low population dens

	<ul style="list-style-type: none"> • Distinct climate change programme • Separate GHG inventory with potential for further disaggregation • Massive potential for renewables (wind, wave, biomass) • Distinct Scottish renewables target • Pioneering renewables projects, e.g Highlands & Islands • Relevant to other devolved administrations • several 'climate change active' cities, e.g. Edinburgh & Aberdeen • Good combination of major urban conurbations with rural areas 	<ul style="list-style-type: none"> • to UK average • much more natu availability than UK : • Unique transport supply issues due to some communities 	
Wales	<ul style="list-style-type: none"> • Cohesive polity (Welsh Government) • Distinct climate change programme • Separate GHG inventory with potential for further disaggregation • great potential for renewables (wind, wave, biomass) • Distinct Welsh renewables target • well developed history of community-based renewables development • cluster of energy management & efficiency activities around Cardiff • cluster of renewable energy activities in mid-Wales (CAT, Dyfi Eco) and south Wales (Awel Aman Tawe) • regeneration in old industrial areas provides potential opportunities • relevant to other devolved administrations • Good combination of major urban conurbations with rural areas 	<ul style="list-style-type: none"> • low population dens to UK average • much more natu availability than UK : • north and south Wale quite distinct geogr: economically 	
Northern Ireland	<ul style="list-style-type: none"> • relevant to other devolved administrations • strong activities on energy management and efficiency in domestic and commercial sectors, e.g. several active Energy Agencies • great potential for renewables (wind, wave, biomass) • several active Energy Agencies • regeneration in old industrial areas provides potential opportunities • strong links and cooperation with Eire • Good combination of major urban conurbations with rural areas 	<ul style="list-style-type: none"> • energy balance traditionally differen UK due to lack of gas until recently 	
North East	<ul style="list-style-type: none"> • strong tradition of energy technologies and extraction • highly active on energy management and efficiency • only region with an energy agency – The Northern Energy Initiative (TNEI), including renewables arm (Renew) • comprehensive energy study for the North East region available • success at obtaining funds from EU and government • regeneration in old industrial areas provides potential opportunities • Newcastle-upon-Tyne considering adopting a very low carbon emissions target • Reasonable potential for renewables • Strong regional identity facilitating partnerships • Good combination of major urban conurbations with rural areas, including a National Park 	<ul style="list-style-type: none"> • The regional econ representative of th whole • The regional ec population has been c 	
North West	<ul style="list-style-type: none"> • Strong presence of Community Forests • Good combination of major urban conurbations with rural areas, including a National Park • Strong regional identity facilitating partnerships • Reasonable potential for renewables • Regional renewable energy agency (Renewables North West) with strong private-sector backing • Regeneration in old industrial areas provides potential opportunities • On-going work on disaggregating the regional GHG inventory 	<ul style="list-style-type: none"> • only one Energy Age • relative lack of energy efficiency / activities (with notab • relative lack of exen carbon buildings • relative lack of leadir • strong urban / rural north and south of reg • The regional econ representative of th whole • The regional ec population has been 	
Yorkshire & Humberside	<ul style="list-style-type: none"> • strong tradition of energy technologies and extraction • Presence of a private-public sector Yorkshire Energy Forum 	<ul style="list-style-type: none"> • The regional econ 	

	<ul style="list-style-type: none"> • Baseline study of energy supply & demand for region conducted • Strong commitment of Yorkshire Forward and Assembly to reducing carbon emissions with regional targets, plans and projects • On-going work on disaggregating the regional inventory & scenario analysis of future development options • Strong regional identity facilitating partnerships • Highly active local authorities include Kirklees MBC • Presence of EST-sponsored Planet York programme • Reasonable potential for renewables • Good combination of major urban conurbations with rural areas, including two National Parks • Site of biomass-powered energy plant 	<p>representative of the whole</p> <ul style="list-style-type: none"> • Leading-edge energy and exemplars of buildings not typical throughout the region (notable exceptions). 	
East Midlands	<ul style="list-style-type: none"> • strong tradition of energy technologies and extraction • highly active on energy management and efficiency • East Midlands DA and Assembly active on sustainable energy issues • Success at obtaining funds from EU and government • Regeneration in old industrial areas provides potential opportunities • Several carbon active cities, e.g. Leicester, Nottingham • Several carbon active LAs, e.g. Newark & Sherwood DC, Daventry • Reasonable potential for renewables • Good combination of medium-sized urban areas with rural areas, including a National Park • Exemplar buildings (Leicester) and villages (Notts.). • Sherwood Energy Village, Hockerton Housing Project • Economy spans north – south divide from old coal fields to Northampton (integrated with South East economy) • High economic growth rate in past decade 	<ul style="list-style-type: none"> • Diverse economy, more industrial than UK average • Higher economic growth than typical in most UK regions 	
West Midlands	<ul style="list-style-type: none"> • Combination of major urban conurbation with rural areas • Birmingham has undertaken inventory of GHG emissions • Birmingham active on integration of renewable energy in buildings & design (e.g. PV) 	<ul style="list-style-type: none"> • Not a strong history of energy management & efficiency (some exceptions) 	
East of England	<ul style="list-style-type: none"> • reasonable potential for renewables • straw waste power plant in Ely and other biomass development potential is high (energy crops, etc.) • East of England Development Agency active on sustainable development and energy issues • Active community-based renewables programmes (e.g. Swaffham) • Strong research and technology strengths around Cambridge 	<ul style="list-style-type: none"> • Dispersed urban areas • Contrast between East of England and home counties parts of UK 	
Greater London	<ul style="list-style-type: none"> • energy audit and study for Greater London completed • several Energy Agencies active in Greater London • strong economic growth in past decade and leading way to new economy in UK • several leading-edge low-carbon developments (e.g. BedZed in Sutton, Barkantine Isle of Dogs CHP) • Mayoral Office, creating distinct polity • HQs of many leading companies and agencies • Active sustainable energy-related NGOs 	<ul style="list-style-type: none"> • economy atypical of UK (more service-based) • public transport issues rest of UK • no significant rural areas • renewables potential from elsewhere in UK 	
South East	<ul style="list-style-type: none"> • strong economic growth in past decade and leading way to new economy in UK • Thamesway is leading-edge example of Energy Service partnership • Woking Borough Council provides leading-edge examples of local authority action on energy management, efficiency and integration of 	<ul style="list-style-type: none"> • economy atypical of UK • atypical in relation to region and Greater London 	

	renewables <ul style="list-style-type: none"> • Strong regional partnership on climate change impacts 		
South West	<ul style="list-style-type: none"> • strong tradition of community-based renewables development in Cornwall, Devon, Gloucestershire, Bristol, Somerset, etc. • this experience being rolled-out across the region • strong tradition of energy management and efficiency work in Bristol • good combination of medium-sized urban areas with rural areas, including two National Parks • large potential for renewables development (biomass, wave, wind, etc.) • strong regional partnerships around climate change and sustainability 	<ul style="list-style-type: none"> • quite heterogeneous r 	

Chapter Three: Local Government Experiences

“Global agreements and national regulations and incentives may be needed to encourage or require such [carbon] abatement, but abatement actually occurs at the local level when people and their organisations modify their behaviour, change their activities, and employ different technologies”.²⁵

3.1. Context

Increased understanding of the close mutual interaction between global and local processes has led to a focus on regional or urban scale for analysing and promoting sustainable development²⁶. As a consequence, experience in the 1990s was one of a shifting focus towards sustainable development at the level of local economies. Although regional and local measures are thought to be indispensable additions to policies operating at national and international scales, policy initiatives should not be seen as a purely ‘top-down’ process, with responsibility for environmental policy passed to the local scale. They should, rather, be seen as part of an integrated approach to solving complex and multi-layered problems. In this respect, it is also important to avoid the notion of the city or local authority area as a self-contained, bounded geographical entity. Instead of being closed systems, where natural resources are used in an economical way to provide energy (and any unused material is recycled within a circular metabolism), local authority areas are highly dependent open systems.

Although the policy debate over climate change tends to take place in global and national arenas, “action to abate greenhouse gas emissions is inherently within the provenance of local institutions and communities”.²⁷ The local level is therefore seen as an important driving force for controlling and reducing greenhouse gas emissions. Action on greenhouse gas reduction will also need to be sympathetic to societal goals and preferences to ensure effective remedial measures. This is considered most coherent at the local scale.²⁸ Following through this line of argument, local authorities are actors well placed to influence urban energy use through the implementation of policies customised to reflect local nuances. They have a special status as local, directly elected bodies and are considered uniquely placed to provide vision and leadership to their local communities and to take forward remedial action needed on the ground. Their importance is cited as critical to efforts to address the climate change threat²⁹, with their wide-ranging responsibilities and contacts seen as an important element in delivering the national climate change programme.

Although natural resource flows are oblivious to political/administrative boundaries, there are positive ‘opportunistic’ benefits in terms of access to industrial and socio-economic data, with the municipality viewed as a suitable geographical entity in relation to data collection, statistical analysis and political competence.³⁰ However, a major obstacle to successful energy management at the UK local-authority scale is the lack of data following the privatisation process. The entrance of a proliferation of new companies has resulted in the demise of centrally held information, and even when available the fear of competition is hindering access, with ‘commercial confidentiality’ used to withhold information. This acts to

²⁵ Kates *et al*, 1998: p280

²⁶ see for example: Nijkamp & Perrels, 1994; Angel *et al*, 1998; Capello *et al*, 1999

²⁷ Easterling *et al*, 1998: p247

²⁸ National Research Council, 1999

²⁹ Department of the Environment, Transport and the Regions, 2000

³⁰ EC Expert Group on the Urban Environment, 1996

reduce confidence in quantitative results, hampering informed decision-making, and limiting the effectiveness of the 'local' approach to reducing carbon intensity. It is essential if the goal of sustainable development is to be striven for, that local data are made accessible, both to aid decision-making and provide monitoring and assessment capability.

In this chapter we review the experience of local government in the sustainable use of energy, starting with a historical perspective. We then go to examine the role of the local authority in planning, transport and buildings management. The main substance of the chapter is three detailed case-studies of several of the most active local authorities in the UK, researched and written by Harriet Bulkeley.³¹

Whilst we undertake a critical review of the past activities of local authorities in the UK, we would like to stress that much of their work on carbon-reduction has been largely voluntary. Even where a statutory responsibility exists, resources commensurate with the designated tasks have usually not been available. Several local authorities were already involved in European or other international work on energy and it was a natural extension of their interests and experience to participate in the climate change campaigns described below. Substantial benefits were achieved through this international networking and exchange of experience, with several local authority officials subsequently helping develop local government programmes and advising the Energy Saving Trust.

3.2. A Brief Review of Local Authorities and Energy Issues

Historical Development

Local authorities began to consider energy and appoint energy managers during the 1970s. This was a period of relatively high spending on energy efficiency measures. The oil crisis had convinced local authorities that action needed to be taken to reduce energy costs and money was available to invest in energy efficiency measures. The large local authorities (county councils and metropolitan district councils) appointed energy managers and the larger district councils did likewise. The smaller district councils nominated someone to take that responsibility, but as part of their "normal" job function.

Most local authorities had appointed some form of energy management staff by the 1980s. They were undertaking work such as:

- Energy efficiency investments in boilers, heating controls, swimming pool covers, etc.
- Monitoring utility bills to detect excessive consumption
- Producing annual energy reports detailing progress in the past 12 months.
- Purchasing electricity, gas, solid fuel, oil and water on behalf of the local authority.

³¹ The research was conducted by Harriet Bulkeley through a Research Fellowship at St. Catharine's College Cambridge, with funding from the Nuffield Foundation. This support is gratefully acknowledged, however the nature of the research undertaken and the views expressed are those of Dr Bulkeley, and do not represent either body.

In 1985, the Audit Commission produced a key report on local authorities and energy. This identified substantial financial savings in local authorities through the better management of energy. It recommended that each local authority employ one person for every £1,000,000 of the energy budget. The Audit Commission report resulted in an expansion in local authority energy efficiency activity. For the first time, energy managers had a national report to refer to and were able to compare the performance of their buildings with other buildings through the Audit Commission's normalised performance indicators. These indicators took the annual energy consumption for a building and normalised it with floor area population and other factors to come up with a series of benchmarks with which different buildings can be compared.

In 1989, Friends of the Earth published its *Charter for Local Government*. This report identified a series of actions that Friends of the Earth recommended local authorities should take. The Friends of the Earth Report proved instrumental in increasing the profile of the local authority energy manager. Local authorities received the Friends of the Earth report and prepared responses to it. The report identified energy efficiency and renewable energy measures as a key measure to reduce greenhouse gas emissions. Local authority energy managers were able to promote their work to a wider local authority audience.

Traditionally the local authority energy manager had often been marginalized within the technical department. This meant they were unable to recognise the non-technical barriers to energy efficiency and also often failed to get energy efficiency on the political agenda. In 1992, the then Local Authorities Association (now the Local Government Association) produced the *Environmental Good Practice Guide*. This had a chapter devoted to energy and helped define the wider role of the local authority energy manager. Energy managers were now being appointed from a non-technical as well as a technical background with skills enabling them to liaise effectively with other departments in the local authority as well as communicating with members of the public and elected members. Energy efficiency was now on the political agenda at the national forum representing local authorities. The LGA also supported the work of the International Council for Local and Environmental Initiatives (ICLEI) and encouraged a UK version of the Cities for Climate Protection campaign (reviewed in detail in section 3.3.).

The wide role of the local authority energy manager was also reflected in the Local Government Association publication *Energy Services for Sustainable Communities* in 1998. This report described an energy services approach to local authority energy management and highlighted the energy hierarchy where the first priority should be to reduce the need for energy followed by maximising renewable energy. With the advent of the Energy Saving Trust several local authorities began to operate Energy Efficiency Advice Centres (EEACs). The EEACs provide free impartial advice to the general public and to small business. The Energy Saving Trust funded the Local Authorities Energy Advisory Service to provide specific guidance to local authorities. This was renamed Practical Help in 2001 and now offers a first point of contact for local authority officers. This is aimed not at only energy managers but also housing officers, chief executives and elected members. (See <http://www.practicalhelp.org.uk/>). The Carbon Trust could provide further funding for local authority work once their work programme has been agreed. The Department for Environment, Food and Rural Affairs announced a review of local authorities and energy activity in July 2001³². This is the first time that government has conducted a review of energy activity at the local level and it should see many responses from local authorities identifying the comprehensive role that they have play in helping the government meet its greenhouse gas emissions targets, fuel poverty targets etc.

Local Government Activities on Reducing Carbon Emissions

³² <http://www.defra.gov.uk/environment/energy/heca95/review/tor.htm>

Local authorities have the potential to make significant reductions to emissions of greenhouse gases in two ways. One is through the development of cutting-edge energy conservation or renewable energy projects, usually on a limited scale and which serve as 'demonstrations' of the range of possible actions. The second way is through the adoption of policies and programmes which seek to change energy use in 'usual' practices. While such initiatives can be seen as incremental and small-scale, they have the advantage of addressing existing as well as new buildings, and of creating structural, long-lasting changes to 'business as usual', which in turn can lead to large reductions in energy use over time. In essence, four key areas of potential action by local authorities to mitigate climate change can be identified:

- the supply and use of energy in the built environment;
- the use of energy in the transport sector;
- the form and design of urban areas; and
- the production and disposal of waste.

Local authorities have in some cases been able to impose higher standards than the UK minimum through ownership of land, or have provided strong encouragement through supplementary planning guidance. Energy purchasing policies by large authorities or consortia can be important in encouraging development of renewable energy or other low-carbon sources (a strategy pursued in Nottinghamshire and being investigated in Sheffield). Monitoring activities are costly for smaller authorities and there is a need for more assistance and user-friendly monitoring tools.

Planning

The planning system essentially has two functions: to plan development and to control it. These are undertaken by different parts of local government responsible for 'development planning' and 'development control' under the direction of national legislation and guidance notes.³³ Since the early 1990s, "successive governments have identified the land-use planning system as one of society's key mechanisms for delivering more sustainable development. ... [and] this has become a clear aim of central government policy"³⁴ In widening the acceptable remit of planning, interest has been focused on the use of energy within urban places. Despite the potential role of planning in promoting energy conservation and renewable energy, analysis has shown that few policies or practices towards this end have been included in strategic planning documents or development control decisions.³⁵ In Newcastle-upon-Tyne, attempts have been made to integrate energy and climate change considerations into both the form and design of development. Looking at this case-study in section 3.4 we see that while the planning system is essential for decarbonisation at the local level, significant barriers exist in realising these goals. The main findings from the case-study are:

³³ Rydin 1998

³⁴ Bruff and Wood 2000: 519

³⁵ Counsell 1998; Owens 1992

- ◆ The planning system is an important arena for achieving significant reductions in greenhouse gas emissions through energy efficiency and reducing the demand for energy use over the long term.
- ◆ In Newcastle, and other local authorities, this potential has been realised and written into planning policy.
- ◆ Implementing climate protection in practice, either through the location or design of new developments, has proven more difficult, and has only taken place in 'exceptional' rather than normal circumstances (e.g. where the Council owns the land, or where they can exert leverage over developers eager to exploit prime sites).
- ◆ The main barriers are: a lack of power to enforce climate protection measures in development control decisions; potential for contradictions between regeneration and sustainability objectives.
- ◆ In order to build on potential in this area for decarbonisation, the following will be important: government guidance on the weight which should be given to climate protection measures in planning decisions, and evidence that this is being acted upon in public enquiries; integration of climate change objectives across the local authority; and challenging perceptions among stakeholders that there is necessarily a contradiction between environmental and economic objectives.

Transport

Transport accounts for about a quarter of the UK's greenhouse gas emissions and is projected to be the fastest growing source of future emissions.³⁶ During the 1990s, currents of "new realist" thinking were developing in local authorities along the lines of those which have developed nationally over the past decade: that rather than provide for increased traffic growth, the goal of local transport policy should be to take an integrated approach to land use and transport planning, promote travel choice and implement demand management where necessary.³⁷ In part, this was a response to the evolving national agenda and changes in government funding for local transport towards packages of measures and integrated strategies, but it also reflected an increasing "climate of desperation"³⁸ over the level of traffic growth and its associated impacts in some local authorities. The ability of local authorities to reduce emissions of greenhouse gases from the transport sector is proportionate to their ability to decide upon and implement demand management measures. During the mid-1990s, Cambridgeshire County Council adopted a target of reducing emissions of carbon dioxide by 30% below 1990 levels by 2005, and transport policy was frequently cited as a means through which this target would be pursued. By examining this case-study in section 3.4. the problems and prospects for local action on climate change in the transport sector can be illustrated. The main findings from the case-study are:

³⁶ DETR (2000)

³⁷ Goodwin 1996; Vigar 2000; Pemberton 2000

³⁸ Vigar 2000

- ◆ Local transport planning is a critical area for reducing emissions of greenhouse gases from the fastest growing sector in the UK.
- ◆ Since the mid-1990s, Cambridgeshire County Council has recognised transport planning as a means of achieving its target of reducing emissions of greenhouse gases to 30% below 1990 levels by 2005.
- ◆ In order to reduce emissions of greenhouse gases from the transport sector, local authorities need to implement demand management strategies which reduce the overall rate of traffic (or traffic growth, though emissions would continue to rise over time).
- ◆ In practice, the influence of local authorities over transport demand is limited by: dependency on transport providers; dependency on policy actions which stress infrastructure and information provision as a means of effecting behaviour change; (limited) resources which are targeted at capital projects; a lack of political will at local and national levels in implementing 'hard' demand management measures.
- ◆ To address these issues, the presumption that economic growth necessarily produces traffic growth needs to be challenged by the introduction of more radical demand reduction measures, including, but not limited to, the use of economic incentives.

Transport is an issue which requires a national perspective just as much as the provision and demand management of electricity and gas. We have provided a review of transport policy levers and initiatives at the national scale in the UK as Appendix Three. Amongst the key messages to emerge are:

- An integrated approach is vital because policy action on one measure (e.g. parking levies, urban road pricing) will tend to result in changing behaviours, and hence often does not have the intended effects.
- Current 'business as usual' (BAU) trends suggest an increase of 1.7 times in carbon emissions by 20XX (due to growth in the number and length of car journeys and lower occupancy rates, only partially set off by improved vehicle efficiency).³⁹
- To achieve 40% reduction in carbon emissions from transport by vehicle efficiency alone, there would need to be a nearly four fold increase in existing average engine efficiency.
- Substantial modal shift from: 88% of journeys by car (current) to 65%, a increase in bus use by two and a half times (25% of trips), and a four-fold increase in rail (to 8%) would only succeed in slowing down the increase in transport-related carbon emissions.
- In addition to the above modal shifts, a 40% reduction in transport-related carbon emissions would also require: limiting growth in car and bus journeys (from 50% in the BAU baseline to 30%); halving the growth in trip length (except for rail, which would pick-up longer car journeys); and a 2.75 increase in average fuel efficiency.
- The above estimates are quite sensitive to assumptions about the average number of people travelling on a bus. This has fallen from 15.8 in 1980 to 10.9 in 2000, though remains higher in some areas (e.g. 12.5 in London).⁴⁰
- It can be seen from the above that tackling carbon emissions from transport requires actions on all fronts: demand-side management and behavioural change, planning, regulation and financial (dis)incentives. Even if significant progress is made on these fronts, however, delivering significant carbon reductions will depend heavily upon technological change, both incremental (efficiency gains) and radical (fuel cells utilising hydrogen).

³⁹ Potter et al. (2001), Potter 2001

⁴⁰ DTLR 2001b

The Built Environment

A growing interest in the concept of 'sustainable cities' led to European funding for urban energy studies and the connections between land-use planning and energy use began to be explored.⁴¹ With the introduction of the Home Energy Conservation Act (HECA) in 1996, these concerns gained statutory weight within local authorities. Under HECA, local authorities are obliged to produce a report detailing practicable and cost-effective energy conservation improvements across the housing stock in their area, and to work towards the target of reducing emissions of carbon dioxide from the housing sector by 30% of 1990 levels by 2005.⁴² However, as Jones and Leach point out, while local authorities are required to report on the state of housing in their area, and to devise an energy efficiency policy, they are not legally obliged to implement it. Furthermore, little additional funding has been made available to implement the measures suggested in the HECA strategies, and that which is available is allocated on the basis of competition *between* authorities. While the intention behind the Act was to improve the energy efficiency of housing across local authorities, evidence to date suggests that it has been those authorities which have a history of interest and action on home energy conservation which have continued to be the most active, and which have benefited most from the additional funding available.⁴³

In pursuing energy management in the built environment, local authorities have at least four strategies at their disposal: first, providing alternative energy supplies; second, requiring energy efficient building standards; third, reducing energy consumed in the domestic sector by changing the behaviour of individuals; and finally, addressing their own consumption of energy. The case-study of Leicester City Council in section 3.4. reveals the potential, and problems, in pursuing such strategies in order to reduce local emissions of greenhouse gases. The key findings from the case-study are as follows:

- ◆ Leicester City Council has a long involvement with urban energy management, and has implemented a number of successful schemes in this field.
- ◆ The development of initiatives to address energy use within the built environment and the city council's own operations over the past decade has been made possible by a number of different factors. These include: the need to act on their 'environment city' designation; the commitment and interest of individual officers and councillors; access to external sources of funding at national and European levels; shifts in national policy on home energy conservation; and the political kudos given by national and international recognition of Leicester's achievements.
- ◆ However, even given this positive context, it is not clear that the City Council will achieve its ambitious targets for reducing energy use and emissions of greenhouse gases in the city. Within the Council, reductions of energy use in the order of 6 per cent have been made, and renewable energy projects have been established, but across the city energy use is growing, though by less than predicted under a 'business as usual' scenario.
- ◆ Despite the different innovative approaches to energy management which Leicester has experimented with, the emphasis remains on the potential of technical solutions and voluntary action for reducing energy use and emissions of carbon dioxide. Given the lack of statutory powers within local authorities to address the institutional contexts of energy supply and demand, or to regulate energy use and supply, it is not surprising that this approach should dominate local energy management policy. Whether or not it can deliver

⁴¹ Guy and Marvin 2001

⁴² Jones and Leach 2000

⁴³ Jones and Leach 2000, McEvoy et al. 2001

the reduction of emissions from the domestic sector required to meet long-term climate change goals is doubtful.

- ◆ This suggests that what local energy management needs is not 'more of the same' on a larger scale, but a different approach which addresses the reasons why individuals and companies do not take voluntary action to implement energy conservation, the beginnings of which can be seen in schemes such as 'Energy Sense'.

The Key Barriers to Energy Efficiency in Local Government

The roles, responsibilities and legislative framework of UK local authorities are wide ranging and complex. Dealing with local government, is unlike dealing with any other sector. This causes particular challenges when looking at energy efficiency and local authority buildings. The authority needs to have an effective policy for energy efficiency in school buildings, energy efficiency in new and refurbished buildings as well as looking at the energy of the community as a whole. The most successful local authorities take a comprehensive view of energy and greenhouse gas emissions and attempt to encourage all sectors to meet locally agreed targets. We focus here on the key barriers that are currently preventing many authorities from implementing energy efficiency measures. These are:

- The need to convince key decision makers within the local authority given multiple priorities and pressures, fragmentation of energy between departments and no clear 'ownership' of the energy portfolio at Director or Cabinet level
- The need to have knowledgeable technical staff
- The need for all departments and staff to recognise the issue
- Access to finance to fund energy efficiency measure in local authority buildings
- The ability to monitor the success of the measures
- The ability to promote successes and to increase public awareness of energy and greenhouse gas emissions

Many local authorities would like to see changes to government policy to enable them to:

- Ensure that all new and refurbished buildings in their area meet higher standards of energy efficiency than are specified in the current regulations. Many local authorities felt that a key national problem is relatively poor national guidance on standards for energy efficiency. A much higher set of standards is proposed in the EEBPP General Information Report 53 and some local authority energy managers have proposed that these standards should be applied to all buildings that make use of government money.
- Provide funding to 'invest to save', i.e. a change in purchase financing such that the longer-term savings arising from measures can be included in the current spend (rather than leaving money in the bank).

However, much can be done, and has been achieved, within the framework of existing regulations. Indeed, it could be argued that what has been achieved by some leading local authorities is despite, rather than because of, government. In the absence of national standards, leading authorities may wish to produce local standards (e.g. along the line of what has been proposed in GIR 53).

The Need to Relate Energy Benefits to Other Key Drivers

Local government faces many key policy drivers apart from energy and climate change, including:

- Best value
- Community plans
- Neighbourhood renewal fund
- Fuel Poverty

These latter drivers are the direct results of government initiatives. The non-energy benefits of energy efficiency have to be identified and are important in galvanising political interest and activity. These benefits include:

- Helping to provide affordable warmth: providing energy efficient homes means less money is spent on energy and more money is available for spending in the local economy. For each £1 saved, it is estimated that a third of this amount benefits the local economy.
- Reducing illness during the winter period so limiting pressure on the National Health Service.
- Reducing running costs, increasing value and competitiveness and maintaining jobs in the local economy.
- Creating local jobs and a potential market for new energy efficiency goods and services that could be provided locally.
- Contributing towards local air quality standards.

The best time to implement energy efficiency measures is in parallel with other building and maintenance work that is being undertaken.

3.3. The Cities for Climate Protection Programme in the UK 1993-1999

In this case-study, we address the experiences of the first phase of the CCP from the early- to late-1990s. The CCP has since evolved considerably and is discussed elsewhere in the report as a vital set of experiences from which low-carbon work should proceed. The earlier history nevertheless provides some important lessons and identifies some of the potential strengths and weaknesses in the local government approach to climate change.

Introduction

ICLEI is an association of local governments, currently numbering over three-hundred. It was launched in 1990 as an international environmental agency for local governments, under the remit of the United Nations Environment Programme, the International Union of Local Authorities (IULA), and the Center for Innovative Diplomacy. The *Cities for Climate Protection* programme was launched by ICLEI in 1993 (termed the Councils for Climate Protection in the UK), following a successful scheme involving fourteen European and North American cities, the *Urban CO₂ Project*. ICLEI's original aim was to recruit cities world-wide whose greenhouse gas emissions represent 10% of the global total. Each participant agrees to undertake a five-stage process, from assessing and monitoring emissions, to the implementation of measures to reduce them (Table 1).

Table 1: Milestones of the CCP programme (from ICLEI 1997, pp13-14)

Milestone	Description
1. Conduct an energy and emissions inventory	Profile of municipal and community energy use and CO2 emissions
2. Estimate an energy and emissions forecast	Usually until 2010 or 2015
3. Establish a reduction target	To foster political will and to create a framework for planning
4. Develop and obtain approval for a local plan	Analysis, rationale for action, policies and measures to achieve target
5. Implement policies and measures	This may also serve as the first step, before formal analysis is undertaken.

In 1997, the programme had attracted two hundred participants, representing almost a hundred million people and almost 5% of global emissions; in February 2002 this had reached over 500. Recently, the CCP has changed focus from recruiting single local authorities to its network, to launching national campaigns. One such initiative was launched in the UK in July 2000, in conjunction with the Improvement and Development Agency and the Department of Environment, Transport and the Regions, in the form of a pilot based on CCP, the *Councils for Climate Protection* programme. However, before this campaign was launched, eleven local authorities in the UK had joined the CCP programme, and this paper summarises some of the key findings of researchⁱ which analysed their experiences of the programme and its impact on local policy making on climate change.

This research was conducted in two phases. The first involved a telephone interview with a representative⁴⁴ from each local authority listed by ICLEI as involved with the programme. The second involved in-depth research with three councils (Newcastle, Leicester, Cambridgeshire) in order to examine the impact of the programme in specific places. These findings are primarily drawn from the first stage of the research.

Key findings

- ◆ **There was a lack of active involvement across the council with the programme and it has a low priority. Its presence is usually due to the interest of one or two officers, and the programme falls by the wayside if these people leave.**
- ◆ **The motivation for joining the programme is to consolidate existing initiatives, rather than to develop new programmes or projects. In most councils, the milestones were not followed in a rigorous way.**
- ◆ Interviewees found it difficult to separate the influence of the programme from other influences which had led to energy conservation projects.

⁴⁴ Potential interviewees were initially selected on the basis of a list provided by ICLEI's European office of CCP contacts. In some cases the author was re-directed to other members of the local authority, either because of personnel changes or because it was felt that they could more suitably answer the questions.

Projects which have been put in place are usually in-house energy conservation, motivated by financial as well as environmental considerations.

- ◆ The technical side of the programme, creating an emissions inventory and forecast, was seen by the majority of interviewees to be a difficult task, given lack of access to data and the complexity of such calculations.
- ◆ Benefits of involvement with the programme included access to best practice ideas, either as suggestions for action or as a source of inspiration, giving a sense of broader purpose to local action, and as a useful lever for getting commitment in the Council on climate change.
- ◆ Problems cited with the programme included its lack of profile in, and connection to, other environmental policy initiatives within the UK. Some felt that the programme was “disconnected”, “ephemeral”, and “not specific enough” for the UK context. Others suggested that it was too technical, and time and resources could be absorbed calculating numbers and not taking action, or that there wasn’t sufficient feedback included as to how the programme was progressing.
- ◆ Of those councils involved with the programme, the majority felt that it could be improved by making it more relevant to the UK context and by raising the profile of the programme within other local and national environmental policy initiatives.

Discussion

Rationale for involvement

When discussing the reasons for joining the CCP programme officers articulated three main arguments, though these were not always distinct. First, that individual officers and/or members were interested in the issue of addressing climate change and encouraged the council to sign up to the programme. Second, individuals wanted to use the programme as a lever for further action within the council. Third, the programme was seen to provide a framework and rationale for actions which were already being undertaken or strategies which were being developed

For two of the council officers interviewed, in Birmingham and Leicester, these arguments still carried weight and provided a rationale for continued involvement with the programme. For others, member and officer interest had declined or the individuals concerned had left, and they struggled to find reasons for continued involvement in the programme, suggesting that in effect this involvement was in ‘name only’. In this context, it is hardly surprising that the milestone framework of the CCP programme has not been rigorously followed. Indeed, many local authorities found the technical side of the programme too demanding, and those which had completed an inventory and forecast had done so with the help of an external body, usually a local University. The finding that “CCP participants usually set and adopt a target and timetable only after careful deliberation involving a thorough analysis of local energy use and emissions” (ICLEI 1997, p.15) does not seem to apply to the UK where targets

have been chosen either as a symbolic commitment to action or on the basis of other initiatives.

Benefits from the programme

When discussing the benefits which they had received from the programme, interviewees suggested that these included:

- ◆ Tangible benefits: access to EU funding and networks (Newcastle and Leicester)
- ◆ Intangible benefits: sense of common purpose with other local governments; exchange of ideas; exposure to 'best practice' taking place elsewhere.

Shortcomings of the programme

In summary, these were seen to be:

- ◆ Technically demanding nature of the programme, problems with access to local data
- ◆ The lack of access to networking events, such as conferences and seminars, because of the time and financial resources they demanding, and their perceived lack of relevance to the UK context.
- ◆ Best practice ideas acted as source of inspiration, but lack of relevance to the UK context meant that they were irrelevant to day to day practice.
- ◆ The programme had a lack of statutory weight or political relevance/support.

Summary

During the period 1993-1999, the CCP programme did not, on its own, create new initiatives, actions or strategies, though its role in inspiring and informing officers and members is harder to assess. In some local authorities, its function has been symbolic, a banner under which people and strategies have gathered. For others who have become involved in the nitty-gritty of calculating inventories and forecasts, it has acted as a framework through which to capture local contributions to a global problem. However, in each case, officers found that the programme was not sufficient to overcome barriers to collecting information and taking action, and that it was too technically demanding, insensitive to local experience and politically disengaged, to be of much value.

Analysis of Strengths

- Adoption of a medium to long-term perspective
- Ambitious, but realistic, objectives

Analysis of Weaknesses

- Connections between the initiative and other decarbonisation initiatives at the national scale in the UK are lacking (though this is now being tackled through the new CCP programme)
- Lack of community, organisational and institutional commitment and backing
- Lack of relevance to the UK context, in terms of the powers and capacities of local government, diminishes effectiveness of networking and best practice exchanges
- Data driven programme makes it 'top-down', rather than 'bottom up'. Could be hard to win community support without careful implementation.

- Programme has appearance, if not intention, of being linear – that emissions reductions should be made on the basis of data analysis. When the first stage proves difficult, the programme grinds to a halt. This is true of the current UK pilot as well as the pre-2000 stage of CCP.

Opportunities

- Analysis of, and strategies for, the *transition* to decarbonisation
- Potential for social and policy learning and sharing
- Ancillary benefits with respect to other (non climate change) policies and initiatives
- Consistency with social, economic and resource productivity dimensions of sustainability

Threats

- Lack of community, organisational and institutional capacity to deliver
- Availability of sufficient resources

Conclusion: prospects

ICLEI's switch from recruiting single local authorities to creating nationally focused campaigns indicates that they think that this approach does not work for more than the most committed, and connected, councils. The new Councils for Climate Protection pilot project has addressed two of the criticisms raised by current participants; that the creation of inventories and forecasts is too complex for a local authority to undertake on its own; and that ideas of best practice and opportunities for networking need to be more locally relevant if they are to work. Its prospects, however, depend on addressing a further four issues.

First is the issue of data. While the new programme offers a means through which to create an inventory and forecast, it is not clear where the data will come from, and how it will be made locally relevant. Rather than readjust figures in line with the "audit approach", which currently seems to dominate discourses of sustainable cities, these problems should raise questions about its usefulness (see Gibbs 1999, Guy and Marvin 1999). A second and related point, is the tension between the "bottom-up" approaches – LA21 and community plans – suggested as a means to address climate change and the "top-down", data driven, CCP. Bringing people on board, to consider climate strategies for their local areas, will be no easy task. Further, there is no guarantee that the outcomes of such processes will be 'optimal' for reducing emissions. Difficult decisions will need to be made, and appropriate means for involving local communities in thinking about climate change mitigation and impacts need to be developed. Third is the idea of best practice. There needs to be further attention paid to the factors and processes which make a practice "best", and how far it can be translated from one place to another. This will entail a shift away from the premise that providing information about how things could be done better will in fact lead to change, to a more

concerted focus on the institutional barriers to adopting practices which are better, or even “best”, in particular places.

Finally, is the issue of power and responsibility. The past and current actions of local government show that significant potential exists for voluntary action to reduce emissions of greenhouse gases, though this primarily has occurred where there are ready monetary savings to be made. In order to tap into other win-win actions, and to address those issues where there may be some (financial) losers, the powers of local government, and their resources to act, need to be reconsidered. Some of these changes are occurring, and it will be interesting to see how far, for example, the development of local transport plans takes greenhouse gas emissions into consideration, but there is still a long way to go. These research findings show that if local government is to take meaningful action, it must be on the basis of political will at local and national levels.

The On-Going CCP Pilot

It is too early to comment in detail about the more recent experience of the on-going CCP pilot. A report published in November 2001 noted that of the 24 pilot authorities, 12 had collected some data but that significant gaps remained.⁴⁵ A further 5 authorities had collected most of the data required, whilst 2 authorities had collected all the greenhouse gas emissions data. Approximately 4 authorities had not progressed significantly. The report noted that most local authorities had found the software to be user friendly but had encountered problems in acquiring the necessary data or had not had sufficient staff to allocate to the inventory task. A few authorities had obtained bottom-up data on electricity consumption, whereas many were forced to rely upon pro-rata data scaled down from the national scale.

3.4. Local Authorities and Climate Protection in the UK:

Potential and Problems in Newcastle, Leicester and Cambridgeshire

By examining how far principles of climate protection have been integrated into policy practice and the development of specific programmes and projects a picture of the problems and possibilities facing local action to mitigate climate change can be seen. With this in mind, this section examines three sectors of local government action – land use planning, transport planning and energy management in the built environment. It argues that while local authorities can, and in fact must, be involved in measures to mitigate climate change, their impact to date has been limited by a lack of resources and powers to act, and by conflicts between economic and environmental goals. These issues need to be addressed urgently in order to tackle long-term reduction of carbon emissions in the UK. The case-study authorities we examine are all leading-edge when it comes to low-carbon initiatives. They

⁴⁵ Allman, L. et al., 2001

have all achieved impressive policy and programme development, well beyond the norm. It is therefore even more significant to analyse why these authorities have not generally been able to achieve as much as they originally intended.

3.4.1. Low-Carbon Planning? : A Case-Study of Newcastle-upon-Tyne City Council

Over the past three decades, Newcastle City Council has been involved in many different projects which have sought to address the economic, social and environmental costs of energy use. In 1989, the City Council were successful in their bid for European funding under the CITIES programme to conduct research into the use of energy within the city, both within the

the built environment and the transport sector. The motivation for this study, *Energy and the*

Box 1: The *Energy and the Urban Environment* study

On the basis of data gathered from within the local authority and from utility companies, a model of the use of energy within the Newcastle, both within the built environment and in transportation, and its related emissions of carbon dioxide was constructed. This model was then used to develop two alternative scenarios: the “business as usual” case; and the “new policy initiatives” case where policy intervention was used to redirect the creation and use of energy in four areas – CHP, energy efficiency, transport and renewables (NCC 1992). From these scenarios, a target of reducing emissions of carbon dioxide by **45% of 1990 levels by 2010** was suggested, and an action plan containing various measures to reach this goal was created and endorsed by the Council. A five year review of the *Energy and the Urban Environment* study conducted in 1995, showed that progress towards the ‘new policy initiatives’ scenario, and its ambitious target, had been difficult (NCC 1997). Emissions levels were seen to be constant over the period, with any savings on projected increases more the result of a national trend away from the use of coal to gas, than a direct result of the implementation of local strategies and measures.

*Urban Environment*⁴⁶, included the recognition that cities contributed to, and should aim to manage, emissions of carbon dioxide from within their boundaries (see Box 1). The study showed that planning would have a significant role to play if reductions in energy use from transport and the provision of alternative energy supply, such as renewables, district heating and combined heat and power, were to be forthcoming.

These conclusions were further developed in Newcastle’s *Unitary Development Plan* (UDP). The UDP suggests that reductions of emissions of carbon dioxide by 30% of 1990 levels by 2010 are achievable through “proposals that can be assisted by land use and transportation planning”⁴⁷. To this end, two types of policies are included within the UDP: those which attempt to reduce the use of energy through shaping the urban form, such as reducing the need to travel; and those which address energy use through design, for example through the use of energy efficiency standards and renewable energy measures⁴⁸. These two approaches are discussed in turn.

That the planning system should take into account the energy implications of the form and placement of new development is articulated in various guidance documents produced by central government, including Planning Policy Guidance (PPG) 12 on development plans, PPG13 on transport, and PPG3 on housing. Development should be planned, it is argued, in such a

⁴⁶ NCC 1992

⁴⁷ NCC 1998: 44

⁴⁸ NCC 1998: 44-45

way so as to reduce the need to travel; this can be achieved through, amongst other means, the re-development of brownfield land in inner-city locations, increased density, planning for mixed-use developments, and placing development near existing public transport links. For example, PPG3 suggests that 60% of all new housing development should take place on brownfield sites, and includes new recommendations for the density of housing developments and upper limits on the amount of car parking spaces provided per household⁴⁹.

In response to the development of government guidance and their own work on the relations between energy use and the built environment, Newcastle's UDP contains policies to place development where it is easily accessible by alternative modes of transport and re-use brownfield land⁵⁰. However, it is also clear that the primary purpose of the UDP is to attract new investment and economic growth to the city, and to stabilise declining population levels. In order to do this, it is argued that Newcastle must make the appropriate number and type of sites available, including greenfield areas, for housing and economic development⁵¹. Since the adoption of the UDP, NCC has pursued two strategies for regeneration. First, the development of a greenfield site, 'Newcastle Great Park', as a high-tech business park and residential area. Second, the *Going for Growth* strategy which aims to redevelop inner city locations for housing. There is some tension between these two strategies and the need for greenfield redevelopment was questioned on the basis that sufficient inner city brownfield land could be found to meet housing projections. NCC has sought to link the two together through a 'joint housing' initiative, and to improve the sustainability criteria of the NGP site (see Box 2). However, it remains to be seen whether this attempt to reduce energy use

within the city has been successful. Some commentators warn against equating reducing the *need* to travel with reducing the *inclination* to do so, arguing that the ability of the planning system to affect transport decisions made by individuals is only partial, and relies on an integrated approach in which, for example, economic instruments and information are also used to manage demand.⁵² Restricting development in cities or towns may also have the unintended consequence of increasing property prices, so effectively outpricing lower-cost residential developments, which then get displaced beyond the local authority's boundary, increasing travel demand.⁵³ The problems and prospects for delivering integrated local transport strategies is considered in detail below.

The other means through which the planning system is seen to be able to affect energy use and subsequent emissions of carbon dioxide is through the design of developments and

⁴⁹ DETR 2000a

⁵⁰ NCC 1998

⁵¹ UDP pages

⁵² Banister et al. 1997; Owens 1992

⁵³ Breheny

individual buildings. While standards of design are controlled by national building regulations, development plans can also include guidance on energy efficiency and renewable energy measures for individual buildings, and for the layout of developments. The *Unitary Development Plan* suggests, amongst other measures, that developers look to improve the energy efficiency rating of new buildings above national standards, incorporate passive solar design, and include renewable energy or Combined Heat and Power within projects.⁵⁴ In addition, supplementary guidance notes for development control procedures which encourage energy efficiency have been developed.⁵⁵

In practice, these criteria have primarily been implemented either where the Council owns the land which is to be developed, or where developers are eager to gain access to particular sites and avoid delays in the planning system. One example of the first case is the Ouseburn Valley in the east end of Newcastle, where the City Council has written a development brief which includes consideration of energy efficiency and the provision of alternative modes of transport, and has evaluated the development bids on this basis before considering costs. This means that sustainability criteria are given significant weight (though it may reduce the revenue from the sale of land). even in this situation some officers and members felt sufficient pressure had not been brought to bear, and that the measures to address energy use were. The second case, where the developers are keen to gain access to particularly valuable sites, is most evident at Newcastle Great Park. However, these instances are few and far between, and in general, local government officers felt that it was difficult given their current powers through the planning system to address the issue of climate change. While the strategic

Box 2 - Energy and sustainability: Newcastle Great Park

NCC justified the development of the greenfield site in terms of its potential contribution to sustainable development and a reduction in energy use in the city:

- ◆ Reduction of commuter travel vs. out of town locations where high-income earners currently seek housing
- ◆ Mixed use location of business, residential and services could reduce need to travel
- ◆ High standards of energy efficiency required in design; public transport links to city centre
- ◆ “Joint Venture 2-for-1 Housing Agreement” (DETR 2000b), for every new home built in the Newcastle Great Park, two must be constructed on inner city brownfield sites

process of creating a ‘development plan’ has embraced the vision of addressing climate change, bringing these criteria to bear in development control decisions was seen to be much more difficult.

In short, while the concepts of material consideration and planning obligation allow for development control decisions to take wider environmental issues into account, whether or not (or to what degree) such interpretations will be upheld in practice is moot. Planners argued that it was only in the rare cases where the Council owned the land or where development pressure was strong that planning obligations to this end could be negotiated. Furthermore, the negotiation of one type of planning obligation was, to some extent, to be at the expense of another, so that energy efficiency would have to be traded against public transport and improved social facilities. Planners felt that interpretations of material considerations in such a way that a development application could be refused on grounds of its contribution to emissions of

⁵⁴ NCC 1998: 44-45).

⁵⁵ NCC 2000

greenhouse gases would be untenable without increased specific guidance from central government on the weight such consideration should have in relation to other issues, and would risk the Council being fined by the planning inspector. As one Planning Officer put it:

To an extent the local authorities have got to be in a position to drive [the inclusion of energy considerations]. And it's not necessarily going to be popular. And you are not going to be able to do it every time. At the moment you certainly can't refuse planning permission on the basis that the design is all right but there is no sustainability dimension. ... if that became then a reasonable reason for refusal, that would be a step. But I can't see it at the moment, in the short term. But in the longer term, if the central government is serious about LA21and if it then ...says ...to local planning authority, you can refuse a development on a site if it doesn't meet certain minimum criteria. ...if that was the case ... that really would strengthen the local government's arm, because you would be able to turn things down, and not be frightened that it was going to come to a public enquiry.

Interview, Planning Officer, Newcastle City Council, 2000

For some commentators, the lack of action on sustainable development, including energy, is due to a lack of awareness about both the issues involved and the means through which the planning system could address them.⁵⁶ However, the vast majority of commentators see the problems as more deeply rooted, involving the lack of resources and powers held by local planning authorities, and shifts in their roles away from regulation towards negotiation in line with changes in local governance. Moreover, the planning system is geared towards control or prevention, rather than proactive planning in which some forms of development can be promoted over others. Despite changes to government guidance, the planning system remains concerned primarily with the immediate impacts of land-use, and concerns for wider and cross-boundary environmental issues are only slowly making headway.

In essence, the barriers to addressing climate change through the planning system (see Box 3) can be considered in two categories. The first concerns the powers of local planning to address energy and climate change issues. The guidance contained within the UDP is “soft”, recommending that developers should be *encouraged* rather than *required* to take action with respect to energy use through the location or design of development. This is as a result of planning legislation which does not give considerations of sustainability statutory weight, so that development applications can not be refused on such grounds. In some cases, the ground on these issues has shifted. Where this is the case, three reasons can be identified: first, shifts in central government guidance, for example on issues of transport and brownfield development; second, additional leverage held by local government through their ownership

of the land; third, willingness on the part of developers to address sustainable development criteria in return for the perceived benefits of the development site.

<p>Box 3 - Problems encountered in planning for climate change¹</p> <ul style="list-style-type: none"> ◆ Dependence for knowledge and interest in energy as an issue on a few individuals ◆ Energy not considered as legitimate grounds for refusal of development proposal ◆ Negotiating planning obligations on energy criteria is difficult ◆ Conflicts amongst different end uses for planning obligations ◆ Potential loss of revenue from land sales where sustainability criteria are included ◆ Lack of clear government guidance on role of planning in energy policy ◆ Lack of interest in development industry in addressing energy issues ◆ Concern over driving developers away if criteria are too stringent ◆ Conflict between development priorities and sustainability

The second relates to the priority placed on sustainable development in general, and energy use and climate change in particular, by actors in the planning system: officers, members, developers and central government. The rationale for development in Newcastle turns on issues of securing economic growth, stabilising population decline and meeting housing demand. In an area of high unemployment and considerable levels of social deprivation, environmental constraints on growth have not figured highly in local debates. Furthermore, the perception within the development areas of the City Council appears to be that the goals of economic growth and environmental protection are not readily reconcilable. The challenge for the new environmental agenda in planning is, as Healy and Shaw argue, therefore "not simply one of developing appropriate conceptions, policy instruments and skills in local operationalization. It is a political challenge for real leverage over economic discourse – at the level of policy and practice".⁵⁷

Analysis

In considering the strengths, weaknesses, opportunities and threats to addressing climate change through the planning system in Newcastle, the following points, which were also found to be applicable in the other two case-studies considered (Cambridgeshire and Leicester), can be made:

Strengths

- Ambitious goals (e.g. CO₂ reduction targets)
- Adoption of a medium to long-term perspective
- Integrated approach: from individual houses, to neighbourhood and city scale
- Includes strategies/policies for a transition to decarbonisation

Weaknesses

- Level of institutional commitment varies across the local authority
- Lack of government guidance on the relative importance of sustainability criteria vs. other criteria in the planning system
- Lack of capacity to enact policy objectives
- Lack of resources to enact policy objectives
- Lack of community/stakeholder involvement in setting targets
- Focus is on 'new build' rather than existing housing, limiting impact

Opportunities

- Central government guidance and action with respect to climate change criteria in planning decisions could be improved through clarifying the respective weight of these considerations vs. others in the planning process
- Potential for long-term, robust framework for integrating climate protection into land use planning
- Potential to affect majority of newly built environment
- Ancillary benefits with respect to other (non climate change) policies and initiatives, such as local transport policy, air quality and regeneration

Threats

- Assumed synergy between economic, social and environmental goals of sustainability is not immediately obvious in this case: hence there is a need to explicitly consider how social and economic goals can be integrated with reduction in local emissions of greenhouse gases

⁵⁷ Healey & Shaw 1994: 434

3.4.2. Low-Carbon Transportation? A Case-Study of Cambridgeshire County Council

In the late 1980s, Cambridgeshire abandoned its road building programme in the face of local protests and the growing realisation that forecasted levels of traffic growth could not be accommodated. Since that time the Council has adopted a new approach to local transport planning which has included: an acknowledgement of the need to take account of the broad social, economic and environmental issues which local transport planning influences; an emphasis on widening travel choice and managing demand; and the inclusion of a range of 'soft' technologies through which to implement change.⁵⁸ The Cambridge sub-region is a prime example of an area where demand management is most likely to be accepted because a "climate of desperation" concerning the local transport situation has arisen and/or where previous attempts at addressing such problems through increasing capacity have failed.⁵⁹ However, in other parts of the County, the argument is made that *more* transport infrastructure is necessary to promote development.

Marvin and Guy⁶⁰ identify three kinds of demand management strategy: "persuasive" whereby information is provided to the public in order to promote behaviour change; "soft", where, in partnership with other organisations, authorities seek to negotiate improvements in public transport and encourage voluntary action; and "hard", where physical or economic restrictions are placed on the use of private vehicles, ranging from the reallocation of road space to car parking charges and road use levies. Land use planning policies to reduce the need to travel fall between these categories in that their purpose is to change the physical structure of cities, but with promotional rather than restrictive purpose. Attempts to manage demand through encouraging modal shift; restricting access and reallocating road space; and the use of economic instruments are discussed in this case-study. It is argued that, while demand management measures have been put in place in Cambridge, these remain weak and the emphasis in the rest of the county lies in meeting greater demand.

Box 4 - Park and Ride: a success story?

Capital investment in five Park and Ride sites on the outskirts of Cambridge and improvements to bus access along priority routes of over 7m has been made by the County Council. Buses are operated under a 'quality partnership' with Stagecoach. In 2000, over 1m passengers were using the scheme, an increase of almost 0.5m over five years. In addition, the Council has used the development of Park and Ride as justification for increasing parking charges within the city and restricting access by motor vehicles during the day.

Critics argue that the Park and Ride scheme has increased the capacity of the city centre, but has not reduced absolute levels of traffic. The Council's monitoring report suggests that traffic into the city centre is falling slightly, but across Cambridge remains constant. Another criticism is that Park and Ride could be encouraging people to drive further to reach Park and Ride sites rather than use existing bus routes. Finally, existing facilities are at capacity during peak hour, suggesting that the scheme will only work as a temporary respite from increasing levels of traffic growth

Modal shift?

In Cambridgeshire, attempts to produce a modal shift in transport choices away from the car and to public transport, cycling and walking, have included

a combination of traditional infrastructure development, and persuasive and soft forms of demand management. Since the deregulation of local bus transport in the mid-1980s, local authorities have few powers through which they can directly influence the delivery of public transport systems. Instead, the focus is on indirect measures, such as infrastructure development, including the development of park and ride sites and bus priority lanes, which in turn local authorities hope will lead to the provision of better services (see Box 4). Measures to encourage the use of other alternative modes of transport have likewise focused on the provision of infrastructure, such as additional kilometres of cycle track or pavement repairs.

In addition to infrastructure improvements, the main focus of Council policy to promote modal shifts has been on the provision of information about travel choices.⁶¹ An example is the “Safe Routes to School” programme⁶², which seeks to make improvements to road design as well as provide encouragement for the use of alternative modes of transport.⁶³ The Council has also introduced the “Travelwise” Campaign, which aims to provide information about travel choices to the public⁶⁴, and the “Travel for Work” initiative, which has a broad remit to promote alternative modes of transport through behavioural and infrastructure change within workplaces, such as the introduction of green travel plans. However, these measures are given less financial support than those which focus on the provision of “hard” infrastructure. In fact, such approaches have been reinforced by recent Government guidance which stresses that targets and performance indicators which are readily measurable and for which the local authority can be held to account should be included within Local Transport Plans. In this context, soft and persuasive approaches to demand management, which are less straightforward to account for, may be neglected.

Restricting access and reallocating road space

The second element of demand management policies have been measures to impose physical restrictions on the use of the city centre by cars, through pedestrianisation and limiting access to surrounding roads. In Cambridgeshire this has involved the development of the ‘core scheme’ in Cambridge, whereby rising bollards are used to restrict access to the city centre to essential traffic during the middle of the day, to the prioritisation of pedestrians over cyclists in the centre of the city. Other attempts to re-allocate road space, away from vehicle traffic to buses, cyclists and pedestrians, have also been made with the extension of bus priority lanes and cycleways, effectively aiming to manage demand by reducing the road space allocated to cars. However, such measures tend to be piecemeal, and fitted in around existing road infrastructure in places where an unacceptable level of disruption can be avoided. The extent to which they challenge the traditional priority afforded to car transport is therefore questionable.

⁶¹ CCC 1998:88

⁶² It should be noted that this programme does in its own way perpetuate the focus on road infrastructure, albeit through safety improvements in the form of traffic calming, cycle lanes, priority junctions. Although, as Marvin and Guy suggest (1999a: 145), this represents a considerable break with large-scale infrastructure projects designed to increase vehicle speed and efficiency, there is a continued faith in the ability of changes in infrastructure to bring about behavioural changes. The extent to which soft and persuasive measures are included to change behaviour – such as “walking trains” or education campaigns – is not clear from policy documents.

⁶³ CCC 1998: 72-3

⁶⁴ CCC 1997: 53

Economic incentives

During the 1990s, the Council has increased parking charges in the city of Cambridge, though this has been intended more as a revenue raising exercise for other schemes than as a means of deterring car travel. In 1993, the Council were also the first local authority in the UK to pilot a system of congestion charging. However, the scheme failed to survive beyond the pilot phase because of a combination of technical problems and a lack of political support, especially after the retirement of its political champion.⁶⁵ The issue of using economic instruments to manage demand has recently resurfaced with enabling legislation in the Transport Bill 2000 for local authorities to implement road user charging and workplace levies. In each case, the local authority would be free to design and implement the scheme, and to collect any revenue raised, provided it is used to fund local transport improvements. However, Government guidance makes it clear that, should a local authority wish to pursue its new powers, it will have to ensure that alternatives are in place first.⁶⁶

Given their previous experience, the Council has decided not to consider road user charging at the present time, but has made a commitment to examine the possibility of introducing workplace levies in Cambridge city. Even at this early stage in the consideration of such a scheme, both practical and political problems have arisen. On the pragmatic side, the first problem concerns the issues surrounding the implementation of a scheme, such as identifying parking spaces, setting the boundaries within which charges would apply, and securing long-term security for the scheme in the face of political changes at local and national levels. A second difficulty concerns the timing of the implementation of workplace charging. While central government and local authorities have made it clear that alternatives have to be in place before such 'hard' demand management measures are introduced, it is not clear that the former will be successful without some form of disincentive for car use in place. The question also arises as to whether sufficient capital and revenue will be available to fund such 'alternatives' without the promise of finance provided by workplace/road-user charging. The recent *Ten Year Plan* financial settlement for the transport sector has been generous to local authorities.⁶⁷ However, concerns have been raised about the long-term future of such levels of funding, changes to local authority financing which will centralise funding and may lead to the neglect of transport spending, and the extent to which sufficient revenue will be available within local authorities to make the most out of their capital spending.⁶⁸ What is more, the generosity of such funding could reduce enthusiasm on the part of local authorities for the workplace charging, one of the main benefits of which was seen to be additional funding.

⁶⁵ Ison 1998

⁶⁶ DETR 2000d: 33

⁶⁷ DETR 2001

⁶⁸ Wootton and Marsden 2001, CfIT 1999b

The need to have alternatives in place before implementing charging, but limited means to do so and questions over the effectiveness of 'soft' and 'persuasive' demand management without 'hard' measures in place, has been recognised within the Council. However, the perception is that workplace charging is currently 'too much, too soon'. This reflects the political problems with which the implementation of such a scheme is faced. Although in Cambridgeshire a political consensus over the need to manage demand, and the potential of economic instruments to this end, has emerged, cracks still appear along party lines about the acceptability of workplace charging as a result of conflict between rural and urban constituencies. The opposition parties – Labour and the Liberal Democrats – need to secure rural seats to win a majority, and are reluctant to come out strongly in favour of workplace charging for fear of alienating the 'commuting' voter. Likewise, the ruling Conservative party wishes to retain the loyalty of these voters. This confirms Enoch and Potter's analysis that, in terms of local government's new powers to implement 'hard' economic measures for demand management, "signs of very cold feet are emerging from most town halls".⁶⁹

Meeting demand?

The tension between managing and meeting demand is clear in the approach adopted in Cambridgeshire to the mandatory requirement to set road traffic reduction targets, in line with the 1997 Road Traffic Reduction Act. While the Government makes it clear that local government is free to set, or not to set, a target, each authority must prepare a report and explain their choice of targets. In their report, Cambridgeshire County Council make it clear that reducing traffic growth is not a strategy which they think is either desirable or possible:

Cambridgeshire is experiencing two contrasting development pressures, neither of which makes the County obviously suitable for the two types of traffic reduction targets as identified under the Act. These types are an absolute reduction and a reduction in the rate of traffic growth. The positive development pressures on the Cambridge sub-region would make even a reduction in the rate of growth an unrealistic target in many instances. For other parts of the County, much of which is underdeveloped fen land, there are policies in place aimed at encouraging development. Much of that development will have to be road based and, again for completely opposing reasons, setting traffic reduction targets is not realistic.

Cambridgeshire County Council 2000d, p. xxv

In the light of this assessment, the Council proposes various targets which aim to stabilise traffic volumes in Cambridge and its surrounding area and the market towns, and to reduce traffic in the city centre by 1.3 per cent per year over the next five years. This reflects current trends in traffic in the Cambridge sub-region. In order to reach these targets whilst also accommodating the "desire or need for travel that always appears to accompany economic growth", the Council suggests that an increased modal shift away from the car will be needed.⁷⁰ This choice of road traffic reduction targets reflects Government guidance that targets should not be 'aspirational', should be tied to measures implemented by the local

⁶⁹ Enoch & Potter 2000: 256

⁷⁰ CCC 2000d: xxvi

authority and should be measurable.⁷¹ It also reflects recent shifts in thinking by central government, away from reducing traffic growth to reducing the impacts of traffic. Underlying both local and national policy is the assumption that traffic growth and economic growth are inextricably linked. While recent research challenges such assumptions, suggesting that for any given rate of economic growth a variety of traffic levels are possible, this has yet to permeate policy thinking.⁷²

<p>Box 5 - Problems in putting demand management measures into practice in local transport policy</p> <ul style="list-style-type: none"> ◆ Lack of direct powers to improve public transport provision ◆ Lack of resources, in particular for non-capital projects ◆ Dependency on voluntary action by individuals and businesses to achieve modal shift and demand management ◆ Continuity of infrastructure provision approach, other measures sidelined ◆ Need to 'account' for impact of measures means that those with less direct or immediate effects are sidelined ◆ Practical and political problems in implementing 'hard' demand management measures ◆ Assumption of positive link between traffic growth and economic growth persists
--

This approach to road traffic reduction raises significant questions about the impact of local transport policies on traffic growth, and the strength and efficacy of policies of demand management. Furthermore, the adoption of such targets suggests that the 'traffic problem' is considered to be localised. Although

traffic reduction on commuter routes and in the city centre may have the impact of reducing congestion and local air pollution, it will have little impact on reducing overall levels of traffic or rates of traffic growth, and therefore on the wider impacts of transport - including emissions of greenhouse gases and the consequent problem of climate change. This is acknowledged by policy-makers in the adoption of a target to reduce emissions of greenhouse gases by 12% below 1990 levels by 2010 as an indicator of the success of the Local Transport Plan, rather than the more ambitious 30% below 1990 levels by 2005 which remains an official target of the County Council.⁷³ Although the link between increased traffic growth and climate change has been explicitly recognised within Cambridgeshire, local action to address emissions from this sector have been constrained by a focus on infrastructure provision, the limited powers of local government to achieve change through soft and persuasive measures and a reluctance, at local and national levels, to engage with hard demand management (see Box 5).

Analysis

In considering the strengths, weaknesses, opportunities and threats to addressing climate change through the local transport planning in Cambridgeshire, the following points, which were also found to be applicable in the other two case-studies considered (Newcastle and Leicester), can be made:

Strengths

- Adoption of a medium to long-term perspective
- Strategies are (implicitly) for the transition to decarbonisation, rather than achievement of a particular goal

⁷¹ DETR 2000d: 83
⁷² Owens and Cowell 2002
⁷³ CCC 2000d, pp176-177

- Community and stakeholder support for addressing ‘transport crisis’ in Cambridge
- Ancillary benefits with respect to other (non climate change) policies and initiatives, such as congestion, air pollution, health, and urban ‘liveability’
- Currently a relatively high level of resources given for capital projects

Weaknesses

- Target for carbon dioxide emissions reductions is arguably low: 12% below 1990 levels by 2010; and the monitoring of progress towards this target has yet to be institutionalised.
- Lack of influence of local authority over public transport provision and travel choice behaviour: dependent on voluntary action by individuals and co-operation by transport providers
- Emphasis on ‘countable’ measures leads to traditional approaches – infrastructure provision and information – while more innovative, effective but less readily measured approaches are neglected.
- Lack of resources to support non-capital projects
- Lack of community, stakeholder, local or national political support for ‘hard’ demand management measures without alternatives in place. Alternatives to car travel are only likely to be effective with hard demand management measures. A ‘chicken and egg’ situation.

Opportunities

- Offers possibility of an integrated approach to reducing significant amounts of greenhouse gases over the medium to long term

Threats

- Uncertainty about the resources available over the medium to long term
- Continued belief in the necessary link between economic growth and traffic growth; suggests that measures to reduce the level of traffic growth will not be taken.

3.4.3. Low-Carbon Energy Management? A Case-Study of Leicester City Council

Leicester City Council has long been considered a frontrunner in local environmental policy. Since the 1970s, the Council has been concerned with developing open space within the city, enhancing habitats for urban wildlife, promoting energy efficiency and the development of renewable energy.⁷⁴ In 1990, Leicester was designated the first ‘Environment City’ within the UK, and an *Energy Action Plan* was launched. This set Leicester the ambitious target of reducing "the consumption of non renewable sources of energy and carbon dioxide emissions to half of the 1990 levels by 2025", and suggested eighty actions across the energy supply and demand sectors which could be taken in order to address this target.⁷⁵ Through a stakeholder energy working group, and with funding from the European directorate for energy, the

⁷⁴ Roberts 2000: 10

⁷⁵ LCC 1996: 12

Leicester Energy Strategy was then developed. It assessed the measures that had been taken and those which would need to be implemented in order to meet the target of reducing energy and emissions of carbon dioxide from 1990 levels by 50 per cent by 2025.⁷⁶ This assessment was made in terms of energy supply and energy demand in the domestic, business, community and transport sectors.⁷⁷ Despite the comprehensive approach adopted, the Strategy recognised the limited influence of local government over energy supply, and policy has been directed towards issues of energy demand. The three main areas of policy which have since been addressed are: energy use within the built environment, through building design; energy management within the housing sector; and the in-house use of energy by the local authority.

Building design

Over the past decade, local planning guidance has included suggestions that energy measures should be given priority when considering planning applications for new developments.⁷⁸ However, as in the case of Newcastle, Leicester City Council has found it hard to bring this guidance to bear on particular developments. One area in which the council has been able to exert more influence is through the requirements it can make as a land owner. At a site on the periphery of the city, Ashton Green, next to the Beaumont Leys estate, a proposal was made in 1992 to create a sustainable settlement in which one key consideration was the use and conservation of energy.⁷⁹ This project has served two purposes for the Council. First, of "adding value" to an otherwise unattractive economic proposition, the development of land adjacent to a housing estate with a poor reputation. Second, it allowed certain officers and members to pursue their interest in sustainability, to lend further credentials to the Environment City and Local Agenda 21 initiatives, and to develop further partnerships in Europe. The project has received funding from the EU, notably under the DGXVII ALTENER II programme. However, progress has not been as fast as hoped for and there has been some internal conflict within the Council between the need to secure finances from the sale of the land on the one hand, and to take sustainability into account on the other. Whether the initial ambitions of this proposal will be realised remains to be seen.

Energy conservation in the housing sector

In 1993, Leicester established a *Home Energy Strategy* to address the use of energy within the domestic sector in the City, in order "to enable all households to have access to affordable warmth and a healthy home whilst reducing the use of non-renewable sources of energy and noxious emissions".⁸⁰ The Leicester Energy Strategy, and subsequent action under the remit of the *Home Energy Conservation Act* and by the Leicester Energy Advice Centre have built on this approach to increasing the energy efficiency of private and public housing. In brief, it encompasses two, related, strategies: first, improvements to the physical structure of existing buildings through insulation measures; and second, attempts to educate the public about the importance of energy conservation. This has been achieved through:

- ◆ Energy efficiency improvements to public sector housing.
- ◆ Incorporating energy efficiency measures in regeneration initiatives and in houses which receive renovation grants.

⁷⁶ LCC 1994: 9-10

⁷⁷ LCC 1994

⁷⁸ LCC et al. 2000, pp50-51

⁷⁹ Lindley and Fleming 2000; EDAW 2000, p.11

⁸⁰ LCC 1996: 12

The Energy Sense programme works at a number of levels, by providing information about the possibilities of energy conservation and by addressing the 'hassle factor' which people associate with building works. This approach addresses the criticism of recent research that providing information alone is unlikely to create behavioral change

- ◆ An Information pack on possible energy conservation measures and their economic and environmental paybacks is given to residents
- ◆ A free home energy survey and schedule of proposed works, with their costs, is available to individual households
- ◆ Recommendations on contractors and energy efficient products
- ◆ Negotiated rates from local contractors and guarantees for the supervision and completion of the work are available to residents
- ◆ A free 'home energy smart card' provides incentives for purchasing energy efficient goods and services
- ◆ Some grants are available to assist in the implementation of the alterations, but in the main finances have to be raised by the individual householder

- ◆ The provision of advice on energy conservation to individuals and businesses.

The public and private sector housing initiatives have been supported both by the City Council and through funding from external sources, such as the Energy Saving Trust (EST) and the European Union (EU). Given the small amount of public sector housing stock, and the limited opportunities for integrating energy efficiency measures into regeneration initiatives, information provision has been a key element of Leicester's energy conservation strategy in the domestic sector. This has been undertaken in several ways. First, through the Energy Efficiency Advice Centre and its shop, situated in the city centre, through which information about ways to reduce

energy use and various energy efficient devices are available. Second, through the work of the Energy Agency in promoting energy conservation among small and medium-sized enterprises. Third, through the 'Energy Sense' programme, run by the housing department (see Box 7). And finally, through joint initiatives with the local sustainability charity organisation, Environs, such as the 'Eco House' which demonstrates energy conservation technology, and a publicity campaign in the local media.

In a review conducted under the Council's Environmental Management and Audit Scheme (EMAS), progress over the year 1997-1998 was seen to have had led to more than one per cent improvement in energy efficiency and "CO₂ reduction as a result of measures identified and declared under HECA was 1.43%".⁸¹ Whether the overall HECA target of reducing emissions of carbon dioxide by 30 per cent of 1990 levels by 2005 will be met is, as for all local authorities, debatable. This does not mean that there is little room for action in this sector, but rather suggests that current levels of funding and opportunities to influence the energy conservation behaviour of individuals are low.

In-house energy management

Aside from addressing the energy efficiency problems of their own, limited, council housing stock, the City Council and energy management team have conducted a number of initiatives to address the issue of energy management within their own operations. These have included the installation of

⁸¹ LCC 1999

automatic switches for lighting, new heating systems, the provision of energy efficient appliances, procedures to ensure that contractors comply with energy efficiency requirements and the continuing provision of advice to Council staff on the use of energy.⁸² Recently, there has been increased interest in the potential use of renewable energy within the City, with measures underway to purchase renewable energy for Council buildings and to install renewable energy demonstration projects to supply Council property.

The development of EMAS within the City Council over the past four years has lent further weight to initiatives developed under the *Energy Action Programme*, the *Energy Strategy* and by the Energy Agency (see Table 1). The rationale for adopting EMAS relates both to a longstanding political commitment to corporate environmental responsibility, developed through *Environment City* and the LA21 process, and to the modernisation of local government agenda of the current Labour Government.

Table 1: EMAS objectives for energy use within Leicester City Council (LCC 1999)

Objectives	Targets
Reduce the council's total building energy consumption	1.1 Reduce to 50% of the 1990 level by 2025
Improve the energy rating of council houses	1.2 From 47% of council houses achieving less than 6 (NHER) in 1997 (March) to all council houses achieving 6 (NHER) by 2006
increase the council's use of renewable energy	1.3 From 0% of the energy requirement of council buildings in 1997 (March), to 20% of the energy requirement of all buildings by 2020
reduce staff commuting by car	1.4 10% reduction of the number of people coming to work by car in 1997 by 2000
reduce the fuel used by staff vehicles at work (not commuting)	1.5 5% reduction of the fuel used in 1997 by 2000
increase the use of bicycles at work (not commuting)	1.6 100% increase of 1997 levels by 2000 and 200% increase of 1997 levels by 2002

EMAS has helped to give a more transparent and rigorous means of assessing progress towards such targets, as well as raising the profile of energy issues within the Council. However, despite its best intentions, the EMAS process has faced some considerable hurdles, not least in addressing the use of energy within buildings formally controlled solely by the Council, such as schools and hospitals. Here the contradictions between different central and local government policies become all too apparent. On the one hand, the Government is directing local authorities to consider the environmental impacts of their service delivery and policy goals through "best value". On the other hand, successive waves of reform to local government have decentralised management of local government property and services, so that individual buildings manage their own budgets, the latest example of this being schools. This means that the benefits of scale in investing in energy efficiency measures are lost, and the council has little influence over energy management decisions in public services. Furthermore, new guidelines for benchmarking and comparing service delivery seem to neglect the sustainable development aspect written into "best value" in favour of more crude measures which focus on cost. Whether the Council can meet its internal EMAS targets for energy in this climate is unclear. Furthermore, questions remain as to whether such targets will detract from the more holistic, and comprehensive approach taken to energy in the early part of the 1990s, by focusing attention on that which can be controlled by local government

⁸² LCC 1994, LCC 1999

rather than those areas in which it has more indirect influence but which may be more significant in the longer-term.

Evaluation

There are several factors which account for Leicester's relative success in the implementation of energy policies devised over the past decade.

- ◆ Support from key officers and members, who have remained within the Council or within the policy area, for a holistic and comprehensive approach to energy.
- ◆ Access to additional funding sources: financial arrangements which allow the cost savings from energy efficiency to be reinvested; other local government initiatives, such as the housing renewal programme; other central government funds, such as City Challenge, the Single Regeneration Budget, and the Energy Saving Trust; and European Union programmes. This has enabled the Council to undertake measures to address energy issues over and above those which they would have been able to with normal funding arrangements.
- ◆ Initiatives to address energy conservation have been married to other agendas, such as social inclusion (fuel poverty), health, regeneration, and business efficiency.
- ◆ The success of Leicester with energy and environmental initiatives has been recognised internationally, which in turn strengthens local political support for initiatives and creates access to external sources of funding.
- ◆ Given these factors, Leicester City Council has been able to take advantage of changes in Government legislation, such as the HECA and "best value", to strengthen the legitimacy of their energy and environment policies by giving them significant weight within the local authority. This should mean that the policies and measures have some degree of longevity.

Even given the relative success of Leicester in addressing energy issues within the urban environment, it is not clear how far towards achieving the target of reducing energy

Box 8 - Problems putting energy management policy into practice

- ◆ Dependence for knowledge and interest in energy as an issue on a few individuals
- ◆ Lack of powers to influence energy efficiency/use across council buildings
- ◆ In-house focus on measures which produce cost savings in the (relatively) short-term
- ◆ Reliance on external funding to develop and implement measures
- ◆ Lack of resources/power to implement measures within the housing sector
- ◆ Lack of influence over energy use in the housing sector
- ◆ Competition between departments to deliver similar services
- ◆ Contradictions between different Council objectives

consumption and carbon dioxide emissions within Leicester by 50 per cent of 1990 levels by 2025 they have progressed. As suggested above, progress towards achieving HECA targets by 2005 has been slow, and an estimate made by the Energy Agency indicates that energy management policies could be reducing the *rise* in energy use per year by 50 per cent against a 'business as usual' scenario.⁸³ While

⁸³ LEA 1999

this is no mean achievement, it indicates the difficulty of implementing urban energy management even for a highly proactive local authority, (Box 8).

Furthermore, several aspects of Leicester's success give cause for concern:

- ◆ The reliance on external funding makes the future of any initiatives uncertain, and requires considerable amounts of officer time to secure. This funding is unlikely to be sustainable as many grants are given specifically for the purpose of creating "demonstration" projects, rather than for pursuing tried and tested means of achieving energy efficiency. This raises doubts about how far other local authorities will be able to replicate Leicester's achievements.
- ◆ Central government policies to reorganise and modernise local government have had mixed impacts on the opportunities for local energy management, and their overall impact within Leicester remains to be seen.

Analysis

In considering the strengths, weaknesses, opportunities and threats to addressing climate change through local energy management in Leicester, the following points, some of which were also found to be applicable in the other two case-studies considered (Cambridgeshire and Newcastle), can be made:

Strengths

- Adoption of a medium to long-term perspective
- Ambitious objectives
- Connections between local initiatives and national policies, such as HECA and EST programmes, and international networks of cities
- Organisational and institutional commitment and backing
- Ancillary benefits with respect to other (non climate change) policies and initiatives, such as addressing social, health and economic housing issues; monetary savings for local authority

Weaknesses

- Reliance on external funding and particular individuals makes schemes vulnerable to shifts in politics at local, national and international levels
- Lack of powers/resources to influence energy efficiency/use across all aspects of council activities
- Lack of powers/resources to influence energy use in the domestic sector, particularly private housing
- Initiatives to address building design remain piecemeal and opportunistic rather than standard practice
- Emphasis is on the potential of technical solutions and voluntary action, rather than more complex social/institutional elements of energy use.

Opportunities

- Domestic sector is critical for mitigation of climate change and local authorities have a key role to play if resources/powers are made available.
- Potential synergy between social, economic and environmental aspects of sustainable development, though also some contradictions.

Threats

- Concern to develop 'best practice' initiatives leads to isolated good examples in a sea of 'business as usual'.
- Conflicting government objectives about the role of local authorities

Chapter Four: Exemplars of Low-Carbon Initiatives

In this chapter we have selected some examples of low-carbon initiatives from across the UK, and from a variety of organisational types, in order to illustrate some of the existing work and its future potential. There are 468 local authorities in the UK (410 in England & Wales, 32 in Scotland and 26 in Northern Ireland) and hence an enormous amount of work going on which relates directly or indirectly to lowering carbon emissions (e.g. all initiatives on energy and transport). In order to limit the range of potential examples, we have attempted as far as possible to select those which:

- Relate explicitly to carbon reduction rather than primarily to energy and transport
- Explore carbon reduction across sectors, e.g. which look at energy efficiency & conservation, transport, waste, etc.
- Explore carbon reduction across scales, e.g. within single organisations, across a number of organisations, spatial area, etc.

We have started to develop a database of low-carbon initiatives in the UK, based on a standard proforma, which is designed to be filled-in by project managers. The database is presented in Appendix 3. It is hoped that this database can be maintained, further developed and used by practitioners, researchers, policymakers, commerce and NGOs.

4.1. Local and Regional Greenhouse Gas Inventories

Developing Greenhouse Gas Inventories at the regional and local government levels has become an increasingly common practice in the UK; from the pilot Councils for Climate Protection Programme (CPP) at the local level to the more comprehensive Scottish Inventory at the devolved administration scale. The scale and boundaries of the inventory, the time within which it was done and the methods used have a direct impact on its accuracy. Here we report briefly on the work that has been performed and the work that is currently underway, establishing problems that have been encountered.

Local Authority Scale Inventories

Prior to privatisation, post-coded energy consumption data was publicly available and hence accurate greenhouse gas inventories at the local scale were possible (up till the early to mid-1990s). Some local authorities worked closely with the regional electricity company on energy issues. Since then several local authorities have developed greenhouse gas inventories, most of

which have used disaggregation from national-scale data using appropriate local indicators (where available).⁸⁴ The problem with such top-down methods is that they are not sensitive to local and regional particularities or changes in policy, hence cannot be used to monitor the effectiveness of decarbonisation policies. It is also impossible to calculate the uncertainty associated with the emission figures. Some 'bottom-up' on energy consumption has been obtained in some local authorities, e.g. in Birmingham, Greater London and Greater Manchester.⁸⁵ The London Research Centre appears to have used some bottom-up approaches in its inventories of large urban areas, using a baseline year of 1996.⁸⁶ The CCP pilot (see chapter 3) represents a new approach to emission inventories in that bottom-up data is sought by the local authority, which in the case of its own energy consumption becomes a more feasible prospect. In some cases, local energy suppliers and other greenhouse gas emitting organisations have also been prepared to share data. The process of collecting data from across the local authority has been useful in several ways⁸⁷:

- It has indicated how data needs to be collected in the future across local government functions in order to allow carbon emissions to be calculated;
- It has increased 'ownership' of the climate change issue within the local authority.

Several authorities have now released their emission inventories, e.g. Lancashire County Council, Bury MBC, and Bristol City Council. More accurate bottom-up data than previously available has been obtained from waste authorities (for methane), from the Environment Agency (for large-scale facilities), from transport surveys, from Transco (for natural gas) and for households (an average electricity consumption per household being provided by the supplier, or more accurate post-coded data). It is likely that the data collected will have differing degrees of reliability because of varying access to bottom-up data and this will make strict comparisons difficult. The CCP authorities intend to utilise the inventories to establish private house and business energy usage and potential gains from efficiency measures. By making projections via scenario work they wish to establish potential future trends so that this can be incorporated into any future planning procedures. The CCP has not recommended specific CO₂ reduction targets for participating authorities; these are to be decided by individual authorities taking into account their own circumstances. It is interesting to note that several local authorities (e.g. Bristol) are connecting-up issues such as flooding and storm damage with the greenhouse abatement work.

⁸⁴ Lindley et al. 1996

⁸⁵ McEvoy et al. 1997

⁸⁶ London Research Centre, 1997a & 1997b. Inventories were developed for Merseyside, Bristol, Southampton and Portsmouth, Swansea and Port Talbot and included NO_x, SO₂, CO, NMVOC's, Benzene, 1,3-butadiene and PM_{10s} in addition to CO₂. The methodology employed is not described in sufficient detail for CO₂ to judge whether it is a truly bottom-up approach.

⁸⁷ Feedback from a meeting of North West CCP partners, Summer 2001.

Regional Scale

Regional emission inventories for all six greenhouse gases have been prepared for several English regions, including Greater London, the North West, East Midlands⁸⁸, whilst carbon inventories are available for the North East.⁸⁹ For methane, nitrous oxide, fluorocarbons and sulphur hexafluoride, some bottom-up data is frequently available at the local to regional-scale. For carbon emissions, however, these regional inventories have largely relied on top-down pro-rata methods, with the addition of source data from power plants in the region. An exception is the work of the Greater London Assembly, which has turned an energy use study into an emissions inventory. The utilities and regulators have provided information from the utilities and from the regulators at a post code level and aggregated upwards the results. This seems to be an encouraging example of more bottom-up data collection methods, which is largely within the province of electricity supply companies to permit or not as the only holder of the relevant data.

Several efforts are now underway to improve the reliability of regional inventories. The Tyndall Centre and Environment Agency are working via the entitled Greenhouse Gas Regional Inventory Project (GRIP) to establish robust methodology for building an inventory utilising a feasible bottom up approach for data collection. Yorkshire Forward has contracted Cambridge Econometrics to provide a model for the RDA to monitor and project regional greenhouse gas emissions. The model takes the character of the regional economy into account, drawing together a wide range of relevant data sources at national and regional levels and allowing projections to reflect the impact of regional policies designed to curb emissions. The study will recommend and implement a clear methodology to estimate regional emissions of greenhouse gases historically, to estimate current emissions, and to project emissions into the future under a range of alternative scenarios. One scenario will focus on the impact that growth in different economic sectors is likely to have on emissions, employment and output. The model will be used to identify which sectors have the most and least impact on greenhouse gas emissions and on employment so as to inform an assessment of the nature of trade-offs between the goals of increasing employment opportunities and achieving environmental sustainability.

Devolved Administration Scale

The Scottish Inventory of the six 'Kyoto' greenhouse gases was first published in March 2000. The work was carried out by NETCEN in Abingdon, which

⁸⁸ Mander et al. 2000, Fleming et al. 2001

⁸⁹ TNEI 1999, GLA 2002

has been responsible for conducting the UK scale inventories. For the electricity components, data was gathered from source, i.e. the power generation sites that are present in Scotland, and not on end user consumption. Account has been taken of the fact that Scotland generates more electricity than it consumes (exporting the excess to other parts of the UK).NETCEN used earlier work carried out by (what was then) MAFF to gain data on agricultural emissions of methane and nitrous oxide. The current inventory cannot be disaggregated below the Scotland scale, though work is currently underway to produce the data on a 1 kilometre grid. Limited information was available on traffic and data on petrol sales was therefore used as the basis for transport emissions data (this being available for Scotland from the DTI). A disaggregated inventory for Wales has also been produced.⁹⁰

Scale / Area	Organisation	Scale	Approach	Follow Up
Devolved Administrations				
Scotland	Scottish Executive, NETCEN	Sub-Divisional	Mixed	Projections and some smaller scale work
Wales	Welsh Assembly			
English Regions				
North West	Tyndall, Environment Agency, NW Climate Group	Regional	Mixed (2000 inventory) & Bottom-Up (GRIP)	Short to long-term scenario evaluation
Yorkshire & Humberside	Yorkshire Forward, Cambridge Econometrics	Regional	Bottom-up	Economic modelling, scenario testing, planning
Greater London	GLA	Regional	Bottom-up	Projections & planning
East Midlands	East Midlands Sustainable Development Round table, De Montfort University	Regional	Mixed	Planning
Local Authority Scale				
Lancashire	Council, CCP	Local Government	Mixed	Projections and strategies
Bristol	Council, CCP	Local Government	Mixed	Future policy.
Merseyside, Bristol, Southampton, Portsmouth, Swansea, Manchester	London Research Centre	Local Government	Mixed	Support for other prospective work.

⁹⁰ www.wales.gov.uk

Problems Encountered and Opportunities

The various studies performed have highlighted the difficulty of gaining data at a sub-national level following privatisation. The Electricity Act appears to provide a legislative basis of the government to require energy supply companies to provide post-coded data on consumption. The argument from some companies that the data cannot be provided because it is confidential can be countered by: a) only requiring data to be provided for the first four digits of the post-code; and b) using a third-party to collect, aggregate and store the data, which would then be available to users only in an aggregate form (e.g. total electricity consumption over a specified time-period for an area represented by the first four digits of the postcode). Such a scheme operates in Sweden with a University in Gothenburg being responsible for collating and storing the data, which is then available on payment of a small fee to cover data retrieval costs.

The CCP project has introduced many councils to the idea of calculating emissions at the local scale that will provide very useful for year on year studies. There is a clear need for a robust inventory methodology at the regional scale which both GRIP and Yorkshire Forward are working towards. Regional level greenhouse gas emissions are useful for mitigation strategies being developed by the RDAs and Regional Assemblies. Energy and other spatial data for the devolved administrations may lend themselves more readily to bottom-up inventory development. There is no established methodology for the creation of sub-national inventories, however, with those in place being developed and applied differently.

4.2. Examples of Local to Regional Low-Carbon Sustainable Energy Initiatives

At the regional and local scale there are many initiatives concerned with development of low-carbon energy supply. Broadly speaking these can be classified as:

- Energy partnerships
- Renewable energy offices/bodies
- Charities
- Community initiatives, these may be funded from government sources but the initiation comes from individuals and community groups
- Public organisations, e.g. educational establishments & hospitals
- Local Authorities and LA21
- National Park initiatives
- Databases

- Initiatives from private firms, alone or in partnership with other organisations
- Ambitious individual projects
- Energy service initiatives
- Household & individual initiatives

Note that national-level government initiatives, agencies and programmes are not included in this chapter, but a summary of these can be found in Appendix One. There are also an increasing number of building projects that show renewable energy, energy efficiency and sustainable design in practise. Some of the best examples of such projects are described within this summary; more examples are briefly described in the completed proformas (Appendix 3).

Energy Partnerships

We include here examples of partnerships which seem to us to have the most comprehensive objectives and which are in the process of implementing these objectives.

Brent Energy Network, London

Brent Energy Network runs an educational centre in Brent Borough aimed at schools, this includes a permanent PV panel and solar water heating demonstration model.

Cornwall Energy Partnership

Has an action plan to increase sustainability of energy.

www.cornwallenergypartnership.org

Forest of Dean Energy Team / Severn Wye Energy Agency

The Energy Team is a non-profit making organisation sponsored by the European Commission's SAVE II programme, Forest of Dean District Council and the Rural Development Commission. It is part of European Partnership along with Newark and Sherwood Energy agency.

The objectives are outlined below:

1. Information, Advice and Awareness Raising - improving access to information, - promoting good practice - motivating action.
2. Planning and Integration - integrating energy into local policies, - maximising use of local resources, - energy efficiency and renewable energy in new developments

Implementation and Incentives - overcoming barriers to sustainable energy, - schemes to deliver energy efficiency, - practical projects and technology demonstrations

Furness Energy Partnership

An energy agency set up by Barrow Borough Council and funded under the EU SAVE II programme. The partnership offers energy advice to households and local businesses; in particular it has developed the Cumbria Mobile Energy Advice Centre. In addition, FEP works alongside local renewable energy developers and groups to develop renewables within the area.

www.furnessenergy.co.uk

Kirklees Metropolitan Borough Council

Highly active on HECA, renewable energy development (e.g. solar club, Countryside Agency initiative), CHP / district heating and energy efficiency advice centre.

The Simply Solar initiative

A collaboration between the Kirklees and Calderdale councils working together and in partnership with the Energy Savings Trust, Kirklees Energy Services, West Yorkshire Solar Club and 2 major UK manufacturers of solar panels Filsol and AES. The scheme provides funding for 200 homeowners in Calderdale and Kirklees to have solar panels installed to heat their hot water. The scheme offers homeowners in Calderdale and Kirklees two ways to install solar water heating, by a professional installer, who will fit the solar panels over 1-2 days, or the cheaper do-it-yourself option with help and advice from the West Yorkshire Solar Club, which is run by the ATC. To participate, roofs must be south-east to south-west facing and solar panels cannot be connected to any combi-boilers as yet under this scheme. The grant available from the Energy Savings Trust means that a professional installation, with a new twin coil cylinder, all fitted and working, will cost about £1,100 (including VAT). The DIY installation through the Solar Club will cost about £850.

Newark and Sherwood Energy Agency

Founded in 1997 with EU money (under the SAVE II) programme, the agency aims to develop a 'Sustainable Energy Sherwood and Newark'. In addition to more general objectives related to energy efficiency, it has specific objectives concerning monitoring District Council activities and producing a strategy to reduce these by 20% by the year 2010. Concerning renewables, it has produced Special Planning Guidance for wind Energy Schemes in the district. Within the Sustainable Energy Strategy specific proposals for reducing energy demand within the district along with how to increase the supply of renewables are proposed.

www.nsenergy.co.uk

Nottingham Energy Partnership

Funded by Nottingham City Council the objectives of the energy partnership are:

1. to promote and encourage efficient use of energy through appropriate public relations activities
2. to access local, national and EC program funding to implement local energy efficiency projects
3. to develop an effective local and national policy role,
4. to develop appropriate energy monitoring and efficiency benchmarking.

The NEP does not have quantified CO₂ reduction targets. Current projects are:

The energy partner scheme: Nottingham based companies are being asked to make a voluntary local commitment to save energy or reduce greenhouse gas emissions. Participating companies can nominate what savings they will make and NEP will assist them in making those savings. All those companies participating will be acknowledged by a Nottingham Mayor's certificate. Every year NEP will publish aggregated savings made in Nottingham to show the extent to which the city is contributing to national targets.

The thermal imaging survey: NEP, in partnership with the British Geological Survey, is proposing to undertake a Thermal Imaging Survey of Nottingham to identify thermally efficient and inefficient buildings. Thermal imaging identifies buildings that lose heat from their roofs and windows and even walls, and is used to target homes that need cavity or roof insulation and double-glazing. In addition this project hopes to identify those houses that are not heated adequately due to "fuel poverty". The data will be added to the Council's geographical information system and it is intended that this data will support implementation of the Government's new Home Energy Efficiency Scheme.

Domestic energy alliance: Scottish Power, Nottingham City Council and the NEP Housing Task Group are offering residents of Nottingham an opportunity to save money on their energy bills by offering competitive prices for their gas and electricity. For every resident who chooses Scottish Power for their gas or electricity or both, they will make a contribution to the Council's Community Energy Fund. This fund will be used to provide energy efficiency measures to low income households.

Bulk discount scheme: Reduced prices on home energy efficiency materials, along with a free energy survey.

Business site audit: Free site energy audit for businesses

An ongoing major project is Generating Solar Homes; working with Housing Associations this project aims to help the social housing sector take full advantage of PV opportunities. More on this is found in the Government initiatives section of this summary.

www.nottinghamenergypartnership.co.uk

Pembrokeshire Energy Agency

The Agency is developing a baseline analysis of energy use in Pembrokeshire.⁹¹ A network of energy services and providers in the area has been produced. A particular focus is development of small-scale renewable energy projects and the Agency has assessed the following opportunities: small-scale hydroelectric, PV, wind/solar powered electric fencing, wind turbines, wood pellet heaters and solar powered water pumping. The Agency is a partner in the Pembrokeshire Biofuels Partnership, which is undertaking a feasibility study to convert the boilers at a comprehensive school, primary school and leisure centre from oil to wood pellets. The Partnership is also exploring the possibility that Caldey Island (with a population of 50) become self-sufficient in renewable energy to replace the undersea electric cable and shipped solid fuels. The Agency is exploring use of wood chip waste from a saw mill as a source of heat and also the potential utilisation of waste heat from an oil refinery in district heating.

Thames Valley Energy Agency

The agency began work in 2001 and is funded by the European commission and through the private sector with a number of sponsoring companies. The sponsors offer a mixture of financial support and 'in kind' expertise. These include RSPB, Oxford Brookes University, Friends of the Earth, National Wind Power, Montgomery Watson Hara, University of Reading, Waitrose, TXU Energy, Shanks Waste Solutions, Greenham Trust, Government Office for the South East, Environment Agency. The objectives of the agency are to work with the 16 local authorities of the Thames Valley and the private sector to raise awareness, create interest, identify flagship projects and deliver these. The initiative is funded until 2004, and the work timetable is shown below:

Launch and First energy assessment-3 months

Strategy and planning- 5 months

Projects and initiatives, supporting research and development- 33 months

Review and marketing of flagship projects-36 months

Although still at the proposal stage, funding is being sought for a number of pilot projects to be used to demonstrate low carbon technologies in action. These so far are as follows:

Greenham business park: A feasibility study has been performed to investigate the potential for the Park to become 100% renewable energy self-sufficient. A series of wind energy, biomass and PV projects are now proposed in order to achieve this goal by the year 2010. An aspiration is for this project to become one of the '100 Communities' under the EU programme described within the proformas.

⁹¹ Pembrokeshire Energy Agency, 2001

Fuelcom: A proposal under the European Commission's 5th Framework research programme to evaluate, demonstrate and disseminate the benefits of integrated bio diesel solutions in regional schemes in the UK, Greece and Ireland. A comparison will be made between the impacts, in terms of environment, economics and community benefits, with conventional diesel. TV Energy has three main partners in the project, Sainsburys and Waitrose who will be trialing the bio diesel in selected vehicles in their Thames Valley fleets, and Æolus, who will be supplying the bio diesel.

DTI building integrated PV bid: The organisation is working with its partner Local Authorities and public sector sponsors in the preparation of two bids to be submitted under this funding scheme. One is with South Oxfordshire District Council for their Arts and Entertainment Building, within the new Didcot town centre, and the second is with Oxfordshire County Council for a primary school near Banbury. In addition to these projects, hoped for outputs for the initiative include a web site, an annual conference and an energy surgery.

The Northern Energy Initiative (TNEI)

TNEI is the only regional-scale energy agency in England and provides a possible template for other regional agencies. TNEI covers the North East and arose out of energy management efforts in Newcastle; it includes a renewable energy arm called Renew North. TNEI has undertaken a comprehensive review of energy use in the North East region entitled *Energy For a New Century* (2000) which proposes a number of targets (e.g. c. 15% reduction in energy consumption and CO₂ emissions by 2010, along with £500 million reduction energy cost per annum, and creation of 3,500 new jobs). The report also identifies a number of flagship projects including CHP, wind energy, PV, green transport, energy efficient housing, and clean coal technology.

TNEI organises seminars and workshops for local and regional decision-makers, e.g. on the Climate Change Levy. It also coordinates awards for leadership on sustainable energy. TNEI has facilitated several major wind power developments, e.g. the TeesWind project, which could see the development of one of the world's largest urban wind farms. An area of old industrial brownfield owned by Corus on the south bank of the River Tees (within Redcar & Cleveland Borough) is the proposed site. Approximately 30 turbines are being planned, generating sufficient electricity to supply the annual electricity requirements of 45,000 homes. Partners in TeesWind include: Corus, AMEC Border Wind, Northern Electric and has the support of Redcar & Cleveland Borough Council, the leader of whom stated that: "TeesWind represents an innovative approach to dealing with large tracts of former industrial land which would otherwise remain underused for long periods of time".⁹² Another TNEI initiative is to explore the potential for the

⁹² www.tnei.org.uk

rural area of Teesdale to be supplied with 100% renewable energy, through a combination of biomass, wind, solar and hydroelectricity.

Western Regional Energy Agency & Network (WREAN), County Fermanagh, Northern Ireland.

WREAN is involved with two small renewable energy demonstration projects as well as acting as an advice centre for energy efficiency improvements. The renewable energy projects include a 6 kW wind turbine at a primary school in Enniskillen, and at Higher Bridge buildings and the SHARE centre at Lasnaskea Pvs and solar heating have been installed.

Renewable Energy Offices

Midlands renewable energy technology transfer

A network to help the transfer of technology from universities to industry.

www.mrett.co.uk

Orkney Renewable Energy Forum

Two wind turbines have been installed in Orkney, rated at 1.5 and 2 MW, whilst others are being actively planned. Wave power is being promoted with the setting up of the Marine Energy Test Centre in Orkney. The strong island channel currents present a major opportunity for tidal power and an upstream axial-flow turbine mounted on a monopile has been proposed.

www.icit.demon.co.uk/forum

Renewable Energy Development Initiative (REDI)

A new 3-year renewable energy development initiative run by the Severn Wye Energy agency to stimulate local interest in community renewables in Gloucestershire. The Renewable Energy Development Initiative (REDI) aims to stimulate local interest in community renewables projects and provide development support to new projects established through the scheme. Through the development of a training and awareness programme to generate interest in local renewable energy sources, REDI hopes to encourage a wide range of renewables projects, from commercial-scale schemes with community involvement to individual purchases of renewable energy systems such as solar water heating. Project development support, following the training, will include help with technical information, assessing feasibility, locating suppliers, identifying sources of finance and developing partnerships. The initiative is being funded by the Environmental Action Fund as part of the DETR's "Are You Doing Your Bit?" campaign, the Shell "Better Britain" campaign, the JJ Charitable Trust and the Mark Leonard Charitable Trust. SWEA is currently developing:

1. training materials and renewable energy case studies for the project.

2. databases of equipment suppliers, funding sources and Gloucestershire-based organisations interested in taking part in the training.

Shetland Energy Club

The Club is an association of local businesses and agencies committed to reducing carbon emissions. A Swedish company, called Seapower, is planning to construct a floating wave power station in Shetland, capable of generating 1.5MW, which will feed into an existing undersea power cable. The power station will take the form of a steel barge, moored off the coast. The direction of the barge can be changed to take advantage of the wave and tidal direction. The waves will run up a ramp and turn the blades of a turbine. Seapower is also working with the University of St. Andrew's to produce hydrogen from the Shetland wave power platform. BMW and Daimler-Chrysler have both expressed an interest in utilising the hydrogen so produced. It is estimated that one plant would produce enough hydrogen to supply the yearly fuel needs of 230 cars.

www.users.zetnet.co.uk/s.e.c./index.htm

South Midlands Renewable Energy Advice Centre

The Centre was established with support from the European Commission under its ALTENER programme, DTI and a number of other sponsors including local authorities and commercial organisations. The Centre acts as a focal point for all aspects of renewable energy on the South Midlands. It is pro-active, stimulating interest in renewable energy throughout the region, and reactive in responding to requests for information and enquiries. It could serve as the model for a network of similar centres in the UK and Europe.

Charities

Energy 21

UK branch of Eurosolar, providing education and information.

www.energy21.org.uk

North Tawton Environmental Trust (Devon)

This is an environmental rather than energy organisation, supported by the National Lottery Charities Board, though they have done a renewable energy feasibility study and want to be part of the '100 communities' project. At the present time projects are a Tree Nursery, home composting and so on, though funding is being sought for development of community renewables.

01837 89069 www.northtawtonn.freemove.co.uk

Plugging into the sun/Schools and Homes Energy Education Project

Based at the Heeley City Farm in Sheffield this charity offers educational resources and workshops concerning energy efficiency and renewables. There is a strong focus on solar.

www.pluggingintothesun.org.uk

Community Organisations

Alternative Technology Centre

Hebden Bridge (W.Yorkshire) has a solar club, green shop and a web site with a number of information resources including the very cuddly 'Going green for softies'. Future plans are for a canal side ecopark.

www.alternativetechnology.org.uk

Awel Aman Tawa

Awel Aman Tawe is a community project set up by local people in the Upper Amman and Swansea Valley area on the 15th September, 1998 to develop the first community-led windfarm in Britain. The wind farm would provide: Profits to support community projects and businesses; an Environmental Education Centre attracting school groups and tourists ; Local employment ; Clean Energy ; Cheap electricity to local industrial estate. The project is run by volunteers. Funding has been received from a variety of sources: £75K for feasibility and other studies from Enfys, which is part of the Green Spaces and Sustainable Communities Program operated by the New Opportunities Fund (drawn from the National Lottery), Objective 1 support, the Welsh development Agency, Shell Better Britain, DTI, and The Princes Trust. A business plan will be written to raise money for the turbine development. In March 2001 46% of local people voted in a referendum run by the electoral reform society. The majority supported the wind farm. The next step is for the group to prepare an environmental statement and a planning application. The group has written a toolkit with the DTI aimed at developers to help them involve communities and communities wishing to develop a scheme. An energy efficiency handbook is also planned.

www.awelamantawe.co.uk

Cothi renewable energy group,

A new initiative, set up to try and replicate the Awel Aman Tawe project, with similar objectives to utilise renewables to fund community regeneration.

Dyfi Eco Valley Partnership

A locally-controlled not-for-profit organisation whose mission is to foster sustainable development in the Dyfi Valley. It was formed in 1997 as a partnership between local people, businesses, voluntary bodies, local authorities the National Park and the Welsh Development Agency. It works by awareness raising, by networking, by stimulating action and by garnering resources to focus on specific projects. It sees itself as a test-bed for local involvement in the "green" economy and for partnership working towards sustainability in a defined geographical area. The Partnership is targeting five areas of the "green economy" for action, though these will change over time. Activities in these areas are designed to be inclusive, build the capacity of the

community to continue the improvements and to maximise local control and local benefit. Projects normally integrate more than one of the themes. These “themes” are: energy; sustainable tourism; woodlands; transport; waste.

DEVP’s first project was the **Community Renewable Energy Project**, working towards a strategy for “greening” the local energy economy. The project employs a full time member of staff and has established a number of small community-based water, wind, solar and wood-fuel schemes. It has brought around £300,000 into the local economy and raised awareness of energy issues as well as placing the Dyfi valley at the forefront of involving local people with renewable energy. Main funders are the European Commission (ERDF 5b), the Welsh Development Agency and the Shell Better Britain Campaign, with Powys County Council and Dulas Ltd providing additional support. In addition, DEVP runs a number of local solar clubs and has funding to expand the network into the rest of Powys.

www.pco.powys.org.uk/ecodyfi

Low Impact Living Initiative

Based in Redfield Community Housing Co-operative this a non-profit organisation dedicated to helping protect the global environment by researching and promoting sustainable, low-impact alternatives to various aspects of everyday life. The group runs courses, provides information books and install a range of features such as PV, solar hot water systems and grey water recycling. Future projects are the installation of solar water heating to 50 homes with the Energy Saving Trust and development of a bio diesel plant. LILI is supported by the EST and Aylesbury Vale District Council.

Dave Darby or Phillip Hunt, 01296 714184, lili@lowimpact.org

Solar for London

Solar for London is being set up and run by the London Solar Club. This project, covering the whole of London is to encourage domestic installation of solar water heating by offering a discount purchasing scheme.

100 Communities, Campaign for Take Off

The ‘Campaign for Take Off’ is part of the Community’s aim of working towards doubling the EU Renewable Energy Sources share by 2010 (from 6 to 12%). The initiative for the Integration of Renewable Energies in 100 Communities is concerned with encouraging the development of 100 community-based schemes that can reasonably aim at 100% power supply from renewable energy. Participation in this network provides the use of a logo, competition for awards, a support network and project monitoring.

www.fedarene.org

Public Organisations

The Bet

The Bet was made between the European Youth Climate Campaign and Margot Wallstrom, European Environment Commissioner and Dominique Voynet, chair of the European Council of Environment Ministers. The objective of the Bet was to show to young people than even with small initiatives and little money drastic CO2 savings are possible in a short time period. The Bet was ‘won’ when at least 88 schools from at least 8 European countries participated in reducing 8% of their carbon emissions within 8 months. The Bet has now finished, having been successful in all countries. The UK did not participate.

Community Carbon Reduction Plan (CCRP)

The University of East Anglia (UEA) is spearheading an ambitious carbon reduction plan for the south part of Norwich, currently at the feasibility stage. The target reduction is minus 60% by 2025. The partners include Local Authorities (Norfolk County, Norwich City), Local Education Authority, CGNU and Norwich Research Park institutes. The proposal is to adopt a cross-sectoral and multi-organisatoinal approach that will tackle individual and householder lifestyles, neighbourhoods, students, commuters and the city-scale.

University Sector

One of the most inspirational carbon reduction activities within the university sector internationally is that at the

University of Buffalo (UB) in New York state.⁹³ The Energy Officer there, Walter Simpson, has been working for twenty years on improving the energy performance of the campus and UB estimates that it is preventing the release of 31,000 tonnes of CO₂ annually through its improvements. Simpson has also identified the embedded energy in the supply-chains for virgin paper, prompting investigation and implementation of the use of 100% post-consumer recycled paper. Various publications are available from the UB experience.

In the UK, many universities use CHP, and many have explored potential expansions or development of CHP. In many cases the plans have failed to come to fruition for some or all of the following reasons:

- Logistical problems associated with installing CHP pipelines on campus or connecting up to other district schemes
- Need to expand the users of the heat produced because of variable demand due to teaching terms
- Reluctance of university administrations to tie-themselves into long-term contracts with suppliers of electricity and heat from CHP, especially given privatisation
- Primary focus by university decision-makers on reducing energy costs

Many universities do not charge users of individual buildings the energy costs separately, which is then paid from central funds distributed according to building type, research and student and staff numbers, etc. Hence, there is less incentive for energy consumption to be controlled in individual buildings. The onus is on the energy manager, who frequently has access to energy consumption data on daily or even 30 minute time intervals, to persuade the university administration to fund energy efficiency improvements, which can be difficult in a time of budgetary constraints.

Wigan & Leigh College Travel Plan

The college proposes to reduce dependency on car travel as part of the Eco-Campus Environmental Management System, which the college is helping to develop and pilot.

Local Authorities and Agenda 21

⁹³ www.safeclimate.net/action/stories

The proformas give many examples of local authority initiatives and general work under HECA and energy management is covered in Chapter 3 and Appendix One. Local authorities are extensively engaged in partnerships and Energy Service operations, described elsewhere in this chapter.

Within many local authorities, it is the LA21 requirements that have been the driver for authorities embarking on renewable energy initiatives with a number of different objectives. Objectives include raising awareness of energy requirements and its consequences, advice to developers, promoting renewables through council services, exploring the feasibility of projects in the local area, etc. A few examples of projects that have stemmed from La21 activities are given below.

- Woking Borough Council has installed PV pay and display machines
- Bedford Borough Council has a renewable energy projects website
- Newark and Sherwood Energy Agency initiatives
- Bury are looking at the feasibility of developing small scale hydro schemes on the Irwell
- Worcestershire County Council has installed 150 PV powered bus shelters.

London: Hydrogen Buses

Westminster Council are operating two hydrogen fuel-cell vehicles, a taxi and a parks vehicle. Two schemes bring hydrogen fuel-cell buses to London are being planned for the next few years, e.g. the CUTE project. Westminster is offering free re-charging of electric powered vehicles at two car parks and free parking for electric vehicles.

Newcastle-upon-Tyne: The Carbon Neutral Newcastle Plan

An ambitious proposal to make Newcastle a net zero carbon city by 2020 is currently being formulated by the City Council and the company Future Forests. It is proposed that the plan will be achieved by energy efficiency, planning, renewable energy and planting of forests to off-set carbon which cannot be readily eliminated in other ways. The project is at an early stage of development and partners are now being sought. Attention is being paid to the commercial benefits for companies and other organisations of being associated with the plan.

The plan builds upon past extensive work in Newcastle on energy and environmental planning which includes work on measuring energy consumption, combined heat and power, energy efficiency, renewable energy and traffic management.⁹⁴ CHP already supplies the Byker Estate, where waste has been used as the fuel (2,200 dwellings, a swimming pool, school library and other community buildings). A CHP plant at Freeman Hospital also supplies government offices, university premises and schools.

⁹⁴ Newcastle (1996)

Photovoltaics have been incorporated as demonstration projects into several building designs in Newcastle. As of 1995, energy efficiency had reduced energy consumption in municipal buildings by 50%, saving £1 million and 50,000 tonnes of CO₂ per year. The city council explored the possibility of a large city-centre CHP system in the 1990s, which would have supplied 10 MW electricity and 13 MW of heat. Adrian Smith from the City Council noted in 1995 that: "[it] has proved to be difficult to take CHP development significantly beyond buildings in local authority ownership. The current city CHP is close to financial viability, but it is clear that more positive Government policy towards this technology, comparable with that for renewable energy for example, could accelerate progress in this field. CHP is probably the single most important initiative if cities are to reduce global atmospheric emissions associated with energy use".⁹⁵

The case of Newcastle illustrates that there is a strong role for the city to play in collecting and disseminating information about energy management and energy efficiency: "... important lessons learn Newcastle is that the city should itself review all aspects of energy use within it areas, set targets for environmental improvements and then seek to influence the many and varied suppliers and users of energy. Within the city there are many players who affect the use of energy and its environmental consequences, but there is generally no overview of what is happening. The local authority is uniquely placed to undertake a leading role in auditing, identifying appropriate solutions and implementing these solutions in partnership with the many interested parties".⁹⁶

Nottinghamshire Millenium Electric Vehicle Project

Under this project 24 electric vehicles are operating in Nottingham and Nottinghamshire, the city and county council, Powergen and Powershift being the lead partners. At present the vehicles are powered by electricity from fossil fuels, which has limited carbon reduction benefits. The real potential lies, however, in the use of renewable energy to provide the electricity. Clearly reduction of local air pollution and noise are key objectives.

National Parks

North Yorkshire Moors National Park: Moorsbus

Moorsbus is a network of bus services serving the North York Moors National Park. Specifically aimed at serving the needs of visitors to the National Park, Moorsbus is designed to create a flexible inexpensive network that is a competitive means of transport to the private car. Moorsbus has been

⁹⁵ Smith, A. in Newcastle, 1996

⁹⁶ OECD 1995

developed by North York Moors National Park with the aim of increasing the proportion of visitors visiting the park by public transport so reducing pollution produced by visitors travelling to the Park. In its present form, Moorsbus has been running for 10 years. A study last year by the National Park found that 34% of Moorsbus passengers could have used a car and would have travelled 1,176,637 miles (1.9 million kilometres) by car. However, as most leisure car trips consist of 1.7 people, the figure was reduced to take account of this, resulting in **692,139 miles** saved (1.1 million kilometres of private cars kilometres saved). (This is despite the impact of Foot & Mouth disease which was widespread in the region during 2001). Using the standard Department of Transport figure for the economic benefits of reducing car journeys (0.15p per km) this gives a **saving of £166,000**.
<http://www.moorsbus.net/>

Databases

Bedford Borough Council

Renewable energy forum has set up a database of projects in Eastern England.
www.sustainable-energy.fsnet.co.uk

Ecodatabase

Provides project information and a search facility for 150 ecological and environmentally friendly residential projects from across the UK and the continent. The database is managed by Sustainable Homes, a body funded by the Housing Corporation and a number of sponsoring Housing Associations.
www.sustainablehomes.co.uk

From the ecodatabase

Searches according to scheme; environmental features e.g. air, water, communications, materials, biodiversity, energy, quality of life; aspects e.g. architect, engineer etc; region. One problem is that you cannot search for multiple features so you cannot look for a selection of energy projects, you have to go through each feature separately. Very few of the projects give any results in terms of carbon reductions in the database. Although many of the projects are being monitored, there are not many results within the database

43 schemes with active solar
16 schemes with biomass
0 schemes with building integrated wind power
1 scheme with no central heating required
11 schemes with CHP
4 schemes with geothermal energy
12 schemes with heat pumps
20 Schemes with grid connected PV
3 schemes with PV off grid

11 schemes with wind power
2 schemes with water power (CAT and Earth Balance)

Renewable energy for the home

Free database run by NEF to provide advice on renewables. Not up and running yet.

Positive Power

This website provides information on renewable energy. It can be accessed at: www.postivepower.co.uk

Government Initiatives

This is very much a snap shot, focusing on initiatives that have a community focus. More information is provided in Appendix 1 on programmes and schemes.

Consulting with Communities Toolkit

Written by community practitioners for developers, funded under the DTI New and Renewable Energy Programme.

Energy Services Projects

Funded by the EST and Transco, energy services schemes are where energy suppliers move away from selling energy, i.e. gas or electricity by the kWh and instead provide the energy services e.g. light, heat and power as a total metered package. The Woking Thamesway initiative is an energy service provider and the New England Quarter scheme in Brighton that URBED are working on has an ESP at the heart of the CHP scheme. These private wire schemes are still at an early stage, most of the ESP projects at the moment are a council or Housing Association linking up with a supplier and negotiating reduced rates if tenants sign up with the nominated supplier. Often the supplier will pay money into an energy efficiency grant fund for every customer who signs up. There are a number of these schemes, e.g. Nottingham Community Housing Association. The ESP initiatives tie in with a Housing Association target that 70% of Housing Associations have an affordable warmth strategy by 2004.

Generating Solar Homes

To create networks and support renewable energy is the aim of Nottingham Energy Partnership's project. NEP will be working with housing associations in the UK to help make photovoltaic technology a reality for housing associations. Both previous rounds of the DTI trials have been dominated by housing associations who will be sharing experiences and solutions to make PV a reality. Over 30 projects, resulting in more than 500 hundred PV roofs, have benefited from the £5.4million allocated to date. Building on the success

of the programme the DTI will be running a £20million PV subsidy programme next year. Generating Solar Homes will specifically be looking at barriers and

solutions to making PV a real choice for housing associations, building on the success and experience brought to light by housing practitioners working with PV. It will also provide the opportunity to lobby policy makers and develop a strategic view.

Solar

PV systems in 100 schools.

Initiatives from Private Firms

A good review of private sector activities on carbon reduction is found in Romm (1999). Since that book, several prominent firms have made striking commitments to reduce carbon emissions, e.g. Dupont has announced that it will voluntarily reduce emissions of greenhouse gases by 60%, and source 10% of all its energy from renewable sources, by 2010. STMicroelectronics has gone even further and committed itself to net zero greenhouse gas emissions by 2010 through efficiency improvements, increasing utilisation of renewable energy (PV, wind, solar) and through offsetting the remaining greenhouse gas emissions through reforestation.⁹⁷ Here we briefly describe the activities of a few UK-based firms.

British Industrial Plastics: vegetable derived diesel fuel

Based in Birmingham, British Industrial Plastics recycle waste vegetable oil as a diesel fuel substitute. Currently in use for their own vehicles, British Industrial Plastics are looking for other commercial consumers of this fuel.

Empower

Postcard flyers that people return to show support for renewable energy projects.

Humber Trade Zone

Industrial Symbiosis or By-Product Synergy™ programme. This programme is being developed by the Business Council for Sustainable Development North Sea Region and the Humber Trade Zone. It aims to foster closer ties and integration between Humberside industry. Local markets for by products (e.g. hydrogen and propylene) are developed, so reducing waste flows and transport of material. A feasibility study is underway to link-up process plants along both sides of the Humber using feedstock pipelines - called 'The Humber Bundle'. The proposal is being promoted by major local firms such as BP Amoco and Air Products. A new 475-650 MW CHP plant will use hydrocarbon by-products from the Humber refineries, reducing gas flaring and greenhouse gas emissions. The CHP plant is being developed by

⁹⁷ www.safeclimate.net/action/stories

Global Power Developments Ltd (a joint venture between Conoco and Total Fina Elf), and could supply low grade heat to existing and new local users (e.g. horticulture and fish farming), as well as further reducing carbon dioxide emissions. It is estimated that a 475 MW plant will reduce CO₂ emissions by 3.3 million tonnes per year compared with generation by conventional means. If a 950 MW plant were to be constructed the benefits would double.

Islay Wave Power

A 500 kW wave power known as the Limpet 500 is being developed by Wavegen, in collaboration with Queen's University, Belfast. The device will be constructed on the rock face of the Islay shoreline.

www.wavegen.co.uk

Interface Flooring Systems (IRS)

Interface is well known for its progressive stance on sustainability and has a long-term ambition of not only reducing its negative impacts but also of having a restorative environmental role, i.e. net zero CO₂ emissions. In the UK, the company uses renewably-sourced electricity at a number of its sites, e.g. Shelf Mills in West Yorkshire. The potential for renewable energy development at its sites (e.g. wind turbines) is being explored. IRS has also been measuring and publishing the global warming potential associated with production at each facility. IRS is a member of a small club of firms in the UK which are business leaders on climate change. Whilst local community initiatives have been initiated by the company in relation to biodiversity, Interface has not as yet conducted any community work on energy.

Pilkington

Pilkington is a business leader in energy efficiency, which is largely explained by: a) the high energy costs of manufacturing glass; and b) the involvement of the company in manufacturing energy efficiency products, e.g. double-glazing. A CHP plant serves the energy needs of its St. Helen's site. The company itself uses much of the heat, though the possibility of providing local factories and housing with heat was explored. In the event, the negotiations proved too complex and out of time-step with the company's plans. Speculative developers did not wish to tie themselves into the CHP scheme and were reluctant to provide additional capital upfront. The company has not initiated a community programme on sustainable energy. It has, however, formed the Pilkington Energy Efficiency Fund from company profits to support demonstration projects and agenda-setting activities on improving domestic energy efficiency.

Rolls Royce

Rolls Royce has a target of cutting CO₂ emissions by 10% by 2003 (relative to 1998). This has already been achieved by installing a CHP plant. The company is also considering the potential for renewable energy development at certain sites. The use of Life Cycle Analysis (LCA) has

demonstrated that the impacts of the company's products are three orders of magnitude greater than the impacts arising from the manufacture of its engines. This has led the company to set a target of a 1% improvement in efficiency of its products per year for the next 10 years, with knock-on environmental and economic benefits. Magnesium is an important component of RR's engines, but the potent greenhouse gas sulphur hexafluoride (SF₆) is used in their manganese production. No viable alternative yet exists, but use of manganese reduces the weight of engines, so has efficiency benefits. Rolls Royce is also a major player in R&D on solid oxide fuel cells.

Urban Integrated Solar to Hydrogen Energy Realisation (Usher)

Usher is a project based in Cambridge which is intending to use solar power to produce hydrogen for a bus. The lead partners are the University of Cambridge and Whitby Bird & Partners. The PV cells will be part of a university building complex in the West Cambridge university site. The bus will connect this site with the city centre. The vehicle is expected to save over 21 tonnes of carbon per year through replacing a conventional diesel vehicle. Other benefits include reduced levels of air pollution (e.g. particulates), reduced noise and better public transport links. Funding has been provided by the European Community with support from BP (subsidised PV cells) and Stagecoach. The project is intended as a demonstration and is not commercially viable technology as yet. A parallel project is taking place in Gotland, Sweden, where two buses are planned, the PV cells being put onto the roofs of municipal buildings. A more extensive hydrogen fuel cell bus scheme is underway in Iceland as part of that country's plan to become the world's first hydrogen-based economy. (The hydrogen being provided by electrolysis from hydro-electric and geothermal power).

Windsupporters.net

Set up to help windfarms in the planning process by providing independent information for people.

Yorkshire Water, Asda and WS Atkins

A pilot scheme has been developed at the Knostrop water treatment works near Leeds involving the generation of methane gas from the decay of out-of-date vegetable and bakery products, combined with sewage sludge. The biogas is used to provide electricity and heating. This pilot may be extended on a much larger scale at the Marley works near Keighley. Yorkshire Water has also been working with Sheffield University on the use of waste vegetable oil from two processing plants to fuel a furnace and is about to trial the fuel at the Calder Valley incinerator near Huddersfield.

Ambitious Projects

Broughton Pumping Station

Refurbished pumping station, grade 2 listed building, has offices and a conference centre. It is powered by converting waste wood chippings into gas that is then mixed with a very small amount of diesel to fuel this enormous engine, which produces nearly 100kva each hour and considerable heat. This is then used to light and heat the building. The building uses some 48kva per hour so the surplus is exported to the national grid. Based on this successful community-led initiative, some elements of the community went on to develop Sherwood Energy Village.

Heeley City Farm, Sheffield

Heeley City Farm is a community based and led training, employment and youth project employing over 30 people, mostly previously unemployed, on a range of environmentally based enterprises. A new building was designed and built as a training and resource centre as a model of contemporary, bi-climatic environmental architecture within an urban context. It was conceived as an integrated eco system within the boundaries of the site and aims to be self-reliant in terms of its service supply systems. The building is a low energy, high thermal mass, passive solar design powered by renewable energy from photovoltaics and a wind turbine. The need for space heating was reduced to a minimum. There is a grass roof in which the PV cells are located, the PV cells do not use glass in their construction to make them less vulnerable to vandalism. The new buildings and Proven wind turbine are integrated within the existing network of buildings on the site; the chosen turbine is suitable for use within an urban environment. The expected output from the renewables is approximately 3650 kWh a year (3,200 from the wind turbine and 450 from the photo-voltaic panels). The installed internal lighting load, including the stables, is less than 2 kW, and annual lighting consumption should be less than 2000kWh. Electricity use for heating and ventilation is minimal, so there is potential for the electricity use in the building to be completely met from the renewables, although this will be highly dependent upon the use of office and other electrical equipment by farm staff.

Hockerton Housing project, Nottinghamshire: Low-Carbon Housing

Hockerton is the UK's first earth sheltered, self-sufficient ecological housing development. The residents of the five houses generate their own clean energy, harvest their own water and recycle waste materials causing minimal pollution of CO₂ emissions. Water and energy savings total in the region of £1000 per household per year. The houses are amongst the most energy efficient in Europe. The houses were built by Hockerton Housing Partnership as a self build enterprise. A Co-operative has been established to manage and maintain the development. The five houses are on a South facing slope that overlooks a lake and wildlife pond. The houses are earth sheltered with a solar conservatory on the south aspect. Materials and technologies utilised

are low, to reflect the simplicity of design and general environmental impact. Minimising impact on the visual environment the houses are invisible from roads or points of public access. Minimal disruption was caused to land and flora during the development, and to increase the biodiversity 3,500 trees have been planted and more are planned.

The houses are highly insulated to substantially reduce heat loss through the fabric of the building to substantially reduce heat losses through the building fabric, earth covering reduces radiant heat losses in cold weather providing a more stable external environment.

Heat requirements are met by gains from solar radiation, electrical appliances and human body heat. In addition the houses are of a high thermal mass that, along with the earth sheltering, will act as a buffer to temperature changes. Hot water is provided by large water storage containers heated via a heat pump transferring heat from the solar conservatory spaces to the water, with back up from the renewable electricity (wind turbine) on site. The project is also self sufficient in water, both collection and treatment. Drinking water comes from rainwater collected from the on site conservatories whereas water for flushing and bathing comes from rainwater collected from other parts of the site. Sewage is treated in a reed bed that gives out into a man made lake. EC tests show that it meets bathing water standards. The project is being monitored by BRE and the EEBPP, interim reports considers the performance of the houses to be replicable and that the will of participants is an important factor in its success.

Sherwood Energy Village: Low-Carbon Regeneration

Sherwood Energy Village is a major initiative for the East Midlands transforming a 91-acre former colliery in Ollerton, Nottinghamshire into an environmental enterprise comprising industry, housing, recreation and leisure. The development will be constructed on environmental, ethical and sustainable principles, with on site developments complying with the highest environmental standards. The enterprise will benefit from the utilisation of renewable energy sources for the production of heat and power, thereby addressing concerns about global warming. A significant feature of the site will be its water management plan. Surface water will discharge into swales rather than traditional drains. Sherwood Energy Village is the first large-scale application of sustainable urban drainage in the UK and is in line with the government's recent Planning Guidance No.25. The scheme has been developed with support from the Environment Agency.

Housing

An area of 7 acres is allocated for housing, with a mixed tenure development of up to 80 dwellings including self-build, autonomous and energy efficient family houses, bungalows and flats. The housing area will be planned to provide a safe and attractive environment in which to live, and will be in a

sheltered position from other on site developments. Power will be from a wood chip biomass plant; see Broughton Pumping station, below.

Southampton Geothermal Heating Company: Low-Carbon District Heat and Power

The Southampton General Heating Company was set up in 1986 as a collaborative venture between the City Council and Utilicom, a French-owned energy management company, to exploit the geothermal resource located beneath the city centre. The initial scheme, serving customers from the geothermal well has expanded into a £4 million multi-source heating and chilling system, where the original well, which currently provides about a fifth of the systems heat input, operates alongside combined heat and power generators. These use conventional fuels to make electricity. The waste heat from this process is recovered for distribution through the 11 km mains network. The scheme has conventional boilers for top-up and standby needs. More than 20 major consumers in the city centre are served by the district heating scheme. They include the Civic Centre, four hotels, the Royal South Hants Hospital, Southampton Institute of Higher Education and an ASDA (formerly Gateway) superstore. After ten years of operation, the district scheme:

- Delivers more than 30,000 MWh of heat each year
- alongside 4,000 MWh of electricity sold from the generating plant
- 1,200 MWh of power providing chilled water on tap
- serves 20 major consumers in Southampton city centre (see main text on left)
- Circulating water is pumped around the city through 11 km of insulated service pipes within a 2 km radius of the heat station with just 0.5°C/km in temperature loss
- Offering substantial capital and operating cost saving to all consumers

CHP

The Wartsila 5.7 MW multi-fuelled CHP engine delivers heat and electricity saving over 10,000 tonnes of carbon (CO₂) emissions in the process. This engine is the primary energy source for the entire heating and chilling scheme and delivers supplies to all the following sectors:

Recreation

The Quays, the Eddie Read Swimming & Diving Complex was connected in June 1999 and benefits from heating and chilling supplies.

Shopping

West Quay development, the largest of its type in Europe, has at its heart the new shopping centre. The two anchor stores John Lewis and Marks & Spencer, plus the developer Hammerson, all take heating & chilling supplies.

A chilled water ring main will enable other retailers to meet their air conditioning needs via this unique initiative.

Electric Vehicles

SGHC's CHP generators now provide a green electricity recharging station for Council vehicles and those owned by Utilicom. There are plans to extend this though this does depend on finance.

Housing

The Holyrood estates CHP scheme was opened in 1996, 300 flats are heated by a 110kW CHP generator and boilers housed on site, other schemes are planned around the city. Barratt Homes have re-developed the former Polygon Hotel site into 108 private residential flats and will be taking heating supplied from SGHC. This supply is a first for private housing in the UK and SGHC were chosen not only because of the environmental benefits on offer, but also the significant cost savings compared to laying gas mains and installing boilers and plant. Southampton City Council has secured a Government SRB grant to develop a major new district heating scheme to the North West of the city. The scheme will deliver low cost heat supplies to businesses, schools and over 3000 council homes. This scheme could meet almost 1/3 of the City's target for CO₂ reductions, saving an estimated 80,000 tonnes of carbon emissions a year.

Waste

An Anaerobic Digestion plant is planned. The Council is currently looking for funding for this either from a Government Energy Programme or from the EU.

The following appear to be reasons for the success of the above schemes:

1. Continuous cross party support since the projects inception.
2. Strong and enthusiastic leadership from a council official who has been involved from the beginning.
3. A successful co-operation agreement with Utilicom. The French company had considerable experience in operating geothermal and CHP schemes and has brought its own funds into the project.
4. Local people have a good perception of the scheme as it is run by the local authority and not a large faceless utility company.
5. The authority has campaigned for stronger planning powers so that developers are forced to connect into their scheme. They hope that this will have been included within the outcomes of the PIU Energy Review.

Thameswey ESCO, Woking: Low-Carbon Energy Services Project

Over the past 12 years, Woking Borough Council has implemented a number of energy efficiency and environmental projects including: the UK's first small scale CHP/heat fired absorption chiller system; the first home energy rating bulk purchase condensing boiler scheme linked with energy conservation measures in private sector housing; the first local authority private wire residential CHP schemes; residential building PV cells.⁹⁸ Council refuse vehicles are powered by LPG and there are plans for all council vehicles to switch fuels. The borough is the most energy efficient local authority in the UK having achieved an NHEF 7 for its public sector housing stock and being half way to reaching NHEF 9. The council has an energy reduction target of 40% between 1991/1992 and 2001/2002. Achievements against target in 1999/2000 are shown below.

Energy consumption savings	118,864,195 kWh	36.9% saving
CO ₂ emission savings	64,310 tonnes	56.6% saving
NO _x emission savings	233.4 tonnes	60.3% saving
SO ₂ emission savings	677.7 tonnes	58.8% saving
Water consumption	267,157,000 litres	43.3% saving
Energy and water budgets	£3,956,187	

The above are on properties where the council pays the bills, so saving experienced by tenants are not included. An Energy Services Company (ESCO), Thameswey Energy Ltd, has been founded as a joint venture between Woking Borough Council and a Danish Green energy company, Hedeselskabet Miljo og Energi. The company has built a CHP/absorption cooling with heat, chilled water and HV/LV private wire network in Woking town Centre. The network serves Civic Offices, the Victoria Way car park, 2 hotels, a leisure complex, a nightclub and the HG Wells suite.

In addition, the first commercial fuel cell CHP system was installed and energised in Woking Park last year. The 200kW_e phosphoric acid fuel cell system will provide power, heating and cooling for the Pool in the Park/Leisure Lagoon swimming pool complex and for Woking Leisure Centre. The new fuel cell system, together with a low-temperature heat-fired absorption chiller and solar energy PV screening, is installed at the swimming pool complex to complement an existing conventional CHP system rated at 150kW_e. A new conventional 800kW_e system, a high-temperature heat-fired absorption chiller and a thermal store will be located at the Leisure Centre. Overall, this will give a total CHP capacity of 1.15MW_e, interconnected by heat mains and private wire. The quadgeneration fuel cell system is planned to produce electricity, low-grade heat for swimming pool water, high-grade heat for heating systems, and chilled water, via the absorption chiller, for cooling and air conditioning. The fuel cell installation will be set up in a special enclosure visible to the public from a viewing area; a permanent

⁹⁸ Jones, 2002

display will show how new & renewable energy can be integrated with existing green technologies, though this has not yet been finished

The Thameswey concept is intrinsically linked with deregulation in the UK energy industry. It uses a novel financing mechanism whereby expensive new technology is funded by combining it with more economic existing green technologies and making use of current Exemption Regulations. Higher plant costs make green energy more expensive than conventional energy. However, Thameswey can provide green energy services at the same price thanks to payback on green plant from the sale of heating, cooling and electricity. In addition the embedded nature of the system with customers close to the point of generation mean that transmission losses are avoided. In the case of the Woking Park project, the cost of the new system will also be diluted by its integration within a larger green energy scheme in Woking, which Thameswey hopes to implement.

In addition to DTI support, BG plc and the US Department of Energy are sponsoring the Woking Park venture. A separate DTI-funded monitoring project will track the project from planning and development through to installation, operation and maintenance, to learn how Woking Borough Council has been able to implement green technology project "firsts". The monitoring report should provide information that helps future implementation of fuel cell CHP schemes and projects harnessing other new & renewable energy technologies. Both the projects will be self-sufficient in electricity as well as a net exporter of surplus power all year round. Initially, surplus will be exported to other Council sites to eliminate the Council's exposure to the Climate Change Levy. At the present time Woking is 85-90% power independent of the National Grid and hopes to increase this to 100%. In effect the system operates 'out of the grid', since Thameswey is an 'Exempt Licence Supplier' it is not subject to New Electricity Trading Arrangements (NETA) (as it does not export to the grid, surplus is sold over public customers).

The following issues are important in the success of the Woking Borough-led work:

1. The schemes have required a strong catalyst (the borough energy manager) to have the vision and the single mindedness to pursue the projects.
2. There has been continuous cross party support since the beginning. Councillors have been motivated by the desire for Woking to be 'Environmentally friendly'.
3. The Danish partner is a group with an energy focus, however it is funded by a Foundation in Denmark that was set up to provide funding for ethical and sustainable businesses. There are 850 members who take no profits, their membership fees fund this 'business charity'

to provide money for innovative projects. There is no English equivalent, except maybe the Co-op bank but not really. It was only this Danish partner that has made it possible for these projects to go ahead.

4. Thamesway ESCO owns the intellectual property rights for the way they have incorporated the technologies into their schemes. In this way they hope to protect themselves from The 'Utility Dinosaurs'. I do not know what implication this would have on future projects wishing to use this model.
5. The technology innovations are expensive. It has taken time for assets to be built up so that the authority could escape from central government financial controls and be able to fund these schemes.
6. It is looking to export this model to other areas, two ongoing projects are the Brighton redevelopment that URBED are doing and another in Camberley. There are more but these are not in the public domain yet.
7. Future projects are looking at the issue of waste and how green waste may be used for energy generation via anaerobic digestion. They are hoping for council refuse collection to be sorted post collection by the council and green waste to go for energy generation, recyclables to be separated etc. They are not thinking about incineration for this. Since the fuel cells produce water they are looking at how this can be supplied to local people.
8. No-one is paid any wages by Thamesway. All the people who work there are council employees whose job description includes some of the ESCO work. In this way they are very flexible to second expertise when needed.

The ideas are very innovative, subversive is the wrong word but this is a genuine example of a town opting out of the traditional method of supply and generation so that profits go back into capital projects and towards reducing the cost of 'green power' for local businesses and people. Woking are trying to export their model to other communities. The number of sites makes this a good example of localised embedded generation. In addition future plans with the waste strategy show a very 'joined-up' way of thinking about the problems.

Household and Individual Initiatives

The US Safeclimate website includes examples of individuals who have taken personal steps to reduce their own carbon emission footprint.⁹⁹ This includes actions on transport, food & drink, paper, housing, and so on. Michael Totten, aged 50 from Takoma Park in Maryland cycles 25 miles to and from work every day, eats organic vegetarian food, has reduced the purchase of drink containers by 90%, invests in rainforest protection as presents to friends & family, and so on. Michael states that: "My job takes me around the world

⁹⁹ www.safeclimate.net/action/stories

working on biodiversity preservation, ironically causing the largest share of my carbon footprint to be emissions from air travel. Unfortunately, my frequent plane trips swamp all my other attempts to conserve energy". In response, Michael donates 20% of his annual income to purchase offsets for his carbon footprint, thereby helping to soak up as much carbon as he is responsible for producing in one year.

Chapter Five: Experience of Low-Carbon Initiatives in Other Countries

5.1. European Initiatives

The role of the local governments of the European Union in energy management differs considerably between each member state. Some local governments still have direct responsibility for the utility, still control the transportation system and are responsible for water supply and sewerage. Others, like the UK, have very limited power in these areas with transport privatised, the utilities privatised, and water supply and sewerage privatised. Whilst the European Union has policies to encourage greenhouse gas emissions reductions they also have policies to encourage privatisation of the energy supply industry. These two policies may sometimes be in conflict, and in the case of the UK, have resulted in missed opportunities to reduce greenhouse gas emissions. A few examples illustrate what can be achieved in an institutional context where the local authority has a greater level of ownership and control.

In Saarbrücken Germany) the local authority has control of local energy generation. It decided not to close its coal fire power station but to refurbish it with state-of-the-art emissions control, install district heating and sell both electricity and hot water to people in industry and the city. With the profits from the electricity sales they then subsidised the public transport system. In this way greenhouse gas emissions were reduced by efficient electricity generation. They were further reduced by having a good quality public transport system, affordable, via a subsidy from the utilities.

In Barcelona, a local solar ordinance was introduced in 2000. This required any new office building to have a proportion of its hot water supply from solar energy. There are several other examples of the different powers and responsibilities of local government and more information can be found on the Energie - Cites web site, at <http://www.energie-cites.org/>

Case-Study of The Netherlands¹⁰⁰

The National Policy Scene

A range of actors - national government ministries (Economic Affairs, Environmental Affairs), academic research institutes, advisory committees (Energy Council, Social-Economic Council) are all in some ways involved in initiatives related to a transition to a low-carbon

¹⁰⁰ with thanks to Peter Hofman, Centre for Clean Technology and Environment Policy, University of Twente, Netherlands

future. Such initiatives are expressed in policy formulation, R&D programmes, individual research projects and policy advice. At the level of national policy a project group at the Ministry of Economic Affairs focuses on the transition to a sustainable energy supply.¹⁰¹ The concept of 'transitions' to more sustainable systems (in energy, transport etc.) is part of Dutch policy. At the academic level one initiative on transition to a low carbon energy future is the COOL (Climate OptiOns for the Long Term) project, funded by the Dutch National Research Programme on Global Air Pollution and Climate Change.¹⁰² Its main purpose is to set up "dialogues" between policy-makers, stakeholders and scientists in the Netherlands, in Europe and in Global forums. Another initiative is the development of an 'electricity technology roadmap' to see how the transition towards a knowledge-based economy and a sustainable society should be managed.¹⁰³ The road map is being developed by KEMA, a technical consultancy company; the project is supported by the Ministry of Economic Affairs and the Dutch Power Generators.

The Local Level

The Netherlands has national goals for CO₂ emissions but these have not been strictly translated to the lower administrative levels. Some provincial governments and municipalities have an active climate policy and others do not. Currently negotiations are taking place between national and lower levels to improve implementation at lower levels and to *disperse national funds for climate policy to lower levels*. However, in general, municipalities are not the leaders in CO₂ reduction initiatives; NGOs and companies are more likely to be taking some action. An overview of activities at the provincial and municipal level can be found on www.klimaatbeleid.novem.nl/ (in Dutch).

A partial exception occurs where the municipality has responsibility for the electricity utility as in Amsterdam. This enabled Amsterdam to vigorously promote the use of low energy lamps through the utilities rather than simply the city council. Many thousands of lamps were purchased by the general public through incentives from the utility. (By comparison, in Leicester, there was no such relationship with the electricity utility and the city council only had powers to sell low energy lamps to council tenants; several hundred lamps were sold at a reduced price through this scheme in the 1990's).

The following paragraphs are examples of local initiatives that involve shifting mixes of companies, municipalities and NGOs. 'Green electricity' is more popular amongst domestic and commercial consumers in the Netherlands than in the UK. From a population of 16m (cf. UK 60m), there are about 775K Green Energy users (cf. UK: 45K); they buy about 2700million kWh of green energy (about 2.8% of total electricity consumption) compared to only 740mKWh in the UK (149mKWh domestic and 591mKwh business).¹⁰⁴ The website from which these data are taken gives lists of agencies and companies that have chosen to use green electricity for their offices and activities (e.g. Siemens NL buys 30% of its electricity from green sources; Meppel District Council buys 100%). The fast rising market for green electricity is due to the liberalisation of electricity supply markets, strongly governed by the energy tax system in the Netherlands, which taxes fossil fuel-derived electricity; this favours green electricity (it is almost the same price as non-green). However, a decreasing proportion of green electricity is being met from Dutch generating sources; imports are increasing, especially of wind energy from Germany where planning regulations concerning the

¹⁰¹ Website in Dutch is

http://www.ez.nl/beleid/ext_frame.asp?site=/beleid/home_ond/transitiemanagement/home.htm

¹⁰² website <http://www.nop.nl/cool/>

¹⁰³ http://www.kema.nl/live/ShowObject_follow_10784_id_340_unit_282.html

¹⁰⁴ <http://www.greenprices.nl/nl/usertop.asp?uid=1> ;
<http://www.greenprices.nl/nl/index.asp?lid=en>

establishment of wind farms are less restrictive than in the Netherlands (where there is considerable opposition to wind farms in many localities).

The Dutch branch of the **WorldWide Fund for Nature** is active both in green energy (with energy companies) and energy efficient housing (with project developers and municipalities).¹⁰⁵ With regard to renewable energy projects, municipalities are involved but often **energy companies** take the lead. An example is the 1 MW PV project in Nieuwland, Amersfoort that was initiated by the energy company REMU in collaboration with NOVEM (the R&D management office of the Ministry of Economic Affairs). The project includes PV panels on around 500 houses, in 1999 the largest PV project in the Netherlands. There is some information on the website of REMU (www.remu.nl) and some on the website of NOVEM under Amersfoort Walwoning (www.zon-pv.nl/pvinfo/home.html).

There are hundreds of CHP systems in the Netherlands and a massive 30-40% of electricity in the Netherlands is based on decentralised CHP. (By comparison in the UK it is just XXX percent, with a government target to increase it to 10% by 2010). Most of the CHP in the Netherlands is small-scale based on individual, large buildings but there is a movement toward neighbourhood schemes organised by the energy companies. The co-generation industry is represented by COGEN Nederland (www.cogen.nl)

5.2. The United States

Local government in the USA has historically played an important role in sustainable energy management, through ownership, or more commonly close regulation, of energy utilities.¹⁰⁶ State and city regulation of pricing has a strong tradition in the USA and led to development of least-cost planning and integrated resource planning, methods which have been exported to other parts of the world. In these approaches, the costs of reducing demand are considered alongside the costs of increasing supply and if smaller, then demand-side management (DSM) is the preferred option in terms of keeping costs down. Integrated resource planning has led to large subsidies on the purchase of energy efficient light bulbs and more efficient domestic appliances in some urban areas. The trend in the USA over the last decade has been towards privatisation and more competition, reducing regulation and oversight. Negative attitudes towards DSM from the energy business have come more to the fore, e.g. that it overly restricts commercial decision-making and reduces profitability. Utilities have pulled out of, or scaled-down, their energy efficiency investment programmes and have been focused more upon selling electricity as cheaply as possible. For example, discounts have been offered to existing large customers to maintain their business or to persuade them against developing their own CHP. Nevertheless, the long-history of local to state influence over electricity provision and DSM in the

¹⁰⁵ <http://213.136.5.108/wnf/website/index.cfm/id=BFF195B8-6385-4B3D-802DC7FFAA45DB6D>

<http://213.136.5.108/wnf/website/index.cfm/id=688E9169-AA96-4D46-8CE0F92469A2DD22>

¹⁰⁶ Fleming, P. (no date)

USA probably accounts for the (some what surprisingly) relatively high level of activity in that country on reducing carbon emissions, including participation in the CCP. A few examples are discussed briefly below.

Portland:

Portland was the first city in the US to adopt a local plan to reduce CO₂ emissions (1993), and has recently reasserted its carbon reduction efforts by introducing a *Local Action Plan on Global Warming 2001*.¹⁰⁷ The City Council, in collaboration with Multnomah County, have pledged to reduce greenhouse gas emissions by 10% from 1990 levels by 2010. Mitigation action is to be addressed by sector: energy efficiency in buildings, transportation, telecommunications and access, renewable energy resources, waste reduction and recycling, and forestry and carbon offsets. The success of the plan is to be monitored by an annual inventory and a bi-annual progress report.

Seattle:

The city of Seattle supports several carbon reduction initiatives.¹⁰⁸ *Delivering clean energy* is a project that aims to meet all increases in electricity demand through renewable sources of supply and energy efficiency measures. *Climate Wise* is a voluntary partnership programme for businesses to become involved in mitigation action. Benefits include free energy assessments, emission tracking assistance and public recognition. The city is also a member of the ICLEI 'Cities for Climate Protection Programme'. Voluntary reporting of greenhouse gas emissions is also undertaken.¹⁰⁹

5.3. Local Government and Climate Protection in Australia

Introduction

Since 1995, in the wake of a report by the National Environmental Law Association which suggested that local government could influence up to 50% of emissions of greenhouse gases, local authorities have been included in national policy.¹¹⁰ However, there had been no explicit actions which local authorities were supposed to pursue and no additional funding or initiatives to assist with this task. In 1997, at the *Pathways to Sustainability* conference in Newcastle, the Federal Minister for the Environment, Senator Hill, announced funding for the CCP programme of over two hundred thousand dollars. A few months later, in the lead up to Kyoto, this was increased to thirteen million dollars over five years, to establish a CCP Australia programme. The programme, it was argued by the Prime Minister, would "assist local government to identify ways of cutting greenhouse gas emissions", and then enable "local government to involve their community in helping to achieve these reductions".¹¹¹ This change of heart was in part a pragmatic realisation

¹⁰⁷ <http://www.sustainableportland.org/Portland%20Global%20Warming%20Plan.pdf>

¹⁰⁸ <http://www.cityofseattle.net/light/conserve/globalwarming/#early>

¹⁰⁹ <http://www.energie-cites.org/>
<http://www.iclei.org/>

¹¹⁰ Lumb 1994

¹¹¹ Howard 1997

of the need for local government involvement in order to address climate change, but also due to the lobbying efforts of local government organisations in Australia, and the demonstrated success of Newcastle City Council in addressing climate change locally.

The CCP Programme

The CCP-Australia programme was launched in 1998 as a joint partnership between the Australian Greenhouse Office (AGO)¹¹², ALGA and Environs, acting as a temporary agent for ICLEI before an office was established in Australia. Once endorsed, the programme experienced a faltering start as the division of responsibilities between these three different organisations became highly contested. Eventually, these tensions led to the withdrawal of ALGA from the programme. This has led to a more stable, though still difficult, collaboration between the AGO and Environs/ICLEI. In this partnership, Environs/ICLEI have taken on the roles of recruitment, providing training and technical assistance, and building political support. Achieving milestones one and two, that is, creating an emissions inventory and forecast, has been facilitated by the development of software by ICLEI for this purpose, and its purchase (by the AGO) and customisation for use in Australia. The resulting predictions of possible emissions reductions and financial savings are seen as crucial to the success of the programme.

In selecting an emissions reduction target and developing a plan of action, the CCP-Australia programme has not followed the model initially used by ICLEI of providing councils with 'best practice' examples from around the world and letting them develop a programme of action to suit their own circumstances. Instead, the AGO has developed Australia-specific 'local action modules' for implementation in different policy sectors, and has provided detailed examples of Australian 'best practice' for councils to mould to their own circumstances.¹¹³ Examples of 'action modules' include a programme for implementing in-house energy efficiency, which Newcastle City Council has developed, and the 'emissions reduction incentive programme', whereby financial assistance in proportion to emissions reductions achieved is available to assist in the implementation of measures across different sectors, though local governments must provide at least 50% of the funding required.¹¹⁴

To date, the CCP-Australia programme has attracted more than 150 local authorities, accounting for almost 60% of Australia's population. Its rapid growth and spread throughout the different states in Australia is clearly due to the high level of resources which have been provided by the federal government. This has funded the CCP office of seven staff and provided financial incentives for not only signing on to the programme, but taking action to reduce emissions of greenhouse gases. In its 2001 monitoring report, ICLEI Australia claim that between July 1999 and July 2002 the programme will have led to¹¹⁵:

¹¹² The Australian Greenhouse Office was created in 1998 as a dedicated branch of Federal Government dealing with climate change issues.

¹¹³ AGO 1999a, 1999b

¹¹⁴ AGO 2001

¹¹⁵ ICLEI 2002

- A reduction in CO₂ equivalent to 295,383 tonnes
- The investment of A\$1.8 million in jobs
- The investment of A\$32 million in abatement measures

While the focus of initiatives remains on 'in-house' operations, such as building retrofits, greenpower (renewable) supply and vehicle fuel conversion, some community initiatives involving education programmes and the implementation of planning regulation for energy efficient buildings are also being undertaken.

Strengths

- Integrated and informed analysis of key issues
- Adoption of a medium to long-term perspective
- Ambitious, but realistic, objectives
- Analysis of, and strategies for, the *transition* to decarbonisation
- Organisational and institutional commitment and backing
- Provision of significant levels of resources from central government
- Potential for social and policy learning and sharing
- Ancillary benefits with respect to other (non climate change) policies and initiatives

Weaknesses

- Focus remains on in-house activities where emissions are measurable and financial savings clear. Whether the approach can be translated into community initiatives more broadly remains to be seen.
- Integration with state/federal initiatives is patchy

Opportunities

- Significant emissions reduction potential if applied to community initiatives

Threats

- Powers of local government vs. state governments are weak in areas of resource management, transport and planning. Whether the programme contains sufficient weight to affect business as usual in these sectors is unclear.
- Funding was given over period 1997-2002. Whether this will continue is unclear, and implications for its withdrawal have yet to be considered.

The level of community and stakeholder involvement in the CCP-Australia programme is unclear, and further research is needed to show how far the programme is being supported and implemented across these sectors.

Case-study: Newcastle City Council

Newcastle is an old industrial town on the coast of New South Wales (NSW), about 300km north of Sydney. Since 1990, the city council has been addressing energy efficiency issues, and in the mid-1990s began to think of these initiatives in explicit 'climate change' terms. Some examples of these projects in the fields of energy management and transport/land-use planning are given below.

Energy Management

- ◆ In 1995 the Environmental Management Department began to co-ordinate energy efficiency measures under the 'green energy project'. This involved the creation of data on energy use and costs, and establishing a fund, based initially on a loan from the council, for implementing various efficiency measures. Any financial savings made are used to pay back the loan, and to fund new projects.
- ◆ The 'Illumination Newcastle' project. Renewable energy demonstration projects have been used to light historic monuments in the city. The first of these was the installation of a wind turbine at the entrance to Newcastle harbour, Nobby's Head, in 1995, the power from which was then used to light Fort Scratchley, also located at the harbour entrance. This had particular symbolic potency given that the harbour is still primarily used for the export of coal. Since then, other sites have been illuminated and a tourist trail has been developed.
- ◆ Innovation awards have been created for employees who suggest creative solutions to reducing resource use, and an education programme for all employees on energy and resource efficiency is planned.¹¹⁶
- ◆ Climate change considerations have been integrated into Council policy and financial decisions, with a report on energy consumption and emissions of greenhouse gases included in the quarterly budget review process of the Council.¹¹⁷
- ◆ In 2000, the Council held its first 'Energy Town Meeting' with the purpose of initiating community action on climate change. The event was organised in collaboration with the Rocky Mountain Institute, USA (a centre known for its expertise in resource efficiency) and attracted nine-hundred participants, who recommended that the Council create a target for emissions reductions, develop an action plan, create a means of reporting on progress and provide information about how individuals could save energy.¹¹⁸

¹¹⁶ NCC 2001

¹¹⁷ NCC 2001

¹¹⁸ NCC 2001

- ◆ Collaboration was also undertaken with local industries, through the formation of the 'Greenhouse Action Partnership' (GAP). The resulting 'climatecam.com' was launched at the second Energy Town Meeting, held on July 4th 2001 which was declared 'Greenhouse Independence Day' in an explicit stance against the rejection by the USA of the Kyoto Protocol. Climatecam.com provides a means through which current emissions of greenhouse gases from within the Council and across the city can be monitored against targets set in the 2001 *Greenhouse Action in Newcastle (GAIN) Plan* and its target of reducing emissions by 20% across the city, and 30% within the council, below 1995 levels by 2008.

Although Newcastle's approach, which is summed up in their slogan "if you can't measure it, you can't manage it"¹¹⁹, is similar to the CCP-Australia programme and its emphasis on the need to quantify emissions and the impact of policy initiatives upon them, it differs in one crucial respect. In Newcastle, the emphasis has been on getting accurate, local data, while the CCP-Australia programme has developed software for creating emissions inventories and forecasts which can be used with data which refers to national/state-wide trends in consumption patterns, which are then scaled to the particular local authority in question. While the approach adopted in Newcastle has the disadvantages of being time consuming, potentially costly and reliant on the goodwill of industrial partners to supply the necessary data, it has the potential to create a more complete local emissions profile, and hence a more accurate picture of the impact of local policies on emissions of greenhouse gases.

Transport and land-use planning

- ◆ Principles of resource and energy efficiency, such as reducing the need to travel and building to high standards of energy efficiency, are included as principles in strategic planning documents as well as in specific development control plans.
- ◆ For example, the Council, in collaboration with the local builders federation, has recently created a DCP governing the energy rating of new housing development. This has been modelled on the generic DCP developed by the 'Energy Smart Homes' programme run by the NSW Sustainable Energy Development Authority, and requires that all new housing should reach a 'home energy rating' of 3.5 (on the scale of 1-5). A similar DCP for commercial buildings is planned.

However, addressing climate protection in practice has been more difficult, due to the lack of influence of local government over transport and planning

¹¹⁹ NCC 2001, 33

policy, and contradictions which emerge between local economic development and environmental protection goals.

6. List of Individuals Consulted in Preparing the Report

David Adamson, BNFL plc
Alan Allsopp, Nottinghamshire CC Energy Agency
Kirk Archibald, EST
Graham Ayling, Severn & Wye Energy Agency
Derek Bateman, Cheshire County Council
Colin Beesley, Rolls-Royce
Peter Billins, British Biogen
Brenda Boardman, ECI, University of Oxford
Maggie Bosanquet, Durham County Council
Chris Brown, Igloo Regeneration
Steve Byers, Sheffield City
Ian Bryce, National Energy Foundation (Milton Keynes)
Kevin Corless, Energy Manager, VUM
John Costyn, Ofgem
John Cottam, Fylde Borough Council
Allen Creedy, Newcastle CC
Chris Cunningham, UMIST Energy Manager
Geoff Curtain, Durham County Council
Joanna Dawes, Greater London Authority
Lisa Dobbins, Welsh Assembly
Nick Dodds, URBED
William Edrich, Kirkless MBC
Jenny Fausset, Edinburgh CC
Martin Fodor, Bristol City
Mike Gallagher, Blackpool Hospitals Trust
Nigel Garrod, Onyx Sheffield
Peter Gray, TXU
Sheila Harris, Southampton City Council
Simon Harthill, Southampton City Council
Sarah Hayden-Binder & Fleur Rothwell, Global Action Plan
Jo Hefford, East of England Government Office
Peter Hirst, ENCAMS
John Holmes, Scottish Executive
Lorraine Hudson, Bristol CC
Allan Jones, Woking BC
Sheila Keating, EST
Victoria Lee, Yorkshire Forward
Quentin Leiper, Carillion plc
Ian Lings, North West Regional Assembly
Don Lack, Leicester CC Energy Agency
Peter Matejic, DTI
Anne MacGarry, Centre for Alternative Technology
Alice Marlow & Julia Brown, Birmingham CC
Margo Marshall, EST
F McEuan, COSLA (Committee of Scottish Local Authorities)
Laura McGadie, Lothian & Edinburgh Energy Partnership
Lisa Muggerridge, London Borough of Tower Hamlets
Alan Norris, Pilkingtons
Tanya Olmeda-Hodge, Country Land and Business Association (CLA)
Alice Owen, First Yorkshire & Humberside (RDA)
David Pickles, Newark & Sherwood District Council
Emyr Poole, English Partnerships
Helen Richardson, Renew North

Tim Rogers, Sheffield CC
Andy Rolland, EcoDyfi
Andrew Short, Manchester City Council
Adrian Smith, The North East Energy Initiative (TNEI)
Debra Smith, Groundwork Bridgend
Maf Smith, Furness Energy Partnership
Don Snow, Mandix Consultancy
Joshua Thumin, Greater London Authority
Joanne Wade, Association for Conservation of Energy
Jenny Wain, Sustainable Homes
Andy Wales, Interface
Ian Walker, Community Scotland
Steve Waller, Councils for Climate Protection & Nottingham CC
David Walsh, Daventry DC
Chris Waterfield, Red Rose Forest
Guy Winter, Scottish Executive
Mike Woolfe, CREATE (Wigan)

7. References

ACEA/EC (1998) CO₂ emissions from cars: The EU Implementing the Kyoto Protocol.

Allman, L, Fleming, P., Webber, P. & Lack, D. (2001), *Report on Assistance provided to the UK Councils for Climate Protection Pilot Authorities in Preparing Greenhouse Gas Emission Inventories*, Prepared for the Improvement and Development Agency (IdeA), De Montfort University & Leicester Energy Agency

Angel D.P., S. Attoh, D. Kromm, J. DeHart, R. Slocum & S. White (1998), The drivers of Greenhouse Gas emissions: what do we learn from local case studies? *Local Environment*, Vol 3 (3), 263-277.

Audit Commission, (1985) *Saving Energy in Local Government Buildings*, Audit Commission November

Australian Greenhouse Office (AGO) (1999a) *Local government capacity and powers in relation to Greenhouse reduction measures: survey of possible local government actions to reduce greenhouse gas emissions in the transport, residential and commercial/industrial sectors*, report for the AGO prepared by Brisbane City Enterprises September 1999, Commonwealth of Australia, Canberra <http://www.greenhouse.gov.au/lgmodules/survey.html>

Australian Greenhouse Office (AGO) (1999b) *Managing Energy in Local Government*, workbook prepared for the AGO, Commonwealth of Australia, Canberra, <http://www.greenhouse.gov.au/lgmodules/workbook.html>

Australian Greenhouse Office (2001) 'Emissions Reduction Incentive Program: module round 1', Canberra, Australian Greenhouse Office. <<http://www.greenhouse.gov.au/lgmodules/erip/index.html>> accessed December 2001.

Banister, D., Watson, S. and Wood, C. (1997) 'Sustainable cities: transport, energy and urban form', *Environment and Planning B: Planning and Design*, 24: 125-143.

Banister D., Stead D., Steen P., Akerman J., Nijkamp P. & Schleicher-Tappeser R. (2000) *European Transport Policy and Sustainable Mobility*. Spon Press, London.

Boardman, Brenda, personal communication, 22nd February, 2002

Bruff, G. and Wood, A. (2000) 'Local sustainable development: land-use planning's contribution to modern local government', *Environment and Planning C: Government and Policy*, 43 (4): 519-539

Cambridgeshire County Council (1997) *Environment 2000: A Strategy for Action*, Cambridgeshire County Council: Cambridge.

Cambridgeshire County Council (1998) *Cambridgeshire and Peterborough's State of the Environment Report 1998*, Cambridgeshire County Council: Cambridge. <<http://www.camcnty.gov.uk/eandt/soe98/contents.htm>> (accessed June 2001).

Cambridgeshire County Council (2000d) *Cambridgeshire Transport Plan 2001-2006: monitoring report 2000*, Cambridgeshire County Council: Cambridge.

Capello R., P. Nijkamp & G. Pepping (1999), *Sustainable cities and energy policies* Springer, Berlin.

Carbon Trust (2001), *Scoping R&D Priorities for a Low Carbon Future*, Imperial College Centre for Energy Policy and Technology

Commission for Integrated Transport (1999b) *Provisional Local Transport Plans*, Commission for Integrated Transport: London. <<http://www.cfit.gov.uk/reports/ltp/guide99/index.htm>> (accessed August 2001).

Commission for Integrated Transport (2002) *Paying for Road use*.

Competition Act 1998, c. 41, The Stationery Office

Counsell, D. (1998) 'Sustainable Development and Structure Plans in England and Wales: A Review of Current Practice', *Journal of Environmental Planning and Management*, 41 (2): 177-194.

Department of the Environment, Food and Rural Affairs, Home Energy Conservation Act 1995, <<http://www.defra.gov.uk/environment/energy/heca95/intro.htm>> (accessed February 2002)

Department of the Environment, Transport and the Regions (2000b) *Transport 2010: The 10 Year Plan*.

Department of the Environment, Transport and the Regions (2000c) *Valuing the external costs of aviation*. Published 12/12/00. <<http://www.aviation.dtlr.gov.uk/atwp/exvalue/index.htm>> accessed 22/08/01

Department of the Environment, Transport and the Regions (2000a) *Climate Change the UK Programme*. White Paper. Cm 4913 The Stationery Office.

Department of the Environment, Transport and the Regions (DETR) (2000a) *Planning for Housing*, PPG3, London: DETR.

Department of the Environment, Transport and the Regions (2000d) *Guidance on Full Local Transport Plans*, HMSO: London. <<http://www.local-transport.dtlr.gov.uk/fulltp/index.htm>> (accessed August 2001).

Department of the Environment, Transport and the Regions (2001) *Transport 2010: Meeting the local transport challenge*, HMSO: London. <<http://www.local-transport.dtlr.gov.uk/2010challenge>> (accessed July 2001).

Department for Transport, Local Government and the Regions (2001a) *Transport Statistics Great Britain: 2001*, Edition, TSO.

Department for Transport, Local Government and the Regions (2001b) *A Bulletin of Public Transport Statistics: Great Britain 2001 Edition*, SB(01)20, DTLR.

Devine-Wright, P., Chadwick, H. & Fleming, P. (2001), 'The Role of Regional Social Capital in Advancing Regional Sustainable Development', *Impact Assessment and Project Appraisal*, 19(2): 161-167.

DOE (1996), *Guidance for Local Authorities in England, Circular 2/96*, HMSO, ISBN 0 11 7532657

DTI (1999), 'Regional Development Agencies: Guidance to RDAs on Regional Strategies', London

DTI (1999a), 'Supplementary Guidance to Regional Development Agencies', London

DTI (2001), 'Regional Energy Consumption - Consultation Exercise', Energy Statistics Directorate, DTI, London

Easterling W.E., C. Polsky, D. Goodin, M.W. Mayfield, W.A. Muraco & B. Yarnal (1998), 'Changing places, changing emissions: the cross scale reliability of greenhouse gas emission inventories in the US', *Local Environment*, 3, 3: 247-262.

EC Expert Group on the Urban Environment (1996), *Targeted summary of the European Sustainable Cities Report for Local Authorities* Expert Group on the Urban Environment, DG XI.

EDAW, Alan Baxter Associates and Nigel Smith (2000) *Ashton Green Development Framework: growth, identity and sustainability* Draft Report, June 2000 EDAW

EMDA / EMRLGA (2000), *England's East Midlands Integrated Regional Strategy: Our Sustainable Development Framework*, East Midlands Development Agency

Enoch, M. and Potter, S. (2000) 'Local transport charges and taxes - learning from the leaders', *Town and Country Planning*, September: 256-8.

Evans, B. and Agyeman, J. (eds), (1994), *Local Environmental Strategies*, Longmans

Fergusson M. (2001) Bus services and the environment. In Grayling T. (ed) Any more fares? delivering better bus services. pp194-205. IPPR

Fergusson M. (2001) Analysis for PIU on Transport in the Energy Review. Working Paper at www.piu.gov.uk

Fleming, P. (no date), 'EU Implications of US Local Energy Management', Prepared for the German Marshall Fund

Fleming, P., Weber, P., Chadwick, H. & Devine-Wright, P.(2001), 'Greenhouse Gas Inventory', in Shackley et al., *Changing by Degrees: The Potential Impacts of Climate Change in the East Midlands*, Ashgate, Aldershot, pages 185-219

Friends of the Earth (1989), *Charter for Local Government*, London

GLA (Greater London Authority) (2002) *Energy Strategy*, London

Glaister S. (2001) UK Transport Policy 1997-2001. Paper to the Economics Section of the British Academy for the Advancement of Science, Glasgow, 4th September, 2001

Goodwin, P. (1996) 'Road traffic growth and the dynamics of sustainable transport policies', in Cartlede, B. (ed.) *Transport and the Environment: The Linacre Lectures 1994-5*, Oxford University Press: Oxford. 6-22.

Goodwin P. (2001) The Nine year Plan for Transport: What Next? Transport Planning Society Lecture, Institution of Civil Engineers, 14th June 2001.

Grant-Muller S (ed) (2000) Assessing the Impact of Local Transport Policy Instruments. Working Paper 549, Institute for Transport Studies, University of Leeds.

Guy, S. and Marvin, S. (2001) 'Local energy planning and electricity networks: disconnections and reconnections', in Guy, S., Marvin, S. and Moss, T. (eds) *Urban Infrastructure in Transition: networks, buildings, plans*, London: Earthscan. 143-159.

Hams. T et al (1992) *Environmental Good Practice Guide*, Local Government Management Board, Luton.

Healy, P. and Shaw, T. (1994) 'Changing meanings of "environment" in the British planning system', *Transactions of the Institute of British Geographers*, 19: 425-438.

HM Treasury (2001) Budget: March 2001, Chapter A Budget Policy Decisions (<http://www.hm-treasury.gov.uk/budget2001/fsbr/chapa.html>)

Hoban M. (1998) Integrated Transport Policy: Implications for Regulation and Competition. The July 1998 Transport White Paper and the 1998 Competition Bill.

Howard, J. (Prime Minister of Australia) (1997) 'Safeguarding the Future: Australia's response to climate change', statement, 20th of November 1997, Environment Australia, Canberra, <http://www.greenhouse.gov.au/ago/safeguarding.html>

International Council for Local Environmental Initiatives (1997) *Local Government implementation of climate protection: report to the United Nations*, Toronto, ICLEI

ICLEI (2002) *2001 Measures Evaluation Report* ICLEI, Australia
<<http://iclei.org/ccp-au/index.html>>

Ison, S. (1998) 'A concept in the right place at the wrong time: congestion metering in the city of Cambridge', *Transport Policy*, 5: 139-146.

Johansson B. & Ahman M. (2002) A comparison of technologies for carbon-neutral passenger transport. *Transportation Research Part D Vol7*, pp175-196

Jones, A. (2002), 'Woking: Local Sustainable Community Energy', Woking Borough Council, Woking Surrey.

Jones, E. and Leach, M. (2000) 'Devolving Residential Energy Efficiency Responsibility to Local Government: The Case of HECA', *Local Environment*, 5 (1) 69-81

Kates R.W., M.W. Mayfield, R.D. Torrie & B. Witcher (1998), Methods for estimating Greenhouse Gases from local places *Local Environment*, Vol 3, No 3, 279-297.

Leicester City Council (1994) *The Leicester Energy Strategy*, Leicester; Leicester City Council.

Leicester City Council (1996) *Home Energy Conservation Act Report*, Leicester; Leicester City Council Housing Department.

Leicester City Council (1999) *Environmental statement 1997-1998: an environmental statement for the Eco-Management and Audit Scheme (EMAS) for UK local government*, Leicester; Leicester City Council.

Leicester City Council, Leicestershire County Council and Rutland County Council (2000) *Planning for our future - looking ahead to 2016: Deposit Draft Structure Plan for Leicester, Leicestershire and Rutland* Leicester City Council, Leicestershire County Council and Rutland County Council www.leics.gov.uk/p_t/structure_plan/ accessed January 2001

Leicester Energy Agency (1999) *Leicester Energy Agency/Barnagel: Final Report to the European Commission* Leicester, LEA.

LGA (Local Government Association) (2001), *Community Leadership and Climate Change*, London.

Lindley, S., Longhurst, J., Watson, A. & Conlan, D. (1996), 'Procedures for the Estimation of Regional Scale Atmospheric Emissions - An Example from the North West Region of England', *Atmospheric Environment*, 30,17: 3079-3091

Lindley, Y. and Fleming, P. (2000) *Integration of renewable energy into urban planning: Ashton Green Renewable Energy Community* paper presented to the REBUILD conference, Barcelona

London Research Centre (1997a), *Atmospheric Emissions Inventory for Greater Manchester*, LRC, London

London Research Centre (1997b), *Atmospheric Emission Inventories for Four Urban Areas*, LRC, London

- Lumb, M., Buckley, K. & Auty, K. A. (1994) *Greenhouse action and local government: the new directions* (report prepared for the National Environmental Law Association), NELA, Melbourne
- Mander, S., Buchdahl, J., Shackley, S. & Connor, S. (2000), *Carbon Counting: Northwest England's First Inventory of Greenhouse Gas Emissions*, Sustainability Northwest, Manchester
- Marvin, S. and Guy, S. (1999a) 'Towards a new logic of transport planning?', *Town Planning Review*, 70 (2): 139-148.
- Marvin, S. and Guy, S. (1999b) 'Response', *Town Planning Review*, 70 (2): 156-8.
- May A.D., Shepherd S.P. & Timms P.M. (2000) Optimal Strategies for European Cities. *Transportation Vol27*, n3, pp285-315
- May A.D., Shepherd S.P., Minken H., Markussen T., Emberger G. & Pfaffenbichler P. (2001) The use of response surfaces in specifying transport strategies. *Transport Policy Vol8* pp 267-278
- May A.D. & Matthews B. (2001) Initial Policy Assessment: Deliverable 4. PROSPECTS (Procedures for Recommending Optimal Sustainable Planning of European City Transport Systems). EC.
- McEvoy, D., Gibbs, D. & Longhurst, J. (1997), 'Assessing Carbon Flows at the Local Level', *Energy & Environment*, 8(4): 297-311
- McEvoy, D., Gibbs, D. and Longhurst, J. (2001) 'Reducing Residential Carbon Intensity: The New Role for English Local Authorities', *Urban Studies*, 38 (1) 7-21
- National Assembly for Wales (2000), *National Assembly for Wales Contribution to the UK Climate Group*, www.wales.gov.uk
- National Research Council (1999), *Our common journey: a transition toward sustainability* National Academy Press, Washington D.C.
- Newcastle (1996), 'Newcastle upon Tyne: Environmental Planning and Energy Saving Policies', www.eaue.de/
- Newcastle City Council (1992) *Energy and the urban environment: strategy for a major urban centre Newcastle upon Tyne, UK*, Newcastle: Newcastle City Council.
- Newcastle City Council (1997) *Energy and the urban environment: five year review*, prepared with the support of ETSU for the DTI, Newcastle: Newcastle City Council.
- Newcastle City Council (1998) *Newcastle upon Tyne Unitary Development Plan*, Planning and Transportation, Newcastle: Newcastle City Council.
- Newcastle City Council (2000) 'Improving the local environment and public protection - targets for April 1999 to March 2000' report to the Environment and Public Protection Select Committee, Newcastle: Newcastle City Council.

Newcastle City Council (2001a) *Greenhouse Action in Newcastle (GAIN) Plan*, Newcastle, Newcastle City Council.
<<http://www.ncc.nsw.gov.au/enviro/ameif/climatecam/gainplan.htm>> accessed December 2001.

Nijkamp P. & A. H. Perrels (1994), *Sustainable cities in Europe* Earthscan Publications, London.

OECD (1995), *Urban Energy Handbook: Good Local Practice*, OECD, Paris

Owens, S. (1992) 'Energy, Environmental Sustainability and Land-Use Planning', in Breheny, M. (ed.) *Sustainable Development and Urban Form*, London: Pion. 79-105.

Owens, S. and Cowell, R. (2002) *Land and Limits: Interpreting Sustainability in the Planning Process*, Routledge: London. (forthcoming)

Patterson J. (1998) Positive environmental impacts of high-speed rail: air emission reductions from aviation. **Rail International** Vol29, pp232-235

Patterson J. & Perl A. (1999) The TGV Effect: A Potential opportunity for reconciling sustainability with aviation. **World Transport Policy and Practice** Vol5(1) pp39-45

Peake S. (1994) *Transport in Transition: lessons from the history of energy*. Earthscan, London.

Pearce B. & Pearce D. (2000) Setting environmental taxes for aircraft: a case study of the UK. CSERGE Working Paper GEC 2000-26, University of East Anglia.

Pemberton, S. (2000) 'Institutional governance, scale and transport policy - lessons from Tyne and Wear', *Journal of Transport Geography*, 8: 295-308.

PIU (2000), *Reaching Out - the Role of Central Government at Regional and Local Level*, Cabinet Office, London

PIU (Performance and Innovation Unit) (2002), *The Energy Review*, Cabinet Office, London

Potter S. (2001) Cutting CO₂ emissions from personal transport: a consumption systems approach.

Potter S., Enoch M. & Fergusson M. (2001) Fuel taxes and beyond: UK transport and climate change. Report for the World Wildlife Fund and Transport 2000

RCEP (Royal Commission on Environmental Pollution) (2000), *Energy: The Changing Climate*, HMSO

Regional Assembly for Yorkshire & Humberside (2001), *The Regional Sustainable Development Framework*, Wakefield

- Roberts, I. (2000) 'Leicester Environment City: learning how to make Local Agenda 21, partnerships and participation deliver', *Environment and Urbanization*, 12 (2) 9-26
- Romm, J. (1999), *Cool Companies*, Earthscan, London
- Rydin, Y. (1998) *Urban and Environmental Planning in the UK*, London: Macmillan.
- SPRITE (2002) Final Technical Report. EC
- Strategic Rail Authority (2002) The Strategic Plan. SRA, London
- TNEI (The Northern Energy Initiative) (2000),
- Tuxworth, Ben (2002), 'Local Government and Climate Change', presentation to CCP meeting, March 2002
- Vigar, G. (2000) 'Local "barriers" to environmentally sustainable transport planning', *Local Environment*, 5 (1): 19-32.
- Winter, P. (2001a) 'Sustainable housing - the legal context. Part II: environmental assessment, planning obligations and the Building Regulations', *Town and Country Planning*, February: 50-53.
- Winter, P. (2001b) 'Sustainable housing - the legal context. Part I: land assembly and development plans', *Town and Country Planning*, January: 26-28.
- Wootton, J. and Marsden, G. (2001) *The Local Transport Plan Submissions*, report to the Public Policy Committee of the RAC Foundation: Transportation Research Group, University of Southampton. <<http://www.trg.soton.ac.uk/news-features/ltp/ltp.htm>> (accessed August 2001).
- Yorkshire Forward (2001), *Regional Action Plan for the Yorkshire and Humber Economy*, 21 November, Leeds

Appendix One: The Players

1. Actors, Agencies and Programmes in the Low-Carbon & Sustainable Energy Field

There are currently a host of organisations, both governmental and non-governmental, working in the area of sustainable energy and energy efficiency. Whilst it is fairly straight forward to identify the roles of each organisation it is less obvious how, or even if, activities are co-ordinated between them. This chapter is intended as a brief overview of the principal government organisations involved in energy efficiency programmes and in promoting better demand side management of energy use. These organisations are also amongst those best placed to influence, help fund and help achieve local and regional decarbonisation targets. As only an overview is given, the list is not complete or exhaustive. The organisations form a complex web, which is evolving, with both new organisations and change in the names of programmes. Those involved in supply side management and, in particular, those promoting 'green' energy generation are also covered. There are a raft of other EU organisations and programmes, which are not covered

There are three main government departments, which are involved with energy issues: the Department of the Environment, Food and Rural Affairs (DEFRA), the Department of Trade and Industry (DTI) and the Department of Transport, Land-Use and the Regions (DTLR). All receive funding from the Treasury. Broadly speaking, demand side issues (energy efficiency programmes) are the domain of DEFRA and supply side issues (energy generation) are the domain of the DTI (the split mainly due to historical reasons rather than a positive choice). Planning, local to regional authority policy and transport issues are the domain of the DTLR.

2. Relevant Government Legislation

There is little direct and specific government legislation covering sustainable use of energy. One example is:

Home Energy Conservation Act 1995 (HECA): This was introduced as a Private Members Bill and given Royal Assent in 1996. It requires "all UK local authorities with housing responsibilities to prepare, publish and submit to the

Secretary of State an energy conservation report identifying energy conservation measures, which it considers practicable, cost-effective and likely to result in a significant improvement in the energy efficiency of all residential accommodation in the area" (DEFRA website). The Act covers all residential accommodation across all ownership and tenure. Measures can include information, advice, education and promotion as well as making grants or loans and carrying out works. The report should include an assessment of the extent to which emissions of CO₂ will be reduced as a result of the measures. The Energy Conservation Act 1996 extends the definition to include houses in multiple occupation.

Guidance issued by the Department of the Environment in 1996 (DOE 1996) defined 'significant' improvement in energy efficiency as 30% and advised local authorities to show a strategy for making at least substantial progress towards the 30% target over a period of 10 years, from a 1996 baseline. A number of local authorities translated the 30% gain in efficiency to an equivalent target reduction of 30% in CO₂ emissions from all housing over the next 10 years, a highly ambitious target. The guidance also "recognised the classic enabling role of local authorities, encouraging a multi-disciplinary and corporate approach to the development of energy efficiency strategies for residential accommodation, suggesting that authorities explore the scope for partnerships with schools, local businesses, etc." (DEFRA website).

Crucially, the government did not make new resources available to local authorities in order to implement the Act, except in respect of the one new duty, the preparation of the energy conservation report (£3 million being made available in total). The government felt that the provisions of HECA draw and build on existing powers and duties. As there are no new powers of entry or powers to require others to undertake work in private sector housing, authorities should be encouraging others to do the work and to develop partnerships in order to lever in private finance to assist in implementation. The Government did, however, provide the EST with funds under the HECA Action Programme to 'pump-prime' HECA-related projects (see below).

The Government has provided local authorities with a copy of a spreadsheet package (developed with the Building Research Establishment) to help them assess the energy efficiency performance of residential accommodation and to identify measures which are likely to bring about significant improvement in energy efficiency.

By mid-1997 all 468 local authorities in the UK had sent their energy conservation reports to Government. Progress reports have been provided by local authorities in subsequent years as part of the Housing Investment Programme (HIP) process. The local authorities indicated that a target improvement of just under 30% in domestic energy efficiency was feasible by

2008 (12 years from the baseline), with the potential to create up to ¼ million jobs and to 'significantly reduce emissions of CO₂', though the amount was not quantified. The target for England has been re-formulated as 30% in 10-15 years, with significant progress expected in 10 years, whilst the target-value remains 30% in 10 years for Scotland and Wales, and 34% in 10 years for Northern Ireland (due to expected changes in the fuel mix).

By July 1997, there had been stated improvement in efficiency of just under 1%, and by mid-1998 this had increased to between 2 and 2.5%. DEFRA comments that: "It is soon to take informed decisions about the prospects of authorities achieving HECA targets – the level of confidence in some data supplied remains open to question and not all data streams have been fully developed – but it is evident that authorities will need to increase their energy efficiency activity across all sectors of housing to do so" (DEFRA website). Several local authorities we consulted considered it to be quite unlikely that the HECA target of a 30% improvement in efficiency and/or a 30% decrease in CO₂ emissions, would be met at current rates of improvement. The most active authorities do appear to have achieved some impressive reductions, however, e.g. Kirkless MBC reports 12% improvements between 1996 and 2001.

Building standards legislation are also extremely important.

3. Funding Mechanisms and Sources

Until recently, a major source of funding for renewable energy was the Non-Fossil Fuel Obligation (a levy on electricity prices). Originally, it was conceived to support the nuclear industry but it has had a major effect on the development of renewable technologies in the UK. It has now been terminated and replaced by a Renewables Obligation mechanism, whereby electricity supply companies must provide 10% of their electricity from renewable sources by 2010. Failure to do so will require the supplier to purchase a Renewable Obligations Certificate (ROC) at a cost of 3p per kw/h. The money so raised will be returned to the supply companies which have succeeded in meeting the 10% target, so providing a double-incentive for firms to meet their target.

The second major source of funding is the Energy Efficiency Commitment which requires each electricity supply company to spend £1 per franchise customer on reducing electricity consumption, the cost being passed on to the consumer. The schemes have to be agreed with OFGEM and the Energy Saving Trust and the SOP provided a major part of the Trust's energy savings. Such projects included trade-in schemes, e.g. a programme called Fridgesavers was aimed at low-income houses with old inefficient fridges, whilst other schemes have promoted energy saving lamps to domestic

customers. From January 31st 2002, the EESoPs was replaced by the Energy Efficiency Commitment 2002-2005 (EEC.) The EEC 2002 - 2005 will follow on from the Energy Efficiency Standards of Performance (EESoP) programmes which began in 1994. It also forms part of the Government's Climate Change Programme and is highlighted in the Fuel Poverty Strategy. This will require electricity and gas suppliers to achieve targets for promotion of improvements in energy efficiency and will increase the levy on customers to £3 per year. The focus of the programme will continue to be lower income households, so addressing social and equity issues as well as energy efficiency. The government is setting the following targets for the EEC.

- 62 terra-watt hours (TWh) of fuel weighted energy benefits should be provided per supplier.
- At least 50% of this must be helping lower income consumers (many will be tenants of housing associations).
- Average annual financial benefit for those in low income groups of £14 per year by 2005 in lower bills on increased comfort.
- Average benefit for those outside priority group to be £8 per year by 2005.
- The EEC will cut green house gas emissions by around 0.4 million tonnes of carbon per year by 2005.

Ofgem will be responsible for apportionment of the EEC obligation between suppliers and for updating their individual targets. The targets apply to companies who have more than 15,000 customers and will apply from April 2002. Energy suppliers will be able to count energy efficiency improvements from all types of fuel towards their targets, irrespective of the fuel they actually sell. They are also free to make energy savings in any property, anywhere in Great Britain. They are not restricted to making savings only in their own customers' properties. The Government expects energy suppliers to have to invest up to £500 million in energy efficiency improvements over the three years of the scheme. **The Energy Efficiency Commitment for Housing Associations project**, supported by the *Housing Corporation* and the *Energy Saving Trust*, aims to maximise the opportunities for Housing Associations to access funds under the scheme. www.esd.co.uk/eec

4. Governmental & Delivery Organisations and Schemes

4.1. The EAGA

EAGA is a charitable Trust established in February 1993 by Eaga Ltd. Eaga Ltd was itself spawned by the Neighbourhood Energy Action (later renamed National Energy Action, NEA). The Trust has received donations totalling approximately £650,000 in four years. There are currently eight Trustees who

have a wide-ranging knowledge of economic, energy and social policies. The Trust's stated objective is "...the relief of fuel poverty and the preservation and protection of health by the promotion of the efficient use of energy." EAGA administers the Home Energy Efficiency Scheme (HEES) on behalf of DEFRA. EAGA also manages the Domestic Energy Efficiency Scheme (DEES) which operates throughout Northern Ireland. DEES is similar in operation to the HEES. It offers slightly less choice in terms of what work can be done, but has fewer restrictions in householders' eligibility.

4.2. The Building Research Establishment

BRE is the UK's leading centre of expertise on building and construction, and the prevention and control of fire. Their expertise, developed over the past 76 years, is available to all in the construction and associated industries, from multi-national companies and government departments to individual designers, builders and homeowners. BRE has around 350 professional research and consulting staff who operate within centres of excellence focusing on core capabilities. BRE is owned by the Foundation for the Built Environment, a non-profit distributing body that purchased BRE from the government in March 1997. This ownership lets the BRE remain independent from specific commercial interests, safeguarding their reputation for objective and impartial research and advice. BRE manages the UK Government's Energy Efficiency Best Practice Programme for domestic, commercial and industrial buildings through the Building Research Energy Conservation Support Unit (BRESCU)

EcoHomes

BRE conducts assessments at the design stage in a similar way to a SAP rating. Every house type on a site is considered, but the award is given for the whole development. This enables developers to use the result to promote whole sites – every house that is part of the development has the same rating. EcoHomes considers the broad environmental concerns of climate change, resource use and impact on wildlife, and balances these against the need for a high quality of life, and a safe and healthy internal environment. All the issues in EcoHomes are optional, making it flexible and enabling developers to adopt the most appropriate aspects of sustainability for their particular development and market. The issues assessed are grouped into the seven categories below:

Energy, Transport, Water, Ecology and Land Use, Pollution, Health and Well Being, and Materials. Other things from BRE include Envest (a software tool), sustainable transport, environmental bench marking for property portfolios and environmental management toolkits.

4.3. CADDET - Centre for Analysis & Dissemination of Demonstrated Energy Technologies

CADDET is the International Energy Agency's main vehicle for publicising its energy efficiency work. CADDET collects, analyses and disseminates

information on demonstration projects in energy efficient and renewable energy technologies. Working within the framework of the International Energy Agency (IEA), CADDET's objective is to provide impartial information about proven technologies to help accelerate their adoption in the market place. CADDET functions as two separate operations: CADDET Energy Efficiency and its sister organisation, CADDET Renewable Energy.

4.4. The Carbon Trust

The Carbon Trust (CT) was launched in March 2001 and was created to be a major element of the UK climate change programme. The trust aims to recycle £130 million receipts from the climate change levy (CCL), a tax charged per unit of energy supplied to industry and commerce. It will do this by developing a range of programmes to promote low carbon research and develop and help businesses to invest in energy efficient low carbon technologies. Currently, the CT has two major programmes operational, and a third due to be launched in early 2002; the focus is on the deployment of new and existing energy efficiency and low carbon technologies and renewables. The uptake of existing technologies is subject to different constraints to those faced by new or emerging technologies and this difference is reflected within the programmes.

Energy Efficiency and Best Practise Programme (EEBPP)

Set up in 1989 to collect together and disseminate impartial and expert advice on a broad range of established and emerging energy efficiency measures, the EEBPP also funds some research and development. The EEBPP is now incorporated into the Carbon Trust. Since 1990, it has stimulated energy savings worth an estimated £800 million per year. The programme:

- Produces case studies of projects, based on independent monitoring information. To date in the region of 400 case studies have been published.
- Produces good practice guides for use by professionals. Approximately 300 such guides have been produced.
- Produces sectoral energy consumption guides providing companies with data against which to bench mark their energy efficiency performance.
- Disseminates good practice to energy users and promotes wider take-up of proven energy efficiency measures.

All the above publications, in the region of 1100, are contained within a database that can be accessed via the EEBPP web site at www.energy-

efficiency.gov.uk. The database can be searched from a number of focal points, according to:

Building type

Agriculture Government estates Industrial buildings Hospitals Hospitality Housing Offices School

Industry/business area

Ceramics Chemicals Engineering Food and drink Foundries Glass Minerals Non ferrous metals Paper and board Plastics and rubber Steel Textiles Transport
--

Technology or techniques

Action energy CHP CCL Compresses air Design advice Energy Management Enhanced capital allowances Energy services Furnaces Industrial boilers International Motors and drives Process control Refrigeration Research and development Support to business Training and transport Transport

Published information aimed at the public sector covers energy efficiency within buildings such as schools, hospitals and leisure facilities. The numbers of publications are shown below:

Building Type	Publication type	
	Guidance	Case studies
Education	30	18
Hospitals	4	10
Leisure	13	6

All the above publications aimed at the public sector cover energy management and energy efficiency issues apart from three that look at the use of solar energy within schools

169 publications are aimed at the domestic housing sector, covering housing management and energy advice, and energy efficiency in new build and refurbishment. There are 7 publications so on the inclusion of solar energy and wider sustainability issues.

Enhanced Capital Allowance Scheme (ECA) scheme

Launched as part of the Climate Change Levy (CCL), the scheme aims to provide financial incentives to encourage businesses to invest in low carbon technologies and thus stimulate carbon savings.

The Low Carbon Innovation Programme (LCIP)

To be launched in early 2002, the Trust will provide a flexible support framework to develop new low carbon technologies.

4.5. Countryside Agency Renewables Initiative

4.6. CREATE - the Centre for Research Education & Training in Energy

CREATE is the leading organisation for co-ordinating and promoting energy education at all levels in the UK and organises an Energy Education Forum, to which the Foundation belongs. It runs EST-supported energy efficiency and management programmes in schools.

4.7. Department of Trade and Industry

The DTI has a responsibility for energy and energy policy including promotion of the oil and gas and other energy supply and distribution industries.

4.8. The Energy Saving Trust (EST)

The Energy Saving Trust is the leading organisation in the promotion of the efficient use of energy in the UK. The Trust was set up in 1992 as part of the Government's response to increasing concerns over the detrimental environmental effects of energy consumption, in particular global climate change. It is an independent and non-profit distributing organisation. The Trust is currently funded by DEFRA (£19 million for 1998/9) and the major UK energy companies - via the electricity Standards of Performance (now Energy Efficiency Commitment) programme. It runs a variety of energy efficiency schemes primarily targeted at the domestic consumer, most of which result in financial benefits. The DEFRA-funded activities run by the EST include:

Energy Efficiency - a long term national marketing programme to promote energy efficiency as a modern and socially acceptable way to save money and which sports a distinctive logo.

Energy Efficiency Advice Centres (EEACS) - 52 in total in the UK (see figure X). These receive additional funding from local authorities, charities and energy supply companies. They provide impartial and independent advice to consumers in the domestic and small business sectors.

Home Energy Conservation Act (HECA) Action - devised as a competition to encourage local authorities to meet their Home Energy Conservation Act

obligations. In its first four years, HECAction awarded grants worth over £15 million to more than 300 local authorities in the UK.

Energy Service Company Development (ESCO) - these companies offer customers packages of energy saving measures linked to the competitive supply of fuel.

Energy Advisory Service

Services offered to local authorities are: signposting to publications, projects and funding opportunities; directory of local authority energy offices; best practise case studies; newsletter and website www.easiest.org.uk

Condensing boilers - this scheme offered £100 cash back to owner-occupiers and private landlords who installed a condensing boiler.

Powershift - this programme aims to develop a sustainable market for alternatively fuelled vehicles in the UK.

Community Energy programme

A £50 million programme to support the refurbishment of existing and the installation of new community heating schemes, i.e. which link-up a number of different buildings. The initial bidding round was launched in January 2002 and expects to distribute £5 million to provide carbon savings, help to alleviate fuel poverty and reduce fuel costs for hospitals, universities and other community buildings. Local authorities, housing associations, hospitals and universities are all eligible to apply. The objectives over the two-year programme are to:

- Tackle climate change by reducing emissions by 150,000 tonnes per year
- Provide low-cost heat and electricity to hospitals, universities and other community buildings
- Meet the government's target of at least 10,000 MW of installed good quality CHP by 2010.

The Carbon Trust is managing the programme in partnership with the EST and operates throughout the UK.

www.est.org.uk/communityenergy

Affordable Warmth

DEFRA (in association with BG Transco) has created an "Affordable Warmth Programme" to support the installation of modern gas-fired heating systems in up to 1 million homes by 2007. Funding is also being provided to meet the demand for the extra heating engineers which the scheme will entail.

Other programmes include:

- * Schools energy efficiency programme
- * Heating controls
- * Cavity Wall insulation
- * Pensioners Energy Plan
- * High Frequency Lighting
- * NI loan action
- * Small scale Combined Heat and Power (CHP) in industry

4.9. The Energy Technology Support Unit (ETSU)

ETSU is an internationally recognised centre of excellence in energy and sustainable energy technologies. These range from clean coal to solar, wind and wave power and energy derived from biomass. Work is carried out under the ETSU banner as the de facto 'UK national energy agency'. For 20 years ETSU has delivered an impressive range of national and international programmes to customers worldwide. These include wide ranging dissemination and promotion of target information. ETSU works closely with the DTI. Part of AEA Technology plc, ETSU manages the UK Government's Energy Efficiency Best Practice Programme in commerce and industry on behalf of the Carbon Trust.

4.10. European Commission

There are many initiatives that come from the European Commission. These include the network of energy agencies in Europe, the renewable energy agencies, funding through Framework V & VI, Altener, SAVE, European Regional Development Fund and many other programmes. In many cases, UK programmes are part-funded by the European Commission. For example, many of the good practice guides produced by ETSU and BRESCU have been part-funded by the Commission.

4.11. Home Energy Efficiency Scheme (HEES)

Government provides funding each year for the HEES from the Comprehensive Spending Review to provide a range of energy efficiency measures in the most needy households. HEES grants are aimed at those households who are in receipt of at least one of nine qualifying benefits. A reduced grant is available to those not on a benefit but who are over 60 years of age. A full HEES grant provides up to £315 which can be spent on loft insulation, cavity wall insulation, upgraded heating controls or draught proofing and energy advice, low energy light bulbs and a hot water tank jacket. To date over 2.8 million families have benefited from a warmer home through HEES since 1991. This accounts for 10% of UK households. Prior to HEES, Local Authorities used to administer the "Homes Insulation Scheme" which gave grants towards loft insulation. HEES represents the largest single direct government expenditure on measures which are intended to reduce CO₂ emissions. [check]

4.12. Improvement and Development Agency (IDeA)

The Improvement and Development Agency, with support from DEFRA and the Energy Saving Trust, has established an 'energy efficiency help desk'. The Improvement and Development Agency was formerly known as the Local Government Management Board and represented the UK local government at the United Nations Conference on Environment and Development and produced many reports on Local Agenda 21 and energy efficiency. The IDeA is currently compiling a list of best practice case studies and is attempting to provide advice and information on energy efficiency and renewables to Local Authorities throughout England and Wales. (IDeA does not represent local authorities in Scotland or Northern Ireland).

Councils for Climate Protection

The IDeA has coordinated the pilot Councils for Climate Protection (CCP) work on measuring greenhouse gas emissions in 24 local authorities and will be involved in rolling-out the CCP inventory work to a larger sample of local authorities. The CCP process will eventually include 5 stages:

1. Establish based on greenhouse gas emissions
2. Set target for greenhouse gas emissions
3. Develop action plan to achieve target
4. Implement measures to achieve target
5. Monitor the success

4.13. Local Government Association (LGA)

The Local Government Association is the body that represents all local authorities in England and Wales. There are similar organisations in Scotland (Convention of Scottish Local Authorities, COSLA) and Northern Ireland (Association of Local Authorities in Northern Ireland, ALANI). In 1999, the LGA updated its energy policy with the publication of "Energy Services for Sustainable Communities". This clearly identifies renewable energy and energy efficiency as the way forward in terms of the national energy policy. In 2001, The LGA produced a guidance note for local authorities and chief executives entitled *Community Leadership and Climate Change*.

4.14. National Energy Action

A charity that develops and promotes energy efficiency services to tackle the heating and insulation problems of low-income households. Working in partnership with central and local government; with fuel utilities, housing providers and health services; and with consumer organisations, NEA aims to eradicate fuel poverty and campaigns for greater investment in energy efficiency to help those who are poor or vulnerable. Under the 'Energy Efficient Communities' programme, there are pilot projects running in areas where fuel poverty is recognised as a major social problem.

www.nea.org.uk

4.15. The National Energy Foundation (NEF)

The National Energy Foundation is an independent educational charity set up in 1990 and based at Milton Keynes in the UK. Its objective is to work for the more efficient, innovative and safe use of energy and to increase the public awareness of energy in all its aspects. Currently, its main activities include:

- Promotion of energy rating, notably through the National Home Energy Rating Scheme. (NHERS). This is carried out through a subsidiary company National Energy Services Ltd
- Management of the Energy Efficiency Advice Centre network on behalf of the Energy Saving Trust.
- Operation of the South Midlands Renewable Energy Advice Centre
- Manager of the Energy Efficiency Accreditation Scheme for organisations with high energy use.
- Encouraging introduction of renewable energy for the home (www.greenenergy.org.uk), schools and small business along with education and information.
- Development of the National Energy Centre to be located in Milton Keynes.
- A partner in the Milton Keynes Energy Agency established as part of the European Union's SAVE II programme.

www.natenergy.org.uk

4.16. Ofgem

Ofgem is the Office of the Gas and Electricity Markets and since privatisation of utilities supply in the UK has regulated the gas and electricity industries. Its energy efficiency tasks include liaising with Energy Saving Trust and DEFRA and administering the Energy Efficiency Commitment (2002 -5).

4.17. Conclusion

There are a wide variety of organisations involved in energy efficiency within the UK. These organisations are not only able to encourage efficient use of energy but they are well placed to encourage and support decarbonisation projects through the sustainable use of energy. These organisations are relatively uncoordinated and are changing at a relatively quick pace, there needs to be more coordination between the groups so that they can all work towards the same aim of sustainable use of energy and reduction in carbon emissions. Additional bodies are continually entering the area (i.e. New

Opportunities funding for renewables) and schemes regularly change their names.

References

<http://www.defra.gov.uk/environment/energy/index.htm>

<http://www.lga.gov.uk/>

<http://www.practicalhelp.org.uk/>

<http://www.idea.gov.uk/climate>

Appendix Two: Recommendations

We do not include here recommendations on national-level policy measures, which are required to promote uptake of low-carbon sustainable energy at all scales (e.g. reform of NETA, issues around embedded generation, support of renewables, improved building regulations, etc.). These are well covered in the recent energy review from the Cabinet Office.

Regarding organisation of work on sustainable energy at the local to regional scale

More co-ordination and rationalisation is desirable at the national scale, as the Cabinet Office review and RCEP have recommended. The Local Government Association and the Improvement and Development Agency have been working for a number of years looking at how to integrate energy and environmental considerations in to all policy areas. The most effective local authorities are the ones who have been able to identify the multiple benefits of energy efficiency and convince elected members of the non energy benefits to the local community. Such an approach is not yet apparent at the national level. Indeed, local authority energy managers are well aware of the many different organisations spending money on energy efficiency and there are many examples of two different government bodies funding very similar work. There needs to be a greater co-ordination between government bodies funding energy efficiency and the Local Government Association and the Improvement and Development Agency. With the proliferation of regional initiatives such as Community Renewables Initiative, DTI funding for renewables targets, New Opportunities Fund, European schemes, Energy saving Trust and Carbon Trust, it is very difficult to obtain a clear regional overview.

1. We recommend that Regional Sustainable Energy Agencies (RSEAs) are a possible mechanism for delivering improved integration. RSEAs would act as:
 - One-stop offices for information on initiatives within the region, including all local activities, organisations and partnerships
 - Strategic-level policy-making organisations for certain regional to local policies and programmes
 - Delivery agencies for particular regional activities, e.g. low-carbon technologies
 - Liaison bodies between local government and other local to regional partners, national government and the EU.
2. The evidence from local learning loops suggest that partnerships between existing leaders and authorities local to them, which are less, advanced may be one way forward. What we term the **Low Carbon Pathfinders** approach might initially pair-up a local authority involved in the Councils for Climate Protection (CCP) or some other low-carbon work with a neighbouring authority which has not been involved as yet in order to transfer experience and skills.
3. A further suggestion arising from the importance of local exemplars is that every local authority in the UK should aim to have show-case zero-emissions buildings preferably on an estate, or community, scale. In order to clearly demonstrate the benefits to the general public and stakeholders. These should be included in the plans of the Local Strategic Partnerships.
4. The Local Government Association and the Improvement and Development Agency have developed networks and informal groupings to address the broad issue of climate change and local authorities. This includes energy efficiency and local authority buildings. These networks have delivered substantial energy efficiency improvements, but without significant government resource to date. The Best Practice Programme should consider supporting these initiatives and working to achieve energy efficiency improvements in local authority

buildings through the existing structures. The local authority energy experts have a wealth of experience to provide to government bodies. By using existing local authority professionals, the government and its agencies could more effectively make use of public resources and provide more relevant recommendations than have sometimes been provided in the past.

Regarding Provision of Advice and Guidance.

1. Central government could be doing more to help through promoting low-carbon sustainable energy in the guidance, which it produces for local authorities. Local planning authorities cannot presently refuse development permission on the basis of sustainability criteria concerned with low-carbon development.¹²⁰ Stronger guidance from government is required to allow local authorities a stronger hand in facilitating low-carbon development.
2. Strategic briefings for Chief Executives and decision makers, following on the LGA guidance (2001), are important. The briefings should include presentations by leaders of councils who have already achieved non-energy benefits from their climate change approach. Briefings might be arranged by the LGA (recognised by local authorities) but supported by the Energy Efficiency Best Practice Programme (EEBPP).
3. Develop guidance specifically for local authority buildings and disseminate it through the Councils for Climate Protection (CCP) programme. The EEBPP could produce material aimed specifically at local authority buildings as part of the CCP approach.

Regarding Monitoring and Evaluation

Stage 5 of the CCP approach includes monitoring the progress towards the greenhouse gas emission reduction target. The CCP software aims to monitor the community as a whole, as well as local authority buildings, transport, waste production, etc. Further monitoring and target setting is required for individual local authority buildings and functions. Most county councils, unitary councils and large district councils employ their own energy management staff and have some form of monitoring and targeting system. This means that they normally have access to regular monthly, quarterly or (on large buildings) half hourly data about the energy and water use of their building stock. Small district councils often have less than 20 buildings and therefore do not employ specialist staff nor do they have specialist staff nor do they have specific monitoring and targeting software. There is a need for specific assistance to small District Councils.

The Best Practice Programme could consider developing a monitoring and targeting/information package for local authorities. Such a system could be CD-ROM or web based and provide a simple, accurate method of monitoring and target setting in small district council buildings that could be implemented in a relatively short time scale. The CD could also contain information relevant to the needs of the local authorities. Such a CD currently exists for businesses (the Self Help Energy Efficiency Business Advisor) and proposals have previously been made to the Best Practice Programme to develop a local authority version (SHEELA). Self Help Energy Efficiency for Local Authorities.

1. We recommend that the Best Practice Programme should consider commissioning self help efficiency for local authorities (SHEELA) that would provide a simple, easy to use monitoring and targeting system for small district councils and a reference resource for energy efficiency measures and contacts for suppliers.

¹²⁰ PPG25 does now provide local authorities with a stronger steer on deterring development in flood plains.

Regarding Funding

The major barrier that prevents most local authorities from implementing more energy efficiency measures is finance. The Best Practice Programme should consider working with the Local Government Association and Improvement and Development Agency to identify alternate methods of accounting for energy efficiency within the public sector. The end result would be an agreement with the treasury that 'spend to save' programmes would be advantageous to local government.

1. We recommend that the Best Practice Programme should commission work with the Local Government Association, Improvement and Development Agency, CIPFA and if appropriate the Research Councils to identify alternative financial arrangements to allow local authorities to 'spend to save'.

2. There is scope for the Best Practice programme to work with the Local Authority Research Councils Initiative (LARCI), set up in 1997, to provide more targeted research relevant to the needs of local authorities and to establish closer working between universities and local authority energy managers.

Regarding Training

Training is required at different levels:

- Strategic training for decision makers (members and chief officers)
- Ongoing continuing professional development for energy managers LA21 officers, etc
- Basic energy management training for technical officers
- General climate change/energy awareness for the general public, schools, teachers, etc.

1. Strategic training for decision makers could include short briefing sessions provided by experts in the field, including a leader of a council. Continuing professional development for professional officers should be aimed to bring them up to speed with current best practice and should be delivered as part of the CCP project. Again, this would include presentations from leading members and leading officers.

2. Training for technical officers should include all aspects of monitoring and target setting, energy saving opportunities and the type of measures that are normally implemented in local authority buildings. This would also include combined heat and power and opportunities for renewable energy. This material could be delivered as part of a number of one-day training sessions arranged by the Improvement and Development Agency and Local Government Association and delivered by local authority professionals.

3. Training material is also required to increase public awareness and for use in schools. The material for use in schools should be developed by teachers and should focus on how literacy and numeracy can be improved through using energy efficiency material rather than focusing solely on science and geography issues. By using energy related material to increase literacy and numeracy, teachers will place a greater educational value on it and it is more likely to be used.

4. Work should also be undertaken with the Research Councils. These are funding various Partnerships for Public Awareness programmes, which attempt to increase the public awareness of science. Many of these focus on energy efficiency and added value could be obtained for the Best Practice programme by working with local authorities and the Research Councils as part of Regional Public awareness/ consultation exercise to develop a public discussion on mitigation and adaptation opportunities.

MSc level material currently exists in this general area, e.g. the De Montfort University MSc in Climate Change and Sustainable Development. This course is aimed at local authority professional and has been developed with funding from the EPSRC and support from the IDeA, LGA, EST and leading local authorities. There are many other relevant courses and CPD training available. Training needs surveys have recently been undertaken by the Energy Saving Trust and by DEFRA looking at local Authorities and Energy Efficiency. The European Union has funded similar needs analysis. The results of these surveys should be used to develop targeted training packages.

5. The Energy Efficiency Best Practice Programme should commission work via the Local Government Association to advise them on how the aims of the Best Practice programme could be achieved through the local authority modernisation agenda.

Appendix Three: A Note on the Transport Sector

1. Trends, plans and targets

The transport sector accounts for approximately 25% of UK emissions of CO₂. It is the only sector in the economy where the baseline projection is for emissions to increase between 2000 and 2020.¹²¹ The scale of this increase is substantial with CO₂ emissions forecast to rise by more than 25%. Emissions of other greenhouse gases are forecast to increase even more quickly, namely nitrous oxide and hydrofluorocarbons.

The increase in CO₂ is driven largely by the continuing trend towards private motorised travel for individuals; the ever longer journeys for both people and freight; rapid growth in air travel and an almost total dependency on oil as a fuel source. The increase in nitrous oxide is a by product of the use of three way catalytic converters which reduce emissions of oxides of nitrogen. Hydrofluorocarbons are used in in-vehicle air conditioning units and their use is expected to increase.

The quantified reductions from trend in CO₂ emissions expected from the transport sector amount to 5.6MtC.¹²² The main policy for reducing emissions from transport is a voluntary agreement between the EU and car manufacturers which aims to reduce the average CO₂ emissions for all new cars sold in the EU to 140g/km by 2008, with a possible further target (to be reviewed in 2003) of 120g/km by 2012.¹²³ This agreement along with proposed changes in VED and potential changes in company car taxation, is forecast to produce a drop in emissions of 4MtC by 2010. The 10 Year Transport Plan¹²⁴ is expected to yield savings of 1.6MtC by 2010, through such measures as:

- sustainable distribution strategy
- 80% growth in rail freight
- local public transport improvements including extensive bus priority and up to 25 new rapid transit lines
- introduction of congestion charging in London and eight other cities and work place parking levy in 12 cities (it is further assumed that net revenues are invested in transport)
- 50% increase in rail passenger kilometres
- reliable, convenient and affordable public transport and better integration.

If the forecast savings are achieved then the growth in emissions from transport will have been slowed rather than stopped. At present there is some doubt as to whether the target savings will be achieved. For example, while growth in rail patronage has been strong in recent years, whether it will remain so in the light of safety concerns and the continued saga of Railtrack (in administration) remains to be seen. The Strategic Rail Authority¹²⁵ remain optimistic on delivering the growth in patronage, noting that rail patronage is forecast to grow by a third over the next ten years in the absence of further intervention. Other commentators have expressed doubts over the ability to deliver on ten year plan commitments and their appropriateness.¹²⁶ The transport sector is one of the more intractable when looking for reductions in emissions. At present the transport sector is heavily

¹²¹ DETR, 2000a

¹²² DETR, 2000b

¹²³ ACEA/EC, 1998

¹²⁴ DETR, 2000b

¹²⁵ SRA, 2002

¹²⁶ Glaister, 2001, Goodwin, 2001

dependent on technological developments in vehicle efficiency to deliver the bulk of the CO₂ savings. Offsetting these savings is the forecast growth in traffic. There is also a tendency to upgrade to vehicles with air conditioning, four wheel drive and enhanced safety features (adding weight) all of which increase fuel consumption. The average fuel consumption of new cars sold has not improved significantly since the early 1980s.¹²⁷ The long term challenge is substantial. There is also a commitment to the 10 year plan to deliver some savings, some of which will have to come from a behavioural shift away from car use. In this area it could be argued that the Government is delivering mixed messages:

- abandonment of the fuel duty escalator (1999), followed by a freezing of duties on fuel (March 2001) and reductions in duty of 2p on Ultra Low Sulphur Petrol (ULSP) and 3p off Ultra Low Sulphur Diesel (ULSD), with a cut in the unleaded petrol rate of 2p from 7/3/01 to 14/6/01.¹²⁸
- pressure to reduce new car prices, through the Department of Trade and Industry
- formation of the “motorists forum”
- a commitment to substantial new road building in the ten year transport plan
- an emphasis on choice
- enabling legislation on road user charging and the work place parking levy, delayed until the Transport Act 2000.
- continuing privatisation, Air Traffic Control, London Underground.
- Office of Fair Trading, emphasis on competition in the bus market, under the 1998 Competition Act: “Competition in the market is preferable to competition for the market”.¹²⁹

The ten year plan will, if implemented, reduce the growth in emissions in the UK. Achieving any reduction will be difficult in the short to medium term, while deeper cuts in the range of 60-70% can only be contemplated in the long run. There is wide agreement amongst transport professionals that an integrated approach is key, single measures implemented in isolation will usually have knock-on effects elsewhere and will be less effective than they could be in partnership with complementary measures. This is clearly illustrated by the current debates around the issue of road user charging in urban areas.

Charges in urban areas will reduce congestion and have environmental benefits in the charged area and will also raise revenue for reinvestment. But, in order to persuade people to use modes other than car, adequate public transport services must be in place before charging is introduced. Most urban public transport systems are already close or at capacity in the peak periods. There are concerns around equity, in particular the plight of poorer car dependent people. Boundary issues are also important as drivers could be incentivised to drive further to avoid charges and this could cause increased congestion and environmental disbenefits to those near the boundary. A key concern is the economic vitality of the centre and whether businesses will be disadvantaged. It is possible to expand this list further, but the point is clear that without a package of complementary measures, urban road user charging is not practicable. This is before consideration of the acceptability of such measures. The media coverage of the road user charging proposals for London and the recent Commission for Integrated Transport report¹³⁰ on road user charging has been largely hostile. Car use is often portrayed as an issue of personal freedom in such debates, an easy target being the “big brother” monitoring of vehicle movements.

An integrated approach is more difficult to develop in the current deregulated, commercial environment, where there is less scope for command and control measures. Commercial operators are responsible for the vast majority of public transport operation, buses, coaches,

¹²⁷ DTLR, 2001

¹²⁸ Treasury, 2001

¹²⁹ Hoban, 1998

¹³⁰ CfIT, 2002

planes, trains, light rapid transit and taxis. Therefore any integrated plans have to be implemented through cooperation and agreement. Formal co-operation by operators runs the risk that it may fall foul of the 1998 Competition Act.

2. Achieving Change

Extensive work has taken place to develop integrated transport strategies at the city level that meet a range of objectives, usually key amongst which are the relief of congestion and improvement of the environment. The relative effectiveness of individual measures has been reviewed.¹³¹ A range of projects have sought to identify the most effective combinations and the key constraints on implementation, which are usually public acceptability and financial feasibility.¹³² Recent European research projects have sought to address issues of sustainability in transport. Banister et al (2000) included a 25% reduction in CO₂ emissions as one of their policy targets for 2020. They conclude that while a range of different paths could lead to a more sustainable transport system, two aspects are key:

- decoupling the link between GDP growth and transport growth¹³³
- technology

and neither can succeed alone. The theme of decoupling has been pursued more recently in SPRITE (Separating the Intensity of Transport from Economic Growth), an EC funded project focussing on measures that could assist in reducing:

- transport intensity and/or
- unit environmental load

SPRITE also emphasises the need for an integrated approach¹³⁴ and within this framework identifies seven key measures as having the greatest potential to reduce transport intensity and environmental load:

- combined measures to change mobility-related attitudes and traffic behaviour
- car sharing as part of combined mobility
- controlled parking zones
- urban road pricing
- hydrogen fuel cell vehicles
- high speed rail
- road pricing for freight traffic

These were measure where the study was able to identify some evidence of the likely level of impact.

Another example of a big picture approach is that by Potter *et al*,¹³⁵ who use aggregate data from the National Travel Survey and other sources to assess the impact of national level policies and what would have to be done to achieve significant reductions in CO₂ emissions, up to factor 10. The authors estimate a business as usual scenario (continued growth in the number and length of car journeys, lower occupancy rates and an increase in vehicle efficiency) for travel by car would increase CO₂ emissions by a factor of 1.7. The authors

¹³¹ Grant-Muller *et al*, 2000, May & Matthews, 2001

¹³² May *et al*, 2000, May *et al*, 2001

¹³³ Peake, 1994

¹³⁴ SPRITE, 2002

¹³⁵ Potter et al. 2001, Potter 2001

consider a target for CO₂ reduction of 40%. If such a reduction were to be sought through improved vehicle efficiency only, then fuel economy would need to average 113 miles per gallon compared with current levels for cars of 31 miles per gallon.¹³⁶ This would imply that cars would need to be even more efficient given the higher consumption of goods and passenger service vehicles. Modal shift alone (car from 88% of motorised trips to 65%, bus to 25% and rail to 8%) sees CO₂ increase but by less than in the business as usual scenario. Note that this would be a very substantial change in travel patterns with bus use increasing by a factor of 2.5 and rail use four fold. The authors identify one (of many possibilities) for reaching a 40% target as follows:

- 30% increase in car and bus journeys (50% in BAU)
- halving the growth in trip length (except for rail which may pick up longer car journeys)
- increasing fuel efficiency of cars 2.75 fold
- modal shift as above.

It is clear that short of a switch to a non-polluting fuel source, a combined approach is required. Changes in behaviour will be key to any such developments. It is also clear that transport is an area where people are reluctant to change and perceive themselves as car dependent. Studies reviewed so far take an overview of the types of measures that might in combination achieve success. In the next section individual examples will be examined, for measures where there is some evidence on their impact. It is necessary to note that where modal shift is involved, estimates of emissions per passenger kilometre are also required. These estimates are heavily dependent on underlying assumptions regarding:

- vehicle technology, age and fuel source
- load factor.

Authors such as Potter and Fergusson¹³⁷ suggest that per passenger kilometre, a bus emits around half as much CO₂ as a car. By contrast, recent estimates produced for the Strategic Rail Authority (SRA) suggest that buses are more polluting than cars per passenger kilometre, while rail is distinctly superior.¹³⁸ The SRA analysis assumes a bus occupancy rate of 9 while the Fergusson figures were derived for London, where occupancy rates tend to be higher and were assumed to be 12.5. Once adjusted for load factor the emissions per bus are compatible. There is also a discrepancy in the car passenger emissions, which again may be related to occupancy rate assumptions, the SRA study uses the national average of 1.6, though the Fergusson paper does not provide the assumed car occupancy rate. National statistics show a national average load factor of around 10.9 in 2000 (for buses and coach services), this has declined from a level of 15.8 in 1980.¹³⁹ Were load factors to increase, the relative environmental performance of bus measured in per passenger kilometre or per passenger terms would also improve. When considering modal shift to bus, a key question is the required increase in bus vehicle miles and the occupancy rates that are assumed to be acceptable and achievable.

Examples

Many instruments of transport policy could make a contribution to the aim of reducing emissions of green house gases. Here some of those with greatest potential are discussed.

¹³⁶ DTLR, 2001a

¹³⁷ Potter 2001, Fergusson 2001

¹³⁸ SRA 2002

¹³⁹ DTLR, 2001b

High Speed Rail

High Speed Rail (HSR) services, defined as capable of speed in excess of 250km/h, exist in various countries of the EU, though not the UK. Work undertaken for the SPRITE project suggests that at the EU level a 4.7% to 5.1% reduction in aircraft kilometres (domestic and international), a 0.002% to 0.005% reduction in car kilometres and a 2% increase in train kilometres could be achieved through completion of the European High Speed TEN-T network. This could produce an annual saving in CO₂ emissions of 3.6 to 5.6 million tonnes per year.¹⁴⁰ Patterson and Perl and Patterson¹⁴¹ explored the impact of the TGV lines on domestic air travel, finding that at minimum the growth in air travel slowed and that for some flows, especially the shorter ones, such as Paris Lyon falls in air travel were recorded. HSR looks particularly attractive in terms of emissions in the context of France where nuclear has a high share of electricity generation.

Road user charging

The case for road user charging in the UK appears to be increasingly focused on congestion relief, partly because this is perceived to be the biggest cost imposed by transport and partly because it is the policy area where there is greatest public acceptance of the need for action and hence least hostility from motorists.¹⁴² Evaluation of the impacts of road user charges on carbon emissions is less developed. If congestion is reduced, this should result in fewer stops and starts and longer periods when the car operates at or near its optimum (hence most efficient) point. Carbon emissions per vehicle should be reduced for exactly the same journey. Utilising data from the London case, if urban road pricing were introduced in the 21 largest cities in Europe a 0.2% reduction in car kilometres could be achieved.¹⁴³

Pricing externalities of air transport

Air transport fuel is currently untaxed under international agreement. Various authors have examined charging regimes that might internalise the external impacts of air travel, for example, air pollution, green house gas emissions and noise. DETR (2000c) have recently issued a paper on valuing the external costs of aviation based on work by Pearce and Pearce¹⁴⁴. This paper suggests that appropriate charges per passenger could be around £3 (short haul) and £20 (long haul). This would increase short haul fares by approximately 3.5% and long haul by 6%. Assuming an elasticity of -0.8 demand would fall by 3% and 5% respectively.¹⁴⁵

Hydrogen

There is clearly long run potential for significant reductions in CO₂ through the use of hydrogen from renewable sources. Estimates suggest that a 20% market penetration in Germany would reduce emissions by around 5%.¹⁴⁶ It is expected that California will lead the way in this area. At present in the UK we are at the stage of demonstration projects for fleet vehicles. Westminster Council are operating two fuel cell vehicles, a taxi and a parks vehicle. Two schemes involving buses will be up and running in the next few years. The

¹⁴⁰ SPRITE 2002

¹⁴¹ Patterson and Perl (1999) and Patterson (1998)

¹⁴² CfIT, 2002

¹⁴³ SPRITE 2002

¹⁴⁴ Pearce & Pearce 2000

¹⁴⁵ DETR, 2000

¹⁴⁶ SPRITE 2002

CUTE project will be running 3 hydrogen powered buses in London. The USHER project will utilise solar power as the source for the hydrogen to fuel a bus in Cambridge, which should be on the road by 2003. This single vehicle could save up to 21.3 tonnes of emissions a year through replacing a conventional diesel vehicle (see data sheet for further details).

Vehicle Efficiency

A voluntary agreement has been reached between European car manufacturers and the European Commission to reduce CO₂ emissions from new cars by 25%, to 140 grams per kilometre by 2008. This agreement illustrates the technical potential for further improvements in efficiency of petrol driven cars. It is perhaps surprising that it is voluntary and not legislation as with the US CAFE standards, which succeeded in gaining efficiency improvements, but only so long as targets were set. US fuel economy standards are far behind those of Europe.

It is worth noting that petrol-electric hybrids are yielding up to 80 miles per gallon of petrol. However, the light weight aluminium framed diesel Audi A2 can also turn in this type of performance. Electric vehicles are increasingly used in urban areas to combat local pollution, often purchased as part of local authority fleets, e.g. Nottingham (see database for further details). In Oxford 20% of the Councils fleet is electrically powered, comprising 8 cars and 5 small vans. There is some consideration of options such as wind-power for recharging the batteries. Infrastructure for charging is a key to acceptance, Westminster offer free recharging at two car parks and free parking for electric vehicles.
