

Chapter 6 Climate Change



Scotland Farm, Dry Drayton, South Cambridgeshire

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Chapter 6 Climate Change

- 6.1 An important issue for the Local Plan is how we can proactively prepare to meet the predicted impacts of climate change. Day-to-day activities and lifestyles are releasing significant quantities of greenhouse gases into the atmosphere evidently affecting the climate in ways that could threaten how we live both today and tomorrow. Greenhouse gas emissions are the collective name for a range of gases that trap some of the sun's warmth within the earth's atmosphere, and the most prevalent greenhouse gas is carbon dioxide.
- 6.2 To meet national targets for reductions to greenhouse gas emissions it is necessary for new developments to be designed to be more energy efficient and to maximise the generation of renewable and low carbon energy. Whilst new development in the district provides an opportunity to deliver sustainable schemes, these opportunities will need to be balanced with retaining the district's unique built and natural heritage and character.
- 6.3 Some policy options have an initial additional cost, compared to conventional solutions; however these new solutions will result in lower energy and water bills once installed and may generate a financial return to property owners through Government schemes.



Key Facts:

- The district has significantly less completed renewable energy generation capacity than the other three rural districts in Cambridgeshire.
- In March 2011 there were planning permissions for approximately 35MW of renewable energy from 18 wind turbines, a solar energy farm, a biomass boiler, and 8 domestic arrays of photovoltaic panels although some of these planning permissions may not be implemented.
- Planning permission for the first community wind turbine in the district, near Gamlingay, was approved in April 2012.
- Gas and electricity consumption in the district has fallen in the last few years however fuel poverty is affecting 13.5% of households.
- The Sustainable Parish Energy Partnership consists of 29 Parish Councils working with volunteers to help residents cut fuel bills and reduce carbon emissions.
- Environmentally friendly show homes for new developments have been opened at Cambourne and Trumpington Meadows.
- The district is designated an area of Serious Water Stress with areas subject to flood risk.

Mitigation and Adaptation to Climate Change

6.4 The planning system can help in addressing concerns about climate change by requiring new developments to be designed and constructed in ways that reduce carbon dioxide emissions (mitigation), and by including design solutions that take account of the effects of climate change (adaptation), such as managing flood risk and using water efficiently. The NPPF requires that local planning authorities adopt proactive strategies to mitigate and adapt to climate change.

Issue 17: Mitigation and Adaption to Climate Change

The Local Plan could ensure that development will only be permitted where the principles of climate change mitigation and adaptation are embedded within the proposal.

To mitigate climate change, proposals could demonstrate:

- energy efficiency;
- use and generation of renewable and low carbon energy;
- promotion of sustainable forms of transport and reduction of car use;
- recycling and waste reduction both during construction and occupation; and
- inclusion of broadband to facilitate home working.

To adapt to the effects of climate change, proposals could demonstrate:

- water use management and conservation;
- management of flood risk to acceptable levels;
- open space and vegetation for shading and cooling, and to detain surface water run-off;
- use of sustainable drainage systems (SuDS); and
- layout, orientation, design, and material measures to minimise overheating.

Question 17:

Have the right issues for addressing climate change mitigation and adaptation been identified?

Please provide any comments.

Renewable Energy

- 6.5 The National Planning Policy Framework (NPPF) states that local planning authorities should recognise the responsibility on all communities to contribute to energy generation from renewable and low carbon sources and Government has committed to sourcing 15% of energy from renewable sources by 2020. Using renewable and low carbon energy technologies to generate either electricity or heat will help to reduce greenhouse gas emissions and will also improve the security, availability and affordability of energy by increasing the range of sources we rely on. Renewable and low carbon energy utilises natural sources and includes technologies such as photovoltaic panels, wind turbines, solar thermal panels, air or ground source heat pumps, anaerobic digestion plants, and biomass boilers. These technologies need to be located onsite or close to the energy users.
- 6.6 The Cambridgeshire Renewables Infrastructure Framework (CRIF) published January 2012 identifies South Cambridgeshire as having the second greatest potential for renewable energy generation in the county. The district has a theoretical potential of providing over 5,000 GWh of renewable energy, however the calculations do not take any account of specific constraints including impact on landscape, townscape and heritage assets.
- 6.7 The Council's Climate Change Action Plan 2011-2013 supports community led renewable and low carbon energy initiatives as a key objective. Planning permission for the first community wind turbine in the district, located near Gamlingay, was granted in April 2012. Through the South Cambridgeshire Sustainable Parish Energy Partnership, the Council is encouraging further community renewable energy projects.
- 6.8 In February 2011, local councillors resolved to consider imposing a minimum separation distance of 2 km between a wind farm and any residential property, to protect residents from disturbance and visual impact. The resolution continued that if the applicant can prove this is not the case a shorter distance will be considered.
- 6.9 The Government received comments on its draft National Policy Statements for Energy Infrastructure that argued that a French study and also Scottish regulations ban wind farms within 2 km of human habitation. In responding to the comments, the Government stated that these allegations are unfounded and therefore there is no rationale for imposing a ban as suggested. The Government also concluded that such a ban would, for most purposes, be impractical in England as suitable sites are likely to be within 2 km of residences. Specific evidence to support 2 km as a minimum separation distance has not been found but it is included as a consultation option.

Issue 18: Renewable and Low Carbon Energy Developments

The National Planning Policy Framework states that local planning authorities should deliver renewable and low carbon energy in their area. This is about proposals for specific developments that involve generating renewable and low carbon energy. The Local Plan could do this by:

- designing policies to maximise provision while ensuring adverse impacts are addressed;
- considering identifying suitable areas for renewable and low carbon energy developments; and
- supporting community led initiatives for generation.

Given the nature of the landscape and townscape of South Cambridgeshire it is not considered appropriate to identify suitable broad locations for renewable and low carbon energy developments and supporting infrastructure in the Local Plan.

- A. To maximise the generation of renewable and low carbon energy in the district, the Local Plan could:
- i. Include a criteria based policy seeking to maximise the generation of renewable and low carbon energy identifying the issues that would need to be addressed including:
- impact on heritage and natural assets;
 - impact on the amenity of nearby residents;
 - connections to national energy infrastructure unless meeting onsite needs only;
 - decommissioning once the operation has ceased;
 - engagement with the local community and local authority;
 - impact on high grade agricultural land; and
 - cumulative noise, visual and landscape impacts.
- ii. Include a criteria based policy specifically requiring a separation distance of 2 km between a proposed wind farm (2 or more wind turbines) and any residential property, to protect residents from disturbance and visual impact. If the applicant can prove this is not the case a shorter distance will be considered.
- B. The Local Plan could identify future growth areas or new settlements as potentially suitable locations for the inclusion of renewable or low carbon district heating systems, such as biomass combined heat and power plants.

Question 18:

A: What approach do you think the Local Plan should take for the generation of renewable and low carbon energy?

- i. Include a criteria based policy seeking to maximise the generation of renewable and low carbon energy in the district and identifying the issues that would need to be addressed, and this would leave developers to make applications for their preferred areas.
- ii. Include a criteria based policy as set out in option i, but specifically requiring a separation distance of 2 km between a proposed wind farm (2 or more wind turbines) and any residential property, to protect residents from disturbance and visual impact. If the applicant can prove this is not the case a shorter distance will be considered.

B: Should the Local Plan identify future growth areas and new settlements as potentially suitable locations for the inclusion of renewable or low carbon district heating systems?

C: What type of renewable and low carbon energy sources should the Local Plan consider and at what scale?

Please provide any comments.

Issue 19: Renewables in New Developments

New developments, such as housing, employment and community uses, can generate their own renewable energy by incorporating smaller technologies such as solar panels into their design. An emerging evidence base study on the effectiveness of the Council's existing planning policy for onsite renewable and low carbon energy generation has suggested that all new homes and all buildings for other uses of 1,000 m² or more should be required to install either solar thermal panels (which provide hot water) or photovoltaic panels (which generate electricity). This would not preclude the use of other low carbon or renewable energy sources on sites where more extensive carbon savings are sought or greater energy self-reliance is required. Given the nature of 'solar' technologies, it is not reasonable to require more than 10% of a building's predicted energy requirements to be provided from renewable energy technologies. To achieve more than 10% of a building's predicted energy requirements from renewable energy would require a combination of 'solar' and non-'solar' sources.

The emerging study also suggests that for landlord estates, such as universities or research institutions, the installation of a site wide renewable energy solution would deliver higher carbon savings for a lower cost. That could involve a full range of renewable energy technologies including an onsite biomass combined heat and power district heating system.

Question 19:

To what extent should new development provide for onsite renewable energy generation?

- i. All new developments should be required to provide onsite renewable energy? If so, should 10%, 15% or 20% equivalent provision be required?
- ii. Small scale developments of less than 5 dwellings or less than 500 m² of non-residential floor space should be exempt?
- iii. No requirements for renewable energy generation should be made.

Please provide any comments.

Community Energy Fund

- 6.10 It is likely that the Government's zero carbon policy, which is due to be introduced for new homes from 2016 and for non-residential buildings from 2019, will require new developments to achieve zero carbon from 'regulated' emissions (essentially those arising from heating, lighting and ventilation) using a combination of onsite energy efficiency solutions and renewable and low carbon energy generation and offsite 'allowable solutions'. One possible offsite 'allowable solution' that would retain the benefits locally is the establishment of a Cambridgeshire Community Energy Fund.

Issue 20: Community Energy Fund

A Cambridgeshire Community Energy Fund would use developer contributions to invest in energy efficiency and renewable and low carbon energy projects in the county. Further work is needed to develop a suitable collection mechanism for payments to the Community Energy Fund; however the basis for any mechanism would have to be established in the Local Plan.

Question 20:

A: Should the Local Plan enable the setting up of a Community Energy Fund that would allow developers to invest in offsite energy efficiency and renewable and low carbon energy projects to meet their carbon reduction targets?

i: Yes?

ii: No?

B: Are there other Alternatives?

Please provide any comments.

Sustainable Design and Construction

- 6.11 In order to secure the reductions in greenhouse gas emissions envisaged by the NPPF, and support the mitigation and adaptation to climate change, the Council could consider requiring buildings to be of a higher standard of design and construction than the national Building Regulations. However this needs to be considered in the context of the impact on development viability. The design of new buildings, including their orientation, internal layout, and shading from adjacent buildings and vegetation, has a significant influence on energy efficiency. The fabric of a building also influences energy efficiency as high performance materials and construction methods can minimise energy, heat and carbon loss.
- 6.12 Improving the energy efficiency of existing buildings is important as the existing building stock within the district emits significant levels of carbon emissions principally from space heating and cooling, water heating, and lighting. The planning system has limited influence over improving the energy efficiency of existing buildings.
- 6.13 A careful approach is required when considering adapting heritage assets to climate change to ensure that any changes are balanced with the conservation and preservation of the heritage asset (see Issue 44 in Chapter 8: Conserving and Enhancing the Natural and Historic Environment).
- 6.14 The Code for Sustainable Homes and the Building Research Establishment Environmental Assessment Method (BREEAM) standard for non-residential buildings are nationally recognised standards for measuring the sustainability of buildings. Both standards require high energy efficiency of buildings and high standards of water efficiency beyond the standards set by current Building Regulations, but also assess wider sustainability considerations such as waste and recycling, pollution, health and wellbeing, and construction materials.
- 6.15 There are cost implications of achieving the higher levels of the Code for Sustainable Homes and BREEAM non-residential standard. These additional costs on development could have implications on the provision of infrastructure such as affordable housing, educational facilities, community facilities, and public open space, or a financial contribution towards off-site provision of such infrastructure.
- 6.16 Existing planning policies already require higher standards in some areas. The North West Cambridge Area Action Plan requires Code for Sustainable Homes Level 4 for any dwellings approved on or before 31 March 2013 (up to a maximum of 50 dwellings) and Level 5 for any dwellings approved on or after 1 April 2013. An existing planning policy for the former Land Settlement Association estate at Fen Drayton allows ground-breaking and experimental forms of sustainable living, which has been defined as the achievement of Code for Sustainable Homes Level 6 and BREEAM non-residential 'outstanding' standard (see Issue 113 in Chapter 13: Site Specific Policies). A requirement to achieve Level 6 in other locations within the district is not currently deemed a viable option.

Issue 21: Sustainable Design and Construction

The Local Plan could require minimum levels of the Code for Sustainable Homes and the BREEAM non-residential standard to be achieved by all new developments. Higher standards could be set for specific types or sizes of development and flexibility could be written into the policy to enable the standards chosen to be increased over time.

Estimates of the additional cost per dwelling of achieving the energy use requirements of different levels of the Code for Sustainable Homes and achieving the complete Code for Sustainable Homes level (based on a 3 bed semi-detached dwelling) are set out in figure 9. It should be noted that energy efficiency standards in Building Regulations are planned to increase over the next few years, bringing them in line with higher levels of the Code for Sustainable Homes. This means the energy element (set out in figure 9) will become part of normal development costs.

Figure 9: Estimates of the additional cost per dwelling of achieving different levels of the Code for Sustainable Homes

		Level 3	Level 4	Level 5	Level 6
Date of change to energy efficiency requirements of building regulations		Now	2013	2016	
Small Brownfield (20 dwellings at 40 dph)	Energy	£120	£3,393	£12,673	£27,393
	TOTAL *	£1,160	£4,583	£19,998	£34,718
Edge of Town (100 dwellings at 40 dph)	Energy	£120	£3,393	£13,523	£28,388
	TOTAL *	£1,588	£5,361	£21,326	£36,191
Strategic Greenfield (2,000 dwellings at 40 dph)	Energy	£120	£3,393	£13,523	£28,388
	TOTAL *	£1,571	£5,344	£21,309	£36,174

* These figures include the costs set out in Issue 24 necessary to achieve the water efficiency requirements.

Question 21:

What sustainable building standards should be required in new developments?

- i. Developments would only have to comply with Building Regulations requirements for energy efficiency.
- ii. All new buildings would comply with sustainable building standards. If so, should all new dwellings meet at least Code for Sustainable Homes Level 4, and all non-residential schemes meet at least the BREEAM 'very good' standard?
- iii. The zero carbon standard (Code for Sustainable Homes Level 5) would be required in larger scale developments?

Sustainable Show-Homes

- 6.17 Many buyers like to see what something will look like before they make a decision, and therefore on new developments that include show-homes it is possible to showcase environmentally friendly alternatives for finishes, materials, fixtures and technologies as options that can be purchased when a dwelling is bought off-plan. The Council has secured the provision of sustainable show-homes at Trumpington Meadows and Cambourne.

Issue 22: Sustainable Show-Homes

The Local Plan could require all developments that provide a show-home to include a sustainable show-home that will demonstrate environmentally sustainable alternative finishes, materials, fixtures and technologies that could be purchased when a dwelling is bought off-plan.

Question 22:

What approach to sustainable show-homes should we take?

- i. Rely on negotiating their provision on an individual site basis?
- ii. Require all developments that include a show-home to provide a sustainable show-home?
- iii. Require developments of over 15 dwellings to provide a sustainable show-home?

Construction Methods

- 6.18 The construction process for any new development utilises a significant amount of resources and generates construction waste and spoil. It is therefore important that as well as designing developments to be sustainable when complete, development should take account of the principles of sustainable development during the construction process.
- 6.19 Construction of new developments can adversely affect the amenity of surrounding occupiers and the local environment, through the generation of noise, smells and dust. These impacts can be minimised through the use of haul roads, restrictions on hours of operation, and the appropriate siting of storage compounds.

Issue 23: Construction Methods

To minimise the adverse impacts generated by the construction process, the Local Plan could ensure:

- careful management of materials already onsite (including soils) or brought to the site to reduce the amount of waste produced and maximise the reuse or recycling of materials either onsite or locally; and
- contractors are considerate to neighbouring occupiers by restricting the hours of noisy operations, requiring the provision of haul roads for larger developments, and siting storage compounds to avoid impacts on existing businesses and residents.

Question 23:

What approach should the Local Plan take to construction methods:

- i. Continue to include a construction methods policy?
- ii. Not specify construction methods in the Local Plan?

Sustainable Drainage, Water Management and Flood Risk

- 6.20 Water Efficiency of New Housing: New housing development creates new demand for water. South Cambridgeshire lies in an area identified as at 'Serious Water Stress' by the Environment Agency. Water is a finite resource, and abstraction can have environmental costs. Cambridge Water Company's Resources Management Plan shows that beyond 2035, without additional resources or greater efficiency, the need for water to serve development will be greater than currently available supply. Cambridge Water Company are carrying out an enhanced programme of installing water meters to encourage reduced water use and are raising awareness of the need to save water.

- 6.21 The average person in the UK uses 150 litres of water per day. The current Building Regulations already require physical measures to be included in new developments aimed at encouraging reductions in levels of water use to 125 litres per person per day. These include dual flush toilets and efficient taps, showers, fixtures and fittings. Evidence included in the Cambridge Water Cycle Strategy shows that in a standard home, water consumption can be reduced to 105 litres per person per day (the equivalent of Code for Sustainable Homes Level 3 or 4) by installing water efficiency measures such as low flush toilets. However, to achieve water consumption of less than 80 litres per person per day (the equivalent of Code for Sustainable Homes Level 5 or 6) requires water recycling through rainwater harvesting or greywater recycling.
- 6.22 The Water Cycle Strategy estimates the costs associated with installing water efficiency measures to be £268 to reduce water consumption from 125 litres per person per day to less than 105 litres per person per day, and that this initial outlay would be recouped through savings to water bills in 2-3 years. It has been estimated that there is a considerable increase in costs (up to £4,500) to deliver the additional measures required to reduce water consumption to less than 80 litres per person per day.
- 6.23 Water Efficiency of Non-Residential Development: Non-domestic buildings, such as schools, community facilities, and offices, also have the potential to be more water efficient through installation of low flush toilets and urinals, aerated taps and showerheads, and through implementation of rainwater and greywater recycling systems. The BREEAM (Building Research Establishment Environmental Assessment Method) offers a way of testing water efficiency.

Issue 24: Water Efficiency of New Housing

Development can be designed to encourage less water usage.

Current Building Regulations require measures to reduce levels of use in new homes to 125 litres per head per day. There are no current proposals to change Building Regulations for water as there is for energy efficiency. The Code for Sustainable Homes includes a water element, with higher levels of the code requiring greater levels of water efficiency. Achieving the highest levels of the Code will generally require rainwater and greywater recycling systems, which can further increase development costs.

The development costs of seeking levels of water efficiency beyond Building Regulations needs to be balanced alongside other infrastructure priorities. It is also worth considering the implications for the occupiers of new housing. The Water Cycle Strategy estimates that achieving 80 litres per person per day would deliver savings to the end user of around £50 per person per year in water bills, and £20 per person per year for 105 litres, compared with the Building Regulations standard 125 litres.

Figure 10: Measures required to achieve Water Efficiency Standards in New Residential Developments

	Litres per person per day	Additional measures needed to achieve standard	Additional costs above current Building Regulations (Source: CLG 2010)	Estimated value of water saving per person per year
Building Regulations	125	Currently require: dual flush toilets and efficient taps, showers, fixtures and fittings	N/A	N/A
Code for Sustainable Homes 3 / 4	105	Low flush toilets and more water efficient taps, shower heads, washing machines and dishwashers	£268	£21
Code for Sustainable Homes 5 / 6	80	Further efficiency in household taps; installation of lower fill baths; Greywater recycling (GWR) or rainwater harvesting (RWH)	£1,750 (for a flat) to £4,500	£50

Source: Adapted from table 3-3 of Cambridge Area Water Cycle Strategy 2011. Cost savings based on formula from paragraph 3.3.17 of Water Cycle Strategy.

Question 24:

What approach should the Local Plan take on water efficiency in new housing development?

What are your views on the following options?

- i. Rely on Building Regulations standards to reduce water use below the average existing levels.
- ii. Seek additional measures such as water efficient fixtures and fittings (to achieve equivalent of Code 3 or 4 of Code for Sustainable Homes), subject to financial viability.
- iii. Seek grey water or rainwater recycling (to achieve equivalent of code 5 or 6 of Code for Sustainable Homes), subject to financial viability.

Please provide any comments.

- 6.24 Water Quality: Water quality is the chemical, biological and physical quality of water bodies. The EU Water Framework Directive requires all inland and coastal waters to achieve 'good status' by 2015 or, where this is not possible, by 2021 or 2027. In South Cambridgeshire the majority of rivers are currently of moderate or poor ecological status. In much of the south east of the district the underlying geology is chalk, providing a significant source of groundwater which is used for public drinking water supply. It is particularly important that the quality of this water is protected from pollution in these areas.

Issue 25: Water Quality

The Local Plan needs to ensure that development does not result in deterioration of water quality, and opportunities are taken for enhancement to support achievement of the Water Framework Directive standards.

Policies should ensure that:

- There is adequate water supply, sewerage and land drainage systems (including water sources, water and sewage treatment works).
- Development would not harm quality of ground, surface or water bodies, and opportunities are taken for improvements to water quality, including hydromorphology and ecology.
- Foul drainage to a public sewer should be provided but where not feasible, alternative facilities must not pose unacceptable risk to water quality or quantity.
- Appropriate consideration is given to sources of pollution, and appropriate Sustainable Drainage Systems (SuDS) measures incorporated to protect water quality from polluted surface water runoff.

Question 25:

A: Have the right approaches to managing, protecting and enhancing water quality been identified?

B: Are there any other issues which should be included?

Please provide any comments.

6.25 Sustainable Drainage Systems: Well planned and well-designed surface water management infrastructure can contribute to the creation of sustainable communities. It can provide a flood risk management function alongside benefits for amenity and biodiversity and be linked to a network of green (and blue) open spaces. It can also help improve the quality of water as it passes through the system. This needs to be considered from the beginning of the design process. As a result of the Flood and Water Management Act 2010, Sustainable Drainage Systems (SuDS) will soon be required for all developments. However, SuDS are often seen as additions to development, and do not fully realise their potential multifunctional benefits. The increasing emphasis on SuDS is something we need to consider in the Local Plan.

Issue 26: Sustainable Drainage Systems / Managing Flooding

Development proposals should ensure that sustainable surface water drainage is integrated within the built environment:

- Development should demonstrate it is aligned with the forthcoming National SuDS Standards, and local Cambridgeshire SuDS Manual.
- Surface water drainage proposals should maximise opportunities to create amenity, enhance biodiversity, and contribute to a network of green (and blue) open space.
- Surface water drainage should be considered at an early stage of the master planning process, to allow maximum integration of drainage and open space.
- Proposals should demonstrate maximum use has been made of low land take drainage measures, such as green roofs, permeable surfaces and water butts.

Question 26:

A: Have the right approaches to managing water and drainage sustainably been identified?

B: Are there any other issues which should be included?

Please provide any comments.

- 6.26 Flood Risk: National planning policy requires a risk based sequential approach to flood risk, to avoid high risk areas and steer development to areas at lower risk, and this needs to be reflected in the Local Plan. As well as minimising risk to the development itself, development should not increase flood risk elsewhere, and opportunities should be taken to reduce risk downstream, such as by reducing run off rates.
- 6.27 South Cambridgeshire District Council, in partnership with Cambridge City Council, commissioned a Strategic Flood Risk Assessment, which explores the nature and extent of flood risk across the area, taking account of the anticipated impacts of climate change. In addition, Cambridgeshire County Council, now the lead local flood management authority, has prepared a Surface Water Management Plan. These have been used to assess options for development for allocation in the Local Plan, and should be used to support the consideration of planning applications.

Issue 27: Flood Risk

The Local Plan could include a policy to manage development and flood risk. The policy should include:

- Applying the risk based sequential approach to flood risk established through the National Planning Policy Framework and supporting Technical Guidance.
- Requiring development to utilise opportunities for flood risk management to reduce flood risk elsewhere, including discharge of surface water limited to greenfield rates or lower.
- Requiring applicants to consider available sources of information including the Strategic Flood Risk Assessment, and the Surface Water Management Plans. Development proposals in locations that have been subject to previous localised flooding events (including surface water, groundwater, or sewer floods) will need to demonstrate that the issue has been taken into account and appropriate mitigation measures incorporated.

Question 27:

A: Have the right approaches to managing flood risk been identified?

B: Are there any other issues which should be included?

Please provide any comments.