Leicester
City Council

Annex B

Second Draft Supplementary Planning Document

City Wide Guidance

ENERGY EFFICIENCY &

RENEWABLE ENERGY

Contents

Energy Efficiency & Renewable Energy

1.0 - Introduction

Purpose and Status of this Document

1.01 Initially this Document supplements policy in the Adopted City of Leicester Local Plan (1991 – 2001) [1] through the provision of practical advice on how to incorporate energy conservation measures and opportunities for the use of renewable energy in new development. It should be considered within the wider aims of the Local Plan and other relevant supplementary planning guidance.

1.02 This document also draws on the policies of the Replacement City of Leicester Local Plan (1996 - 2016)[3], which reflect recent Regional, National and International advice. When adopted, this plan will replace the current Adopted Local Plan (1991 – 2001). It is therefore expected that during 2006 the Energy efficiency & Renewable Energy Supplementary Planning Document will become supplementary to the Replacement Local Plan 2001 – 2011.

1.03 A variety of energy related measures, many with little or no cost implication can be incorporated into plans for development. Throughout the guidance sources of further information and assistance are given and these are summarised on page 21 -22.

1.04 This document gives guidance for both new and existing developments in how energy saving measures, and renewable energy developments can be incorporated, and the potential for renewable energy generation maximised.

1.05 Recent government advice is centred around sustainable development and this is the main focus of PPS1[20]. Energy efficiency and renewable energy are central to this wider theme, by reducing the impact on the environment of new and existing developments ensuring efficient use of resources. An implicit part of sustainable development and sustainable energy solutions is the whole life value approach; considering the impact and the economic cost throughout the life of a product or building not solely at the build stage. Additionally, ensuring that buildings are adaptable to future uses will avoid additional demolition and construction costs and conserve resources, including embodied energy.

1.06 The environmental arguments for reducing energy use and our concerns about dependence on fossil fuels are now widely accepted; in particular, the implications of and evidence of climate change are increasingly apparent. The most prevalent ‘Greenhouse Gas’, Carbon Dioxide, is widely accepted as being a key contributor to climate change.

1.07 Furthermore the UK is set to become a net importer of energy within a matter of years, it is predicted that this will lead to an increase in fuel prices and potentially issues surrounding the security of fuel supplies. There is therefore an increasing economic case for both saving energy and providing on site renewable energy whilst moving towards a diversified energy portfolio.

1.08 There are also several other good reasons for reducing energy use in developments including:

- saving money - the running costs of buildings can be significantly reduced thereby helping to alleviate fuel poverty and decreasing running costs for businesses.
- improving the internal conditions of a building through natural daylighting and ventilation.
- raising the profile of a development and improving its public image.
- improving the marketability of a development.

Local Policy Context

1.09 Leicester City Council has a long history of promoting energy efficiency. The Leicester Energy Action Plan[22] and Energy Strategy 2[23] details Leicester's commitment to an energy efficient city. The aims of the Plan are to reduce the CO_2 emissions in the city by 50% from 1990 levels by 2025 and to source 20% of the city's energy requirements from renewable energy by 2020. Initiatives within the City include the development of small-scale district heating systems and Combined Heat and Power (CHP) in individual buildings. The Council is also investigating other options for CHP and renewable energy and remains committed to incorporating these technologies wherever appropriate.

1.10 This document supports the wider aims of the City of Leicester Climate Change Strategy[24] by providing practical advice on how energy efficiency measures and renewable energy developments can be incorporated into developments to help reduce greenhouse gas emissions and therefore reduce the impact on climate change. It also supports theme 4 of the Leicester Environment Strategy in helping Leicester become highly efficient in its use of energy.

1.11 Transport is the fastest growth area for energy use in the UK. The Local Transport Plan (2001-2006)[5] for the city aims to encourage and develop walking, cycling and public transport and, where appropriate, to bring about a reduction in travel overall. These measures will help stem the increase in energy consumed by transport. Further to this the draft replacement Local Transport Plan cites a reduction in greenhouse gases as part of an over-arching priority for the plan.

1.12 The City of Leicester Local Plan and Replacement Local Plan support energy efficiency and the use of renewable energy important objectives within the context of land use planning and sustainable development. The Plan also complements the aims of the Local Transport Plan by encouraging development to locate in areas with good access and to provide for pedestrians, cyclists and public transport. These considerations constitute only some of the elements contained in the urban design principles outlined in the Local Plan. It is recognised that in some instances, the benefits of energy efficiency will have to be balanced with other needs such as safety and amenity, for example roof mounted photovoltaic panes may not be suitable in a conservation area. Good preparation can, however, ensure that all aspects of urban design are successfully incorporated into a development.

1.13 This guidance supports some of the main strategic themes of both the Adopted Local Plan and the Deposit Draft version of the Replacement Local Plan, reflecting the principles of sustainable development, which underpin the plan and its policies throughout. In particular, the guidance provides further advice to supplement the following policies:

1.14 Adopted City of Leicester Local Plan:

> EN63 Subject to the other policies and provisions in the Plan the City Council as the Local Planning Authority will encourage planning applications for developments which make full use of energy conservation techniques.

1.15 Second Deposit Replacement Local Plan:

UD08a ENERGY EFFICIENCY

Planning permission will not be given for development proposals which would fail sufficiently to achieve efficiency in the use of energy and incorporate measures suitable to the proposal by:

a) maximising the benefits of solar energy, passive solar gain, natural ventilation and the efficient use of natural light through siting, form, orientation and layout whilst addressing the density requirements of buildings;

b) using landscaping to optimise energy conservation.

BE18. RENEWABLE ENERGY

Planning permission will be granted for the development of renewable energy installations where they do not have an unacceptable effect on the local environment that would outweigh their wider community and/or environmental benefits.

All major developments will be expected to provide an assessment of how they will contribute towards the regional targets for renewable energy. Planning permission will only be granted for major developments that realise their potential for meeting their erergy requirements from renewable sources.

BE18a. COMBINED HEAT AND POWER AND COMMUNITY HEATING

Planning permission will be granted for infrastructure associated with combined heat and power schemes where it does not have an unacceptable effect on the local environment that would outweigh their wider community and/or environmental benefits.

All major developments and developments within the Strategic Regeneration Area will be expected, where feasible, to source their energy requirements from combined heat and power (either through on-site plant or a community heating network). Planning permission will only be granted for those developments that source their energy requirements from combined heat and power or can demonstrate that this is not a feasible option

All new developments within proximity to existing or proposed community heating networks must assess the possibility of sourcing their energy requirements from such networks. Planning permission will only be granted for those developments that propose to meet their energy requirements from the network or can demonstrate that this is not a feasible option.

1.16 The recent Report by a Planning Inspector recommended some changes to the wording of policy UD08 in the published Second Deposit Replacement Local Plan, however the overall principal of the policy remained unchanged. The Inspector recommended no changes to the wording of either BE18 or BE18a.

In line with government and regional guidance and the replacement Local Plan Policies (UD 08a, BE18 and BE18a), developers will be expected to address the national, regional and local targets by incorporating a minimum 10% of energy demand by on site renewable energy provision. This base target level will be raised by 1% increments per year for new developments coming forward in future years (eg from December 2005 the target would be 11 %, 2006 12% and so on).

Given the increasing and diverse array of technologies available, and their practicality in an urban environment, this is considered to be an achievable target in the short term.

However, this should be viewed as a minimum figure and is part of a long term shift towards including renewable energy within new developments – By 2020 the target should increase to at least 20%.

1.17 In pursuing the aims of the above policies the City Council expects new developments to follow the principles of the energy hierarchy. The hierarchy is defined in the following order of priority[4].

Energy Hierarchy

- Reduce the need for energy
- Use energy more efficiently
- Use renewable energy
- Clean and efficient use of fossil fuels for heating and co-generation.

2.0 - Sustainable Energy Use in the Built Environment

Reducing Demand

2.01 A wide range of measures from passive solar design to good insulation can be used to reduce energy demand in new developments. In some instances it is even possible to reduce the energy consumption of a building to zero. The City Council encourages developers to work towards this. The location and layout of the whole development has a significant impact on energy demand both in buildings and through transport use. These factors need to be considered at an early stage of the development.

2.02 The refurbishment and conversion of existing buildings can provide an ideal opportunity to improve energy efficiency. The reuse of buildings has the added benefit of maximising the use of energy embodied in existing resources and can contribute towards the regeneration of areas of the city.

2.03 Advice is available on these issues from various sources including the Building Research Establishment (BRE), Leicester Energy Efficiency Advice Centre and Energy Agency and the City Council (pages 21 - 22 gives contact information).

2.04 This section illustrates how energy saving can be achieved in all types of development through location, site layout, building design, materials and appliances. Best practice examples can also be found in the companion guide to PPS22[20] and at the City Council's Better Buildings website www.leicesterbetterbuildings.org.uk, where there are also links to agencies such as BRE and the Energy Saving Trust.

Location

2.05 The location of a development can have a significant impact on energy consumption due to the implications for:

- Access and Movement;
- Passive Solar Gain; and,
- Microclimate

Consideration will have to be given to the locational policies of the City of Leicester Local Plan when identifying possible sites.

2.06 Access and Movement

The most energy efficient cities are highly dependent upon transportation systems that are well integrated with urban layout. Developments which locate in areas that minimise the need to travel and encourage cycling, walking and public transport use can lead to significant energy savings. Existing centres often provide the optimum location for development as they have good public transport access and encourage combined trips. Mixed use development can also help reduce the amount of energy used by transport. Good access for pedestrians, cyclists and by public transport to facilities that are likely to generate a large number of trips is key to achieving these savings.

2.07 Potential for passive solar gain.

Whilst site selection within the City may be limited, sites on southerly facing slopes will have a greater potential for the capture of passive solar gain in buildings rather than those which are north facing. Solar gain may also be affected by the proximity of tall buildings which lead to overshadowing.

2.08 Microclimate

Sheltered sites at lower altitudes will have less building heat loss than exposed sites. Mitigating measures, such as the creation of shelterbelts and building design, can be taken to reduce heat loss from the building envelope (see section 2.1.3).

More information on this can be found at the Leicester Better Buildings Website – www.leicesterbetterbuildings.org.uk

Site Layout

2.09 Site layout also has important consequences for energy used in buildings and through access and movement. Within the context of good urban design principles:

- Access and Layout;
- Orientation;
- Overshadowing; and
- Microclimate

These should be considered early in the design process to maximise a reduction in energy demand.

2.10 Access and Layout

The initial survey of a site should include consideration of the most energy efficient layout. Site layout can have important implications for saving energy through reducing the need to travel and maximising solar gain. This should include good pedestrian, cycle and public transport links both within and beyond the development area to locations that generate a high number of trips.

2.11 Local topography and landscape features should be considered to allow best use of natural daylight and solar energy across the whole development. Slopes will influence the spacing of buildings for solar access. As previously mentioned, southerly slopes are beneficial allowing greater solar access at smaller separations than a level site. North facing slopes can cause significant overshadowing, which can only be alleviated by larger separations between buildings. Overshadowing will also vary throughout the year as the sun's altitude varies and will be more of an issue with taller buildings.

2.12 The losses caused by overshadowing can often be counterbalanced in higher density development, such as terraced properties or flats, through reduced heat loss from the building envelope, greater thermal massing, increased potential for Combined Heat and Power and other measures described in this

guidance. Higher densities can also have a positive impact on other design issues including the need to create good street enclosure. This can be difficult to achieve at lower densities.

2.13 "Sustainable Settlements – A guide for planners designers and developers"[8] and "Planning for Solar Design"[9] provide useful information on the overall principles.

2.14 Orientation

The orientation of a building has a significant impact on the amount of passive solar gain available. To maximise solar gain buildings should be generally orientated with the longest face within 30 degrees of south. South Easterly orientation is generally preferable to south westerly as this maximises early morning gains and reduces the likelihood of overheating in the afternoons.

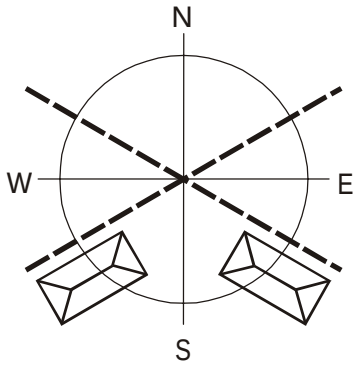
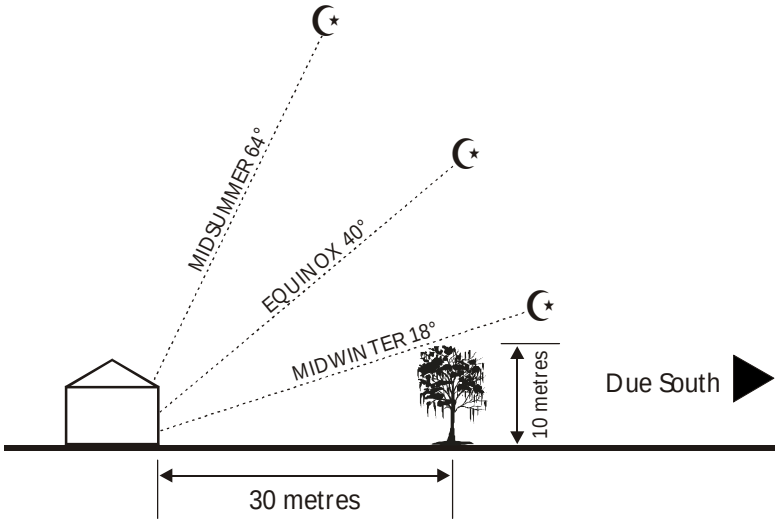


Figure 2: **Building should generally be orientated with the longest face within 30º of south.**

2.16 Overshadowing

Any nearby building, trees or fences can potentially cast shadow on the southerly face and reduce solar gains. Careful layout can still maximise solar gain within the constraints of higher density developments. The following principles should generally be followed:

- Garages should be sited away from southerly elevations.
- In mixed height developments taller properties should generally be sited to the north.
- Higher density properties, i.e. terrace properties should generally be placed north of detached properties, since they cast a greater shadow.
- Care should be taken when planting trees within 30 degrees of the southerly aspect as they can significantly reduce passive solar gain. Deciduous trees can, however, be useful for providing shading from glare and overheating during the summer, whilst the bare branches will allow solar access during the winter.



2.17 *Figure 3: Care should be taken when planting trees or locating buildings within 30° of the southerly aspect as they can significantly reduce solar gain.*

2.18 Microclimate

The local site microclimate can help to shelter buildings from inclement weather and help reduce heat loss from the building envelope. Careful design of the site can help to enhance local microclimate. This is important for comfort in open spaces, which need to be protected from wind, but retain solar access.

- Shelter from cold northerly and prevailing winds can be provided by vegetation. Planting would need to be appropriate to the site and type of development.
- Higher density building, such as terraced housing or taller buildings sited to the north can provide wind protection for housing to the south.
- Avoid long uninterrupted road passages that may channel the wind.
- Buildings can be arranged in an irregular street pattern to avoid channelling the wind. Taller buildings need careful design in relation to the rest of the site to avoid channelling wind and creating unpredicted areas of high wind speeds.

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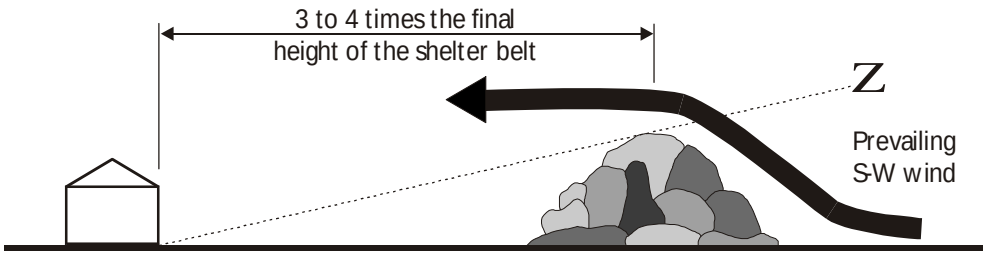


Figure 4: Appropriate planting can provide shelter from Northerly or prevailing winds

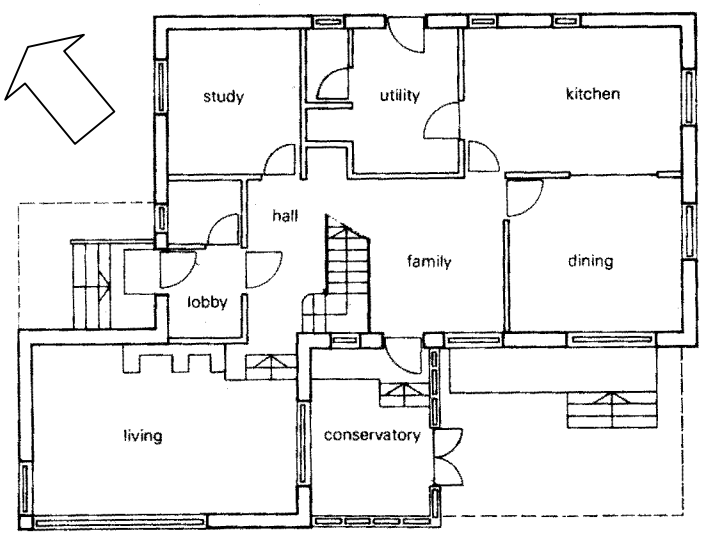
Building Design

2.19 The energy efficiency of a building can be influenced by how the space within a building is used, insulation and materials used[7,8,13]. Part L of the Building Regulations require a minimum standard of energy efficiency in new developments. The Council, however, strongly encourages developers to strive to achieve standards beyond these minimum levels, so that the significant benefits of reducing energy consumption are maximised. Several methods of rating the energy efficiency of individual buildings are now available. Most domestic properties are given an energy rating such as a Standard Assessment Procedure (SAP) or National Home Energy Rating (NHER). The City Council will seek all new residential development to achieve an NHER of at least 10. The Building Research Establishment (BRE) have also introduced an "Ecohomes" environmental rating for homes[10]. Non-domestic buildings can be assessed through BREEAM (Building Research Establishment Environmental Assessment Method). This provides guidance on ways of minimising the adverse effects of buildings on the environment, both locally and globally.

2.20 Sources of further information on the above assessments are given on page 21 - 22. Leicester City Council strongly encourages the use of the BREEAM and Ecohomes ratings, particularly for larger developments. There is currently a free Design Service offered under the DEFRA Energy Efficiency Best Practice Programme for developments or refurbishments with a floorspace over 500m^2.

2.21 Passive Solar Design

The use of space and glazed areas within a building can improve energy efficiency. Passive Solar Design (PSD) allows better daylighting, improves solar gains and provides natural ventilation reducing the need for costly mechanical ventilation. The following principles should be followed to reduce energy requirements.



2.22 *Figure 5: Ground floor plan, Lifestyle 2000, Milton Keynes.*
(Architects: TRADA, Geoff Pitts, Project Architect. Reproduced with kind permission of The Architectural Association from 'Solar Energy and Housing Design Volume 1: Principles, Objectives, Guidelines, published by Architectural Association Publications, 1994).

- The main rooms, with maximum occupancy should be on the south side of the building to make best use of solar gain. The north side of the building should be taken up with rooms with lower occupancy such as toilets, cloakrooms and storage space that require less heating. These considerations must, however, be balanced with the need for good surveillance of public areas.
- Kitchens can be situated on north facing facades as overheating is less likely. This is also true of rooms containing machinery that generates heat.
- Glazed sunspaces such as conservatories can be used to regulate the heat of the rest of the house. These spaces must be thermally isolated and unheated otherwise increased energy use occurs.
- The use of buffer zones and draught corridors such as porches, stairwells and adjoining buildings can significantly reduce heat loss if those areas are not heated themselves.
- A larger ratio of glazed areas can be considered for the south-facing facade to enable a higher contribution of solar radiation for space heating. However excessive glazing can lead to summer overheating and net heat loss in winter and should be avoided. Consideration must also be given to the need for good surveillance from glazed areas of the public domain.
- The mass of a building will affect its ability to store heat through thermal massing. Heavier weight, masonry structures are generally more resilient to temperature changes.

  The Building Research Establishment and the DEFRA can advise on all aspects of PSD and building design[8, 13, 17].

2.23 Insulation

To maximise energy efficiency the heat losses from the building envelope must be kept to a minimum. This is achieved by applying high levels of insulation to the roof, walls and floors. Insulation can also be improved through the joining of units to increase thermal massing and reduce heat loss through exposed walls, Heat loss from windows can be further reduced by specifying argon gas-filled glazing or triple glazing. However adequate ventilation without draughts is essential to avoid condensation problems. Air handling units with heat recovery and active solar supplies can be considered.

The rebuilt 'Boot Houses' on the Saffron Estate have achieved an NHER rating of over 10 through good insulation and use of energy efficient appliances

2.24 The conversion and refurbishment of properties provides an ideal opportunity to improve the energy efficiency of a building. Insulating material can be applied or increased in the roof and internally on the walls; reglazing also allows energy savings to be made. When considering the reglazing of historic buildings account must be taken of their special characteristics. The use of UPVC (plastic) units is not appropriate in such instances. English Heritage can provide advice on the use of effective alternatives to UPVC. (Further information on insulation is available from the Energy Saving Trust, BRE or Leicester Energy Efficiency and Advice Centre and Energy Agency; see details on page 21 -22).

2.25 Materials

The materials used in the construction and refurbishment of property affect the embodied energy of a building. In general, materials with low embodied energy need to be used. The embodied energy of a building can be reduced by using:

- Local supplies to reduce the energy used by transport.
- Materials that require low energy for manufacture.
- Recycled materials.
- Renewable materials such as timber

2.26 There are a number of tools available for performing life cycle analyses and further information is available from the BRE[10,14]. Information and advice on a range of other tools such as BREEAM and Ecohomes certification, which can be used to improve the energy efficiency of buildings is provided by the BRE[10]. The DEFRA is also a good source of information on sustainable construction[16].

The Queens Building on the DeMontfort University campus makes optimal use of natural daylight and natural ventilation to reduce energy requirements

Using Energy Efficiently

2.27 Once the demand for energy has been reduced further savings can be made through the use of energy efficient appliances and the behaviour of people using the buildings. High rated energy efficient appliances can be specified as part of the original fit. Design choices will affect the way that people use a building.

Appliances

2.28 Appliances provide heat, lighting and other essential services and are major consumers of energy. The careful choice of appliances can reduce energy demand and therefore costs significantly. Domestic property should as far as possible use the most energy efficient appliances within the required price range, in particular, energy and water efficient white goods.

2.29 The European Union energy label classifies the energy rating of goods from A (most efficient) to G (most inefficient). The Energy Saving Trust 'Energy Efficiency Recommended' Scheme highlights A and B appliances as energy efficient. Leicester Energy Efficiency and Advice Centre and Energy Agency can provide advice on the above. The Ecohouse run by Environ demonstrates many examples of good practice (contact information p.21 -22).

The Ecohouse on Western Park demonstrates many examples of good practice relating to energy efficiency and use of renewable energy.

2.30 In non-domestic buildings the opportunities for energy efficiency can be even greater. For example:

- Energy efficient lights can save money in both running costs and maintenance.
- Energy efficient boilers for heating and hot water demands can also reduce costs.
- In larger buildings a Building Energy Management System (BEMS) can be useful.
- Ventilation can be provided naturally or if this is not possible an energy efficient ventilation system can be used.
- Metering can provide important monitoring data and allow for targets to be set and adjusted in response to adverse performance

2.31 Leicester Energy Efficiency and Advice Centre is able to offer advice to all businesses in the city on their energy usage. The DEFRA "Best Practise Programme" provides information on efficient energy usage in all types of building and industry. Guides are available from the BRE.

Encourage Energy Efficient Behaviour

2.32 Significant savings on energy expenditure can be made through changing individuals behaviour. Encouraging people to be responsible for energy efficiency and the use of energy is an effective way of improving energy savings. At places of work this may be achieved through individual initiatives or as part of a more formal environmental auditing system such as EMAS or ISO 14001. Staff travel plans can also be developed to encourage more energy efficient means of transport to and from work. The Leicester Energy Efficiency Advice Centre and Energy Agency can provide staff training for businesses as well as providing free and impartial advice on all aspects of energy use in homes.

The Energy Efficiency Advice Centre and Energy Agency on Market Place South

3.0 Renewable Energy

3.01 Regional Spatial Strategy 8 for the East Midlands (March 2005) sets out the following renewable energy targets for Leicestershire to be achieved by 2010:

Renewable Energy Technology	Capacity (MW)	Electricity (GWh/y)
Onshore Wind	22.0	58.0
Biomass – Wet Agricultural Waste	1.2	9.3
Biomass – Energy Crops	10.0	75.0
Solar – Photovoltaics	0.4	0.34
Landfill Gas	18.0	150.0
Anaerobic Digestion	3.4	26.9
TOTAL	**55.0**	**319.54**

3.02 Major developments, defined as those of either 10 or more residential units or non-residential units greater than 1000square metres of floorspace, are expected to provide an assessment of how they will contribute to these regional targets for renewable energy, through on-site renewable energy provision.

3.03 The opportunity for developments to contribute will vary, as the potential for integrating renewable energy projects will differ greatly between different developments and different sites. Renewable energy installations are likely to be affected by the physical nature of the development such as aspect, building height and the amount of on-site open space.

3.04 There is a great potential for using renewable energy in urban areas such as Leicester through the incorporation of passive solar design and active solar technologies into developments. The planning implications of the main types of renewable energy relevant to the City are discussed in Appendix 1 and Table 2 summarises the key technological and planning requirements. Major developments within the City will be encouraged to carry out an assessment of the contribution renewable energy technologies can make in meeting the energy requirements of the proposal. The Leicester Energy Efficiency and Advice Centre and Energy Agency can provide support and guidance on carrying out an assessment.

3.05 A further advise booklet detailing how to undertake a Renewable Energy Assessment will also be available – for further information on this, contact the Leicester Better Buildings Project Manager

3.06 In accordance with guidance in PPS22, renewable energy developments within conservation areas and areas with special historic designation should only be granted planning permission where it can be demonstrated the objectives of the area will not be compromised; or the development will provide environmental, social and economic benefits that clearly outweigh this.

3.07 Renewable energy technologies that have the potential to be exploited in the city include:

- Solar Water Heating

  Solar Water Heating can offset a large part of the hot water requirements for a building. Such systems:

  - perform best in the summer when other heating needs are at a minimum, avoiding the need to run boilers at low loads when they are less efficient.
  - can be easily installed.
  - need to be operated in conjunction with a traditional water heating method
  - can often be incorporated where roofing work is taking place thereby reducing costs.
  - are particularly suited to swimming pools, leisure centres and large water users.

3.08 • Photovoltaic Cells

Photovoltaic (PV) cells generate electricity from the sun and can be incorporated on most buildings as tiling or cladding. Whilst the technology is quite expensive (although prices are falling) they can be used to raise the profile of more prestigious commercial buildings or pioneering residential developments. The cost of photovoltaic cladding can offset the cost of other building cladding materials. They are also effectively maintenance free throughout their life expectancy. However, at present solar water heaters are said to be six times more efficient than solar panels. Also, micro turbines are six times more efficient in terms of energy generation than solar photovoltaics and energy generated from micro wind has a radically lower manufacturing embedded energy cost.

3.09 • Heat Pump Technologies:

Heat pump technology works on the same principal as refrigeration units, by generating heating or cooling through exploiting naturally occurring heat differentials rather than using electricity to generate new heat.

Ground Source Heat Pumps (GSHP)

These use the natural heat in soil to provide heating and cooling to buildings. The temperature just a couple of metres down into the earth's crust is roughly constant all year at around 12°C in the UK. The difference between this constant temperature and the fluctuating air temperature can be harnessed through a network of underground pipes.

Water is pumped through the pipes absorbing the ground heat, which can then be used to provide relatively cheap heating for buildings in the winter months and cooling in the summer months.

The technology is best suited to developments with large open spaces such as carparks or playgrounds, but can also be integral to the building floorplate. It works best with underfloor heating systems in maximising the heating and cooling effect. It is difficult to retro-fit, and is really only viable when incorporated into new buildings during construction.

3.10 Air Source Heat Pumps (ASHP)

These are similar in operation to the more prevalent GSHP but they omit the need for a buried heat collection system, deriving their heat (or cooling) from the ambient air or, as is often the case, from the exhaust air in a controlled ventilation system.

ASHP deriving their heat from exhaust air will generally produce higher efficiencies than those taking heat from ambient air. This is because the heat pump needs to do less work to upgrade the temperature. Hybrid systems will produce resultant efficiencies between the two.

The efficiency is determined by the co-efficient of performance (COP) - simply put, the ratio between the electrical energy input and the heat output as measured in kilowatt hours. A COP of between approaching 3 and up to 5 will be generally achievable, which means an output of between 3 and 5 kWh of heat for each input kWh of electricity.

3.11 • Small Scale Wind Turbines

Industrial and leisure sites with some open space can be suitable for small-scale deployment of wind turbines; land in other uses may also be suitable. A new generation of small scale, building mounted wind turbine is now available. The absence of stress vibration problems increases the opportunities for development. With recent and potentially further technological improvements in the noise and other impacts of larger turbines there may also be a case for larger turbines in urban areas.

3.12 • Energy from Waste

Some industrial developments may produce sufficient waste for on-site energy from waste and CHP to be considered. Certain processes produce large amounts of organic waste and waste can be removed from the municipal or industrial waste stream to operate either aerobic or anaerobic digesters. Biogas produced by either process can be used in a CHP plant, generating heat and electricity and saving fossil fuels in both cases.

Biomass may be appropriate for both the domestic and non-domestic sectors and can meet Clean Air controls.

3.13 • Biomass

Biomass boilers, which burn the chipped or pelleted products of forestry operations or short rotation coppice (fast-growing willow or poplar crops harvested on a three year cycle), offer the potential for space heating and hot water production from a renewable, non-fossil fuel source that is carbon dioxide neutral in operation. New growth absorbs the CO2 that is emitted in the combustion process so there is no net increase in carbon products released to the atmosphere.

Simple manually fed domestic stoves perform in the same way but there is a scale of boilers to suit any development, whatever its size. Pellets are also more sustainably transported than wood chips. Either woodchip or pellet forms can be automated and require no day-to-day attention. The combustion residue is small, with pellets particularly, creating virtually no ash. Maintenance is of a routine and low level nature. The technology is also tried and tested, having been used in Scandinavian countries and North America, for decades. Applications in the East Midlands are growing, with biomass boilers operational in several schools.

4.0 Combined Heat and Power & Community Heating

4.01 The Regional Spatial Strategy 8 for the East Midlands (March 2005) sets out regional CHP targets in policy 40 as follows:

Year	Regional Target
2010	511 MWe
2020	1120 MWe

4.02 The Second Deposit Replacement Local Plan contains a specific policy on Combined Heat and Power and Community Heating:

Combined Heat and Power plant (CHP) provide both the electricity and heat to a site. They can reach 85% efficiencies in comparison to 30% from traditional electricity generation where the heat is wasted. Latest Government policy is encouraging the use of CHP and funding may be available for innovative projects through the Climate Change Levy. CHP schemes generally run on gas or diesel fuel although biofuels can be used. The reuse of heat is a key element in the cost effectiveness of a scheme and if heat is not required CHP loses much of its appeal.

4.03 CHP technology is well proven and plant size is reducing making it more viable for a range of schemes. District Heating networks offer a potential heat market and heat can be sold to neighbouring buildings or developments thereby earning income for the building operator. Opportunities for CHP can be exploited in:

4.04 • Mixed Use Developments

Mixed-use developments offer good opportunities for CHP. Heat from industrial or commercial sites could be used in a district heating system whilst small groups of community buildings including shops, offices, halls and swimming pools can exploit small scale CHP. Leicester City Council would welcome the provision of district heating infrastructure in new and refurbished developments.

4.05 • Large Buildings

CHP units are well suited to large buildings, such as offices and shopping precincts and factories; the Glenfield Hospital is a good working example.

4.06 • Hospitals and Leisure Centres

Hospitals and leisure facilities including swimming pools are well suited to CHP as heat is required throughout the year.

4.07 • Refurbished Buildings

CHP schemes may be suitable in refurbished buildings where the heat produced can be sold or sent to neighbouring buildings to reduce their heating demand. Refurbished buildings could also draw on heat from neighbouring CHP schemes.

4.08 • City Centre Developments

City centre developments may particularly lend themselves to sharing heat and or electricity as the costs of infrastructure will be lower.

4.09 • Energy from Waste Plants

Biogas produced from waste plants can be used for CHP.

Micro CHP

4.10 Micro CHP is an emerging technology, which enables the benefits of combined heat and power to be made available on a much smaller, domestic scale than traditional CHP plants

It involves the replacement of a traditional boiler with a gas fired micro CHP generator, which can provide a house with all its heating needs, and significant proportion of its electricity needs.The house will remain connected to the National Electricity Grid, to supplement electricity not provided by the CHP unit, while surplus electricity generated can be sold back to the grid.

The CHP boiler unit is similar in size to a standard washing machine, and can be installed in most houses.

Micro CHP can work at up to 90% efficiency, helping to reduce energy costs to the consumer and reduce carbon emissions.

4.11 The Leicester Energy Efficiency Advice Centre and Energy Agency can provide further Guidance on Combined Heat and Power and District Heating Schemes. Information is also provided through the Government's Energy Efficiency Best Practice Programme (see pages 21 -22).

4.12 A further advice booklet detailing how to undertake a Combined Heat and Power Assessment will also be available – for further information on this, contact the Leicester Better Buildings Project Manager

MICRO-GENERATION

4.13 Micro-generation is the production of heat and/or electricity on a small-scale from a low carbon source. It includes the generation of energy by householders installing micro-units in their own homes. Various technologies can be used for micro-generation - air source heat pumps, ground source heat pumps, fuel cells, micro-CHP, micro-hydro, micro-wind, bio-energy and solar (thermal and PV(photovoltaic).

4.14 Not all of these technologies are necessarily renewable or wholly renewable in their energy production. Micro-CHP, for example, may be connected to a network (fossil fuel) gas supply, and heat pumps require a priming electricity input, which may often be sourced from the national grid and have a fossil fuel origin. These are all decisions over which specifiers can exercise some control.

4.15 The principal benefits of micro-generation are decentralised, generally more efficient production that has the capability of;

- Reducing carbon emissions by providing low carbon sources of electricity and heat to homes and small commercial premises
- Ensuring reliable energy supplies - reducing the load on the distribution network and transmission losses and could avoid over-dependence on energy imports.
- Promoting competitive markets – micro-generation introduces an additional aspect to the energy markets giving people a wider choice of products from which to gain their electricity and heat.
- Affordable heating for all – micro-generation is currently a more costly contributor to reducing fuel poverty than energy efficiency measures but if upfront costs can be defrayed, the lower energy bills associated with such technologies could potentially contribute to

reducing fuel poverty.

5.0 Tables

5.1 Table 1: Opportunities for Energy Conservation and Renewables for New Developments in Leicester

Energy Hierarchy	Domestic	Non-domestic
1. Reduce Demand	• Located to minimise car journeys • Well designed layout • Passive solar design • Life cycle analysis of materials • High levels of insulation • High NHER (10 or above)	• Located to minimise car journeys • Well designed layout • Passive solar design • Life cycle analysis of materials • Natural ventilation • High levels of insulation • BREEAM
2. Energy Efficiency	• Condensing boilers • Energy efficient white goods and lighting • Good heating controls • Influence behaviour	• Building Energy Management Systems • Energy efficient appliances and equipment • Condensing boilers • Energy efficient/ natural ventilation • Influence behaviour
3. Renewable Energy	• Passive solar design • Solar water/air heating • Photovoltaics • District heating • Small scale vertical axiswind turbines • Ground Source Heat pumps	• Passive solar design • Photovoltaics • Solar water/air heating • Energy from waste • Small scale hydro • Small scale wind • Ground Source Heat pumps
4. CHP/District Heating	• District heating and CHP	• CHP with waste digestion • CHP feeding district heating

Any renewable technologies requiring planning permission will be considered against the policies of the Adopted and emerging Replacement City of Leicester Local Plans and other material planning matters. The above table indicates key planning considerations that are most likely to affect each type of technology.

5.2 Table 2: Key Technology Requirements and Planning Considerations for Renewable Energy in Leicester

Renewable Energy Technology	Main Technology Requirements	Key Planning Considerations
Passive Solar Design	• Good solar access • Design choice factors	• Urban Design Policies • Relevant SPG
Solar Heating	• Near South-facing roof based collector with no shading	• Amenity (visual impact) • Conservation issues
Photovoltaic	• Near South-facing roof or wall mounted collectors with no shading	• Amenity (visual impact) • Conservation issues
Energy From Waste	• Steady waste supply • Storage for waste for a number of days • Proximity to grid	• Waste Local Plan • Amenity (including noise, emissions, safety) • Traffic movements • Relevant SPG
Landfill Gas	• Methane gas from waste site • Proximity to electricity grid	• Waste Local Plan • Amenity (including noise, emissions, safety) • Relevant SPG
Small Scale Wind	• Turbines require reasonably exposed, open site away from buildings • Close to point of use	• Amenity (including noise, safety, visual effect) • Electromagnetic Interference • Relevant SPG
Biomass	• Steady supply of Biomass • Proximity of fuel source to biomass plant • Storage	• Waste Local Plan • Amenity • Traffic movements
Ground Source Heat	• Large amount of undisturbed flat space or land suitability assessment required for potential vertical bores • Difficult to retro fit, most suitable for new builds • Close to point of use	• None as majority of technology is located beneath the ground
Air Source Heat	• Close to point of use	• Amenity (including noise, safety, visual effect)

6.0 Further Information and Advice

- Leicester City Council Environment and Development Department, New Walk Centre, Welford Place, Leicester LE1 6ZG. Relevant services include:

  - Development Control Group - for planning related issues: tel: (0116) 252 7249

  - Urban Design Group - for design related issues: tel: (0116) 252 7294

  - Pollution Control Group - for environmental health issues: tel: (0116) 252 6339

  - Leicester Better Buildings Project Manager: tel (0116) 252 7216

  - Website: www.leicester.gov.uk

  - Better Buildings Website: www.leicesterbetterbuildings.org.uk

- Leicester Energy Efficiency Advice Centre and Energy Agency, 2 Market Place South, Leicester Tel: 0116 2995147. Provide comprehensive and up to date technical advice and training on energy efficiency and renewable energy.

- Environ, Parkfield, Western Park, Leicester LE3 6HX Tel: 0116 222 0222

  Environmental organisation with energy expertise. Examples of good practice are included in the Ecohouse next door to their offices.

  Website: www.environ.org.uk

- Institute of Energy and Sustainable Development, De Montfort University, Queens Building, Mill Lane, Leicester. LE1 9BH. Tel: 0116 257 7964. www.iesd.dmu.ac.uk

- Building Research Establishment (BRE) Garston, Watford WD2 7JR. Tel: 01923 664258. Useful BRE related websites include:

  www.bre.co.uk for homepage.

  www.bre.co.uk/sustainable includes information on BREEAM and Ecohomes.

  www.energy-efficiency.gov.uk for information on DEFRA Best Practice Programme including the publications, information on the free design service (available to developments and refurbishments with a floorspace over 500m^2) and information on CHP.

  Direct telephone advice on all energy efficiency measures is also available to UK organisations from the Environment and Energy Hotline: 0800 585794

- National Home Energy RatingThe National Energy Centre, Davy Avenue, Milton Keynes, MK5 8NA Helpline: 0908 672787.

- Energy Technology Support Unit (ETSU) Harwell, Oxfordshire OX11 0RA. Tel: 01235 436747

  Provide advice on energy efficiency and sustainable energy technologies. Further information is available on their website: www.etsu.com

- Energy Saving Trust 21 Dartmouth Street London SW1H 9BP Tel: 020 7222 0101

Website – www.est.org.uk

Provides advice on energy saving measures and small scale renewable energy technologies

- DEFRA Sustainable Construction Team Zone 3/J1, Eland House, Bressenden Place, London SW1E 5DU.

  Website: www.construction.detr.gov.uk/sustain/index.htm

  Provides advice on energy saving measures and small scale renewable energy technologies

- Policy Documents – Online copies of relevant policy documents

  Energy White Paper (2003) - www.dti.gov.uk/energy/whitepaper

  Regional Spatial Strategy for the East Midlands – RSS 8 (2005) - www.goem.gov.uk/goem/psc/suscom/rss

  Leicestershire, Leicester and Rutland Structure Plan (1996 –2016) - www.leics.gov.uk/adopted_strucutre_plan.doc

  Leicestershire, Leicester and Rutland Waste Local Plan (1995 – 2006) –

  www.leics.gov.uk/waste_local_plan_intro

  Planning Policy Statement 1: Delivering Sustainable Development (2005) - www.odpm.gov.uk/stellent/groups/odpm_control/documents/contentservertemplate/odpm_index.hcst?n=5845&l=3

  Planning Policy Statement 22 Renewable Energy (2004) and Companion Guide (2004) - www.odpm.gov.uk/stellent/groups/odpm_control/documents/contentservertemplate/odpm_index.hcst?n=5681&l=3

  Adopted City of Leicester Local Plan (1994) - www.leicester.gov.uk/index.asp?pgid=1203

  Replacement City of Leicester Local Plan (2005) - www.leicester.gov.uk/index.asp?pgid=951

7.0 Appendix 1: Renewable Energy

Solar Energy

7.01 Solar Energy is well suited to providing heat and power in an urban setting. There are three ways of using solar energy:

- Passive solar design
- Active solar heating
- Solar electricity

7.02 Passive solar design makes best use of the sun's rays to defer the need for heating and lighting within a building. As such it can allow large energy savings, and is thus commonly regarded as an energy efficiency measure. Active Solar Heating provides hot water or warms up air for heating but not electrical power. Again this can offset the need for heating from conventional boilers or electrical heaters, and lead to a saving of CO2. Solar electricity can be used to power household appliances or to feed into the electricity grid, as well as providing space and water heating.

7.03 Passive Solar Design

Allowing as much of the sun's energy to naturally heat and light rooms is the essence of passive solar design. In general, there is no additional cost associated with the building, but the design must be incorporated from the beginning, as retrofitting is not generally an option.

7.04 Active Solar Heating

Active solar heating systems consist of solar collectors, commonly sited on roofs. The solar energy is used to heat water or air, which is then used within the building. Active solar systems are commonly employed alongside a conventional, energy efficient, heating system, and therefore reduce the amount of heat from conventional sources. In general, most summer hot water requirements could be met by solar power.

7.05 There are a number of commercially available solar heating systems, of varying efficiencies and cost. The systems can be easily incorporated in new buildings or retrofitted on older buildings. For the systems to work efficiently they need good exposure to maximum hours of sunlight. South facing roofs are generally the best location. In the urban environment there is the possibility of overshadowing form adjacent tall buildings that can seriously reduce the efficiency of a system. Site surveys to check on orientation and the possibility of overshadowing would be advised if fitting active solar water heating systems.

7.06 The potential for active solar apparatus in Conservation Areas and on Listed Buildings or buildings subject to "Article 4" controls will be restricted and Conservation Area Consent or Listed Building Consent would also be required.

7.07 Solar Electricity

Solar electricity is generated using photovoltaic (PV) cells made from semiconductor material. The sun's heat is converted directly to electricity. PVs are now available commercially and have been employed in a variety of building projects. Costs are still comparatively high and full market penetration is not likely for several years. However, costs can be offset against the cost of other building cladding making photovoltaics the cheaper option.

7.08 PVs can be mounted almost anywhere on a building. They can be used as alternatives to wall cladding or roof materials or they can be mounted as arrays on flat roofs. Orientation is important, with the best results achieved when the angle of the PV cells matches the angle of the sun. This is not always practicable as it involves altering the pitch of the cells throughout the year. In practice most arrays are fixed at an angle which is best suited to the buildings electricity requirements and geographic location. For example, optimum generation in summer to meet a building's cooling requirement, through air conditioning.

7.09 PVs are well suited for use in large offices and public buildings, as the energy supply is at maximum during the period of maximum building occupation. They are particularly useful in buildings that require air conditioning as maximum power coincides with maximum demand. In general the electricity requirements for domestic properties are not well matched by the power from PVs, as most domestic dwellings have maximum demand between about 6pm and 10pm when the sun is low in the sky or has set. However a grid-linked system can export electricity during the low demand period and import electricity in the evening.

7.10 The positioning of PVs needs careful attention as overshadowing can reduce the efficiency of the cells markedly. The cells need to be in full sun throughout the daylight hours in order to function best. This requires particular attention in heavily built up areas where buildings can overshadow each other for large parts of the day. Careful site surveys are advised and a visual impact assessed.

Small Scale Wind Power

7.14 Leicester is not an area of high wind speeds and its urban nature means that the city has not been associated with large-scale wind power. Wind turbines that are tailored to the local wind regime can, however, generate electricity effectively, as long as there are not too many totally calm days. The wind is not a constant source of power, which means that back up systems are needed which would usually be the National electricity grid. The power from the wind can also be converted into heat for use as a heat store.

7.15 With the exception of the emerging generation of micro building-mounted wind generators, wind turbines need to be sited away from buildings, both for safety reasons and to ensure that the airflow to the turbine is as undisturbed as possible. Generally turbines need to be sited around 10 times the height of the tower away from the nearest building. The generating equipment is usually located within the tower and so public access is possible right up to the tower. Other considerations include noise and electromagnetic interference although these should not be too problematic in small scale developments.

7.16 Wind power applications are possible on more open sites such as industrial complexes or leisure facilities. The views of the local community and planning authority should be sought at an early stage.

Small-Scale Hydro Power

7.17 The rivers in Leicester flow over gently inclined land limiting applications for hydro-power. There are faster flowing sections of watercourses which may be appropriate for the development of small-scale hydro-power. Any development would need to be carefully balanced against the needs of other river uses, including leisure, fishing and water supply, as well as the impact on the local natural habitats and amenity.

Biomass

7.18 Biomass can be in the form of crop residue, coppiced wood or animal waste. Biomass can also be used to produce liquid fuels, which may be substituted for oil. Many of these applications are more suited to rural and agricultural areas. There may be limited possibilities for energy crop production on the fringes of the city or within the Green Wedges.

7.19 Willow and poplar coppice can also improve biodiversity by providing natural habitats for animals and birds. For the best effect the wood should be used as close as possible to the source, as the energy used in transferring the wood to a distant site soon equals the energy achieved from the wood. Use of Combined Heat and Power technology with liquid fuel or gassified biomass rather than oil or natural gas could also be practical for areas close to the city's Green Wedges with heat from the CHP providing district heating to nearby housing or offices.

Heat Pump Technologies

7.20 Ground-source heat works by extracting heat from the low-temperature heat (10–20°C) that is found at relatively shallow depths within the earth's crust. The ground is naturally heated by the sun and remains at a relatively constant temperature all year; heat can be taken from the ground itself or from groundwater. Heat pumps can increase the temperature to provide a more useful output temperature of around 40–50°C, ideal for low-temperature heating systems like under floor systems and radiant panels. Heat Pumps do need some power to operate however for 1 unit of energy they use, they generate 3 units of heat.

7.21 The energy generated by a ground source heat pump can be considered 100% renewable if the power to operate the pump comes from a renewable source such as solar electric panels or a wind turbine. Ground source heat is relatively cheap to provide, the costs involved are those of the installation and the maintenance of the heat pump. Ground source heat developments are best suited to developments that have plenty of open space under which to lay the horizontal pipework; pipes can also be laid in vertical shafts, however this is more costly. They are best suited to developments that require constant – year long heating and/ or cooling such as housing or sports centres and less suited to developments with large periods of infrequent use such as schools or community centres.

7.22 Ground source heat requires little maintenance for the actual piping, as there are no moving parts. The pumps that circulate the water around the system are located above ground, and are therefore relatively accessible for maintenance purposes.

7.23 Whilst not as efficient as ground source heat pumps, air source heat pumps have a number of practical and cost advantages in terms of lower capital costs and no need for ground loops They can be more easily retro-fitted into existing buildings and can satisfactorily replace conventional boilers, they can work in temperatures as low as -18°c however below 4° performance is not optimal traditional heating methods may have to be used. Many AHSP units come with this facility included.

Energy from Waste

7.11 The City Council actively pursues waste reduction and recycling, the new Biffa Recycling Centre at Bursom, has recently reached a recycling and recovery rate of 28 per cent, and is on target to reach a 40 per cent recycling rate during 2005. some municipal solid waste (MSW) is still taken to landfill sites. The increased cost of landfill with the new landfill taxes and the cost of transporting waste to sites at some distance from the city make the provision of energy from waste within the city an attractive option.

7.12 Energy from MSW can be achieved through aerobic or anaerobic digestion or incineration. The incineration of waste within the City is not, however, a favoured option. Modern plants are designed to both generate electricity and provide heating, as a Combined Heat and Power (CHP) plant. Even with extremely successful recycling schemes the amount of MSW is still large and is likely to remain substantial even if the Governments recycling targets are met. The digestion of MSW will significantly reduce the amount of material to be disposed of in landfill and ensure that harmful greenhouse gases such as methane do not escape into the atmosphere. Many other harmful chemicals can be separated out eliminating leaching from landfill sites into groundwater supplies. Waste heat can be channelled into district heating schemes thus reducing the need for local heating. CHP is also a possibility where waste is disposed of on site such as hospitals.

7.13 Energy from waste plants have to meet strict pollution standards, although there are often public concerns on the levels of harmful substances in potential exhaust gases. Any new plant should be sited sensitively in relation to the local community and every effort should be made to involve the local community throughout the planning process, to increase the public confidence in the scheme. Discussions should also be undertaken early on in the site selection process with the Development Control section at the Council. Any major schemes would have to carry out an Environmental Impact Analysis to be submitted with the planning application.

7.24 *Further guidance is also available in Planning Policy Statement 22 on Planning and Renewable Energy and the companion guide (2004). Most renewable installations would require planning permission and early dialogue with the City Council is advised. Some technologies may also require an Environmental Impact Assessment and are subject to other legislation such as the Environment Act 1990. The City Council can also provide advice on these issues (see contacts pp.21 - 22).*

8.0 Appendix 2: Policy Context

International

8.01 The prospect of global climate change, due to the heating of the earth's atmosphere by greenhouse gasses is probably the most convincing reason for pursuing sustainable development. The need to take action to curb greenhouse gas emissions has been recognised by international commitments made at the Rio De Janeiro Earth Summit of 1992 and the subsequent Kyoto conference in 1997. The Kyoto Protocol set legally binding emission reduction targets for developed countries, with the UK, as part of the EU, accepting a 12.5% target below 1990 levels by the period 2008-2012. However the UK government has set itself an even tighter target of 20% reductions.

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

National

8.03 The 2003 Energy White Paper[21] sets out the UK Governments current and future energy policy; by 2050 it is aiming to produce a 60% reduction in CO2 emissions. The aim is to move towards a sustainable energy policy, increasing the proportion of energy produced from renewable sources and reducing the UK's dependence on imported, high carbon emitting fossil fuels, in a shift towards a low carbon economy. The government wants to increase the total percentage of energy produced from renewable sources to 10% by 2010 and 20% by 2020 (levels are currently around 3%) it emphasises that this needs to be a continual process

8.04 Planning Policy Statement 1 (PPS1) Delivering sustainable Development (2005) states that high quality design should be sought that will last for the lifetime of developments. This requires the carefully planned, high quality buildings and spaces that support the efficient use of resources. It also states good design should consider the direct and indirect impact on the natural environment.

8.05 Planning Policy Statement 22 (PPS 22) Renewable Energy (2004) follows the Government's Energy White Paper The PPS sets out guidelines for Local Authorities to follow when considering Renewable Energy (RE) developments. It represents a significant strengthening of policy and signals the government's commitment to facilitating RE developments.

8.06 Throughout the 1990s it has been the UK Government policy to stimulate the use of renewable resources wherever it is economic and environmentally acceptable to do so. The target of 1500 MW of generation by 2000 originally set by the 'Prospects for Coal' White Paper of 1993, was increased by the incoming Government of 1997. The New and Renewable Energy Review confirmed this domestic target of 10% of electricity generated from renewables by 2010, as feasible.

8.07 To date the main instrument for securing electricity capacity from renewables has been the Non-Fossil Fuel Obligation (NFFO). In the UK since 1990 its subsidy has enabled some 650MW to be commissioned; in this way technologies approaching viability such as landfill gas, small hydro, energy from waste and windpower schemes have gained entry to the electricity market. The National situation is now progressing rapidly. The Utilities Bill places an obligation on all electricity suppliers to purchase

10% renewable electricity, this will supersede the NFFO arrangements. The introduction of the Climate Change Levy and possible carbon trading are also encouraging energy efficiency in business.

Regional

8.08 The Regional Spatial Strategy for the East Midlands (RSS 8) recognises the need to improve energy efficiency and increase the amount of renewable energy in the region.

Policy 40 gives regional priorities for energy reduction and efficiency:

Local authorities should promote the reduction of energy usage in line with the energy hierarchy and the development of Combined Heat and Power (CHP) and district heating infrastructure necessary to achieve the regional target of 511 MWe by 2010 and 1120 MWe by 2020.

Local Development Frameworks should:

- Include policies and proposals to secure a reduction in the need for energy through the location of development, site layout and building design; and
- Identify sites suitable for CHP plants well related to existing or proposed development and encourage their provision in large scale schemes.

8.09 At present the Regional renewable energy production is at 1.6% of the total power produced in the region

The Regional Energy strategy sets:

Policy 41

Development frameworks should include policies to promote and encourage the delivery of the renewable energy targets set out.

Policies should be supportive of renewable energy proposals in locations where environmental, economic and social impacts can be addressed satisfactorily.

In establishing criteria for new facilities required for renewable energy forms other than wind power, consideration should be given to:

The proximity to the renewable energy source

The relationship with the existing natural and built environment

The availability of existing surplus industrial land in close proximity to the transport network

The benefits of smaller scale grid and non-grid connected generation.

8.10 The Regional Energy Strategy 2005 sets out how the region is bidding to become the ‘sustainable region’ through a series of energy related policies. The SPD broadly follows the overall aims of these policies in seeking to reduce the impact of development on the environment

Local

8.11 The adopted Leicestershire, Leicester and Rutland Structure Plan (1996 – 2016) contains the following policies on energy efficiency and renewable energy:

Resource Management Policy 2: Energy Efficiency

All proposals for development of individual buildings, mixtures of land uses and land use patterns will be expected through design, layout, use of materials and relationship of different land uses, to take full account of their ability to:

a) minimise the consumption of energy resources, particularly non-renewable energy;

b) promote a more efficient use of energy resources;

c) promote walking, cycling, economic operation of public transport, rail freight and waterborne transport; and

d) reduce the need to travel by car."

8.12 Resource Management Policy 3: Energy Installations

Proposals for energy generating installations will be permitted provided that:

- any adverse impact is minimised and outweighed by the wider benefits that the proposal may bring;
- they do not adversely affect designated environmental assets or designated landscape features;
- they meet high environmental standards;
- they can demonstrate that they meet energy requirements;
- they are, as far as practicable, well located in relation to the existing electricity transmission network; and
- they offer, where possible, scope for heat recovery for example by the use of Combined Heat and Power technology.

The generation of energy from renewable sources will be encouraged and particular account will be taken of the wider environmental benefits of using renewable energy sources.

8.13 The relevant planning policies for energy from waste developments are found in the Adopted Leicestershire, Leicester and Rutland Waste Local Plan (1995-2006):

Policy WLP3: Anaerobic Digestion

Planning permission will be granted for anaerobic digestion plants provided the following criteria are met:

(I) Any digestate produced as a residue of the process can be satisfactorily managed and disposed;

(II) The proposed operations do not cause demonstrable harm to interests of acknowledged importance having regard to Policy WLP 8;

(III) Energy recovery is maximised where appropriate.

8.14 Policy WLP 5: Incineration

Planning permission will be granted for waste incineration provided all the following criteria are met:

(I) Pre-sorting of waste is carried out, where appropriate, prior to its incineration;

(II) Energy recovery is maximised, including the production of combined heat and power where appropriate;

(III) Proposals meet the criteria in Policy WLP8.

8.15 The key Deposit Draft Replacement City of Leicester Local Plan policies relating to energy efficiency and renewable energy are given at the beginning of this Supplementary Planning Guidance on page 5.

9.0 Statement of Consultation

The following agencies have been consulted in the preparation of this document:

Consultee:	Issues Raised:	Response:
English Nature	• Relevant Data to be sourced from Leicestershire Environmental Resources Centre	• Data has been requested from the centre
	• Effects on Biodiversity should be considered when designing small scale hydro and biomass planting in Green Wedges	• Reference is made at he end of Table 2, that any renewable technology requiring planning permission will be considered in the policies of the City of Leicester Local Plan. As Green Wedges and the river are afforded a level of extra protection from policies GE01 – GE05 which include biodiversity protection.
English Heritage	• Has the conservation team been involved in the preparation of the document	• The Urban Design Group which contains the conservation team were consulted during the preparation of this document
The Environment Agency	• No critical comments	• N/A
The Countryside Agency	• Regional Energy Strategy should be considered in the SPD	• While not originally made explicit, the SPD broadly follows the themes of the Regional Energy Strategy. Specific reference to this will be included in future revisions.

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23. Leicester Energy Strategy, Leicester City Council
24. City of Leicester Climate Change Strategy, October 2003, Leicester City Council