



*Dacorum Borough Local Plan
1991 - 2011*

**SUPPLEMENTARY PLANNING DOCUMENT
ENERGY EFFICIENCY AND CONSERVATION**



July 2005

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1. Introduction

- 1.1 The current energy consumption in Hertfordshire is unsustainable. Too much energy is being used and we are over reliant on fossil fuels to provide heating, lighting, cooling, power and transport needs.
- 1.2 The use of fossil fuels is increasing the effects of climate change, which will result in milder winters and increased summer temperatures, which means more attention will need to be given to cooling requirements in all buildings. Fossil fuels should therefore be used more efficiently until alternative fuel sources are widely available.
- 1.3 The Government's commitment is to reduce carbon dioxide (CO₂) emissions by 20% below the 1990 levels by 2010 and 60% by 2050. To help achieve this target, the design and development of buildings should incorporate measures to achieve energy efficiency and the use of renewable energy. These should be considered at the outset to reduce the amount of energy needed by buildings.
- 1.4 This guideline complements and amplifies Policy 122: Energy Efficiency and Conservation in the Dacorum Borough Local Plan 1991-2011 which requires new developments to incorporate appropriate energy efficient measures through:
 - (a) building design,
 - (b) site layout; and
 - (c) landscaping

2. Policy Background

Government Guidance

- 2.1 Planning Policy Statement 22 (Renewable Energy) states that 'renewable energy is not the only solution to limiting emissions of greenhouse gases. On the demand side, energy efficiency can also make a substantial impact on reducing the demand for energy. The Government is taking measures to encourage the exploitation of these potential savings' (paragraph 7).
- 2.2 Planning Policy Guidance Note 3 (Housing) encourages consideration of energy efficiency. It states 'The Government attaches particular importance to the greening of residential environments...Well designed layouts can also contribute to the energy efficiency of new housing' (paragraph 52).

Regional Planning Guidance

- 2.3 Policy INF4 in RPG9 states that in planning the future development of the region and activities within it, priority should be given to energy conservation and to maximising the use of renewable energy sources as an alternative to fossil fuels.
- 2.4 RPG9 (The South East) states that 'Improved energy efficiency should be a key component of all types of development.' (paragraph 10.23)
- 2.5 The demand for energy can be reduced, for example, by more effective insulation of buildings and through attention to energy efficiency best practice measures in design, layout and orientation of all building types. Combined Heat and Power (CHP) as part of a local community heating scheme can increase energy savings to residents, as well as optimise reductions of carbon dioxide and contribute to urban renaissance (paragraph 10.34). This needs to be considered at the earliest stage of development because of the infrastructure required.

Draft Regional Spatial Strategy

- 2.6 The East of England Regional Assembly are preparing the first draft of RSS 14 to replace RPG 9 and RPG 6 (East Anglia) and provide a unified RPG for the whole of the East of England Region. Under the new system outlined in the draft Planning Policy Statement 11 (PPS 11) Regional Planning, non statutory Regional Planning Guidance is to be replaced by statutory Regional Spatial Strategies (RSS)
- 2.7 One of the objectives set out in draft RSS14 (East of England) is to minimise the demand for use of resources including energy supplies, whether finite or renewable, by encouraging efficient use, re-use or use of recycled alternatives, and by trying to meet needs with minimum impact.
- 2.8 Policy ENV 8 of RSS 14 states that this will be achieved by requiring developers to maximise energy efficiencies to be gained from sustainable

design and construction, community heating and combined heat and power schemes. This will also be achieved by encouraging developers to strive to achieve energy efficiency standards that exceed minimum standards.

Energy White paper: 'Our energy future – creating a low carbon economy'
(February 2003)

- 2.9 The Energy White Paper lays out the Government's new energy policy to create a low carbon economy by tackling environmental (climate) change, security of supply, competitiveness and social issues. It recognises that energy efficiency can make a big contribution to carbon cuts and proposes actions to tighten Building Regulations, improve product standards and encourage greater energy efficiency in homes and offices.
- 2.10 It highlights the key role of the planning system in translating energy objectives into sustainable action.

Hertfordshire Sustainable Development Guide Draft Version (March 2003)

- 2.11 The draft Hertfordshire Sustainable Development Guide supports efforts to improve the sustainability of all new development including supplying and using energy sustainably. Its aim is to promote energy conservation, energy efficiency and the use of renewable energy as well as supporting the adoption of new and more benign technologies. Further work is being undertaken to progress a final version of the document towards publication.

3. Principles for Designing in Energy Conservation: Guidance for Development

- 3.1 Almost half of the energy used in the UK and most of the UK's CO₂ emissions are associated with buildings. For example, dwellings alone account for 30% of the UK energy consumption and 28% of the resulting CO₂ emissions.
- 3.2 The amount of energy consumed and thus carbon dioxide produced is effected by the building's energy efficiency, which is largely determined by its design. The aim is to encourage energy efficient buildings that use the minimum amount of energy to provide for the intended function of the buildings.
- 3.3 All new developments should be built to the highest energy conservation standards and should adopt passive solar design principles to achieve this. Careful control over the height, mass and density of the built form together with consideration of siting, orientation and landscaping will directly affect energy consumption and the overall quality of the environment. This is illustrated below:

Site Planning

- Layout and orientation

- 3.4 Wherever possible buildings should be orientated to ensure that principal rooms face south to benefit from solar gain (ideally within 30 degrees of south) leaving unoccupied rooms such as storage and rooms with a lower heat demand to be positioned to the north side of the building. Large windows on the northern elevation should be avoided. Building orientation should also take into account the effects of wind.

- Building form

- 3.5 Higher density developments, for example terraced housings or flats, normally have lower energy consumption than detached housing. Higher density developments also increase the viability of district heating linked to Combined Heat and Power (ref. section 5). Semi-detached, terraced houses and flats also give rise to less heat loss than detached housing.

- Overshadowing

- 3.6 Overshadowing should be avoided by ensuring adequate spacing between buildings. Reducing the amount of overshadowing will help to maximise the potential for solar gain in the development and for adjoining sites.

- Landscaping

- 3.7 Tree and shrub planting schemes can act as windbreaks, reducing the wind chill factor and sheltering surfaces from the cooling effects of wind: landscaping should be planted in the direction of the prevailing winds

Design and Materials

- 3.8 A significant amount of energy can be used in the transportation of building materials. This can be reduced through the use of local construction materials and local builders. The use of local materials will also strengthen the local economy and helps to reinforce local identity through new building design.
- 3.9 New developments should be designed to encourage the use of natural light, ventilation and cooling to the greatest extent possible.
- 3.10 Buildings should also be designed to high insulation levels for both heat and sound attenuation. They should be designed to avoid unwanted draughts through the building framework by maximising insulation and draught proofing of walls, roofs, windows and floors, but have adequately controlled ventilation. The use of conservatories should be considered to maximise solar heat gains throughout the year, and porches to protect from draughts.
- 3.11 Natural ventilation features should be integrated into the design to minimise the potential for overheating and avoid cooling demands.
- **BREEAM** Building Research Establishment Environment Assessment Model
- 3.12 BREEAM sets out principles for designing and constructing sustainable buildings and measuring the overall environmental impact of a development project on a scale of pass, good, very good and excellent. This would include use of materials to limit heat loss, and use natural light and ventilation. A range of BREEAM standards has been prepared for housing (EcoHomes), offices, industrial developments, and supermarkets.

4. Large Scale Developments

- 4.1 Large scale developments should apply the principles outlined above to maximise the energy efficiencies to be gained from sustainable design and construction. They should also incorporate community heating and Combined Heat and Power systems where it is feasible to do so. Energy consumption statements should be prepared for development proposals above a threshold of 1,000 square metres or 50 dwellings in order to ensure that the technical, environmental and economic feasibility of these systems is considered and is taken into account before construction starts.
- 4.2 40% of energy costs in large commercial developments can be accounted for by lighting. Energy use for lighting in all buildings can be minimised by ensuring good access to natural light. This will be affected by orientation, built form and the internal layout of the building.

5. Sustainable/Renewable Energy Technologies

- 5.1 Where appropriate, buildings should not only be designed for energy efficiency but also where appropriate should enable the use of renewable energy or renewable energy technology and combined heat and power and district heating schemes. It is increasingly possible to incorporate renewable energy technologies into new developments.
- 5.2 By choosing the most appropriate technology for a development, energy efficient measures and renewable energy sources can be incorporated into any style and type of building resulting in higher levels of energy conservation. Examples are illustrated below:

Wind Energy

- 5.3 Small wind turbines may be able to be incorporated into some developments. The power generated by these will generally be insufficient to power the whole development but can be combined with another source. Wind turbines should be sited so as to limit the visual impact on the amenity of adjoining buildings and in certain locations such as conservation areas they are not encouraged.

Solar Energy

- 5.4 Solar energy can be used on different scales in most types of development. The principle is to optimise the amount of energy that can be derived from the sun. This can be achieved through the careful design and orientation of a building or whole development. There are three main ways of using solar energy:

i. Passive Solar Energy

Passive solar design is the concept of designing a building to reduce the need for additional building energy services by minimising heat loss in winter and heat gain in summer and using natural light and ventilation as much as possible. This would include:

- Solar gain for heating through proper orientation;
- Maximising the insulation value of the building fabric;
- Natural lighting and ventilation where possible; and
- Solar overshadowing and reduction of summer heat gain;

And avoid:

- Over-heating due to excess solar gain in the summer;
- Poor internal air quality in polluted urban areas; and
- Excessive heat losses through large glazed areas.

ii. Solar Water Heating

Solar water heating requires the installation of a water collector, usually in the roof. Water is pumped through a collector, absorbing heat from solar radiation.

Solar panels can be incorporated into the structure of the roof to supplement water heated by conventional systems.

iii. Photovoltaic

Photovoltaic (PV) cells convert solar radiation into electricity. PV can be incorporated into roofing materials, cladding and gazing, enabling electricity to be generated from the sun.

- 5.5 Solar panels should be sensitively located on buildings so as to avoid spoiling their appearance. Roof slopes fronting onto streets and open spaces should be avoided where possible. Solar panels will not be acceptable on fronting roof slopes or other prominent roofs in conservation areas or any visible roof of a listed building. There may however be opportunities to fit them sensitively.

Combined Heat and Power (CHP)

- 5.6 CHP is a very efficient technology for generating electricity and heat together.
- 5.7 Electricity production creates heat as a by-product, which is usually dispersed into the atmosphere. CHP recovers this heat and distributes it alongside electricity in the form of hot water for space heating. By capturing and using waste heat, CHP can be up to 40% more efficient than conventional methods of heat and power production.
- 5.8 It is encouraged in high density, mixed use developments or developments such as hospitals, hotels and swimming pools where there will be substantial demands for heat and hot water throughout each day and throughout the year.

6. Further Information:

Building Research Establishment: <http://www.bre.co.uk> provides further information on the BREEAM and EcoHomes assessment and provides guidance on building construction, energy efficiency and sustainable use of energy.

Carbon Trust: <http://www.thecarbontrust.co.uk>

Combined Heat and Power Association: <http://www.chpa.co.uk> provides information and promotes the use of CHP technologies

Design Advice: <http://www.designadvice.co.uk> provides advice on the energy efficient and environmentally conscious design of buildings.

Energy Efficiency Advice Centre: <http://www.saveenergy.co.uk> provides free advice on energy use in the home, grants, efficient heating systems and appliances.

Energy Savings Trust: <http://www.est.org.uk> can provide grants for photovoltaic installations at all scales of development and useful advice on energy saving techniques.