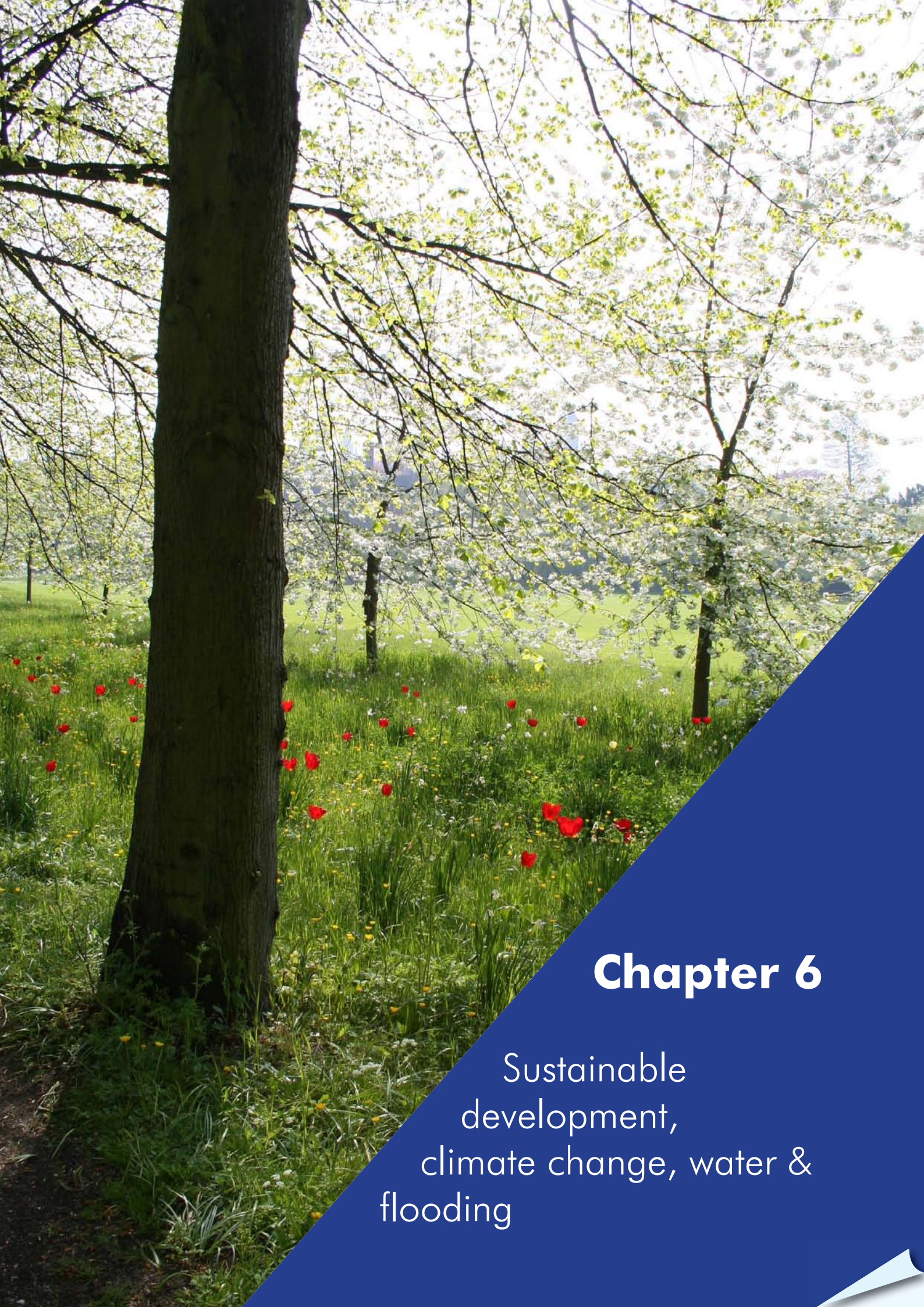

Chapter 6

Sustainable development, climate change, water & flooding

CHAPTER 6 – SUSTAINABLE DEVELOPMENT, CLIMATE CHANGE, WATER AND FLOODING

6.1 The Local Plan will seek to ensure that Cambridge develops in the most sustainable way possible. This means delivering our social and economic aspirations without compromising the environmental limits of the city for current and future generations. The vision for Cambridge is for it to become a low carbon, water sensitive city with a thriving economy. For this to be achieved, a holistic approach to sustainable development should be embedded within all development proposals from the outset.

6.2 This section focuses on how the Local Plan will contribute to the achievement of sustainable development. It looks at how the Local Plan will address the challenge of mitigating and adapting to our changing climate. It also considers how to make Cambridge a water sensitive city, where new developments are water neutral, contribute to an overall flood risk reduction and help improve the quality of water bodies.

STRATEGIC PRIORITY

Option 41 – Innovative and sustainable communities

To deliver truly sustainable communities that balance environmental, social and economic goals, making best use of energy, water and other natural resources, securing radical reductions in carbon emissions, minimising environmental impact and that are capable of adapting to the impacts of climate change.

Key Facts

CLIMATE CHANGE

- The total carbon emissions for the City of Cambridge, including those from homes and businesses, reduced by 9% between 2005 and 2009 (from 768,600 tonnes to 706,100 tonnes). Per capita emissions in this period reduced by 16% from 6.9 tonnes per person two 5.8 tonnes per person[1].
- Compared to the microgeneration capacity of other cities in the East of England, Cambridge is performing quite well (Cambridge = 0.301 MWe, Norwich = 0.219 MWe, Peterborough = 0.283 MWe, Ipswich = 0.121 MWe)[2]. Some of these cities, do however, benefit from large scale renewable technology, for example a 12MW biomass plant in Norwich, while Peterborough's installed renewable energy capacity (excluding

[1] DECC (2009) National Indicator 186 Figures or 2005-2009 (http://www.decc.gov.uk/en/content/cms/statistics/local_auth/co2_las/co2_las.aspx)
[2] Source = AEA Microgeneration Index (www.aeat.com/microgenerationindex/)

microgeneration) is around 5MW.

- Fuel poverty is estimated to affect 14% (5,800) of households in Cambridge[3], although with rising fuel prices this figure is quite likely to have risen.
- Projected data[4] illustrating how the UK climate is projected to change as a result of climate change, shows that temperatures in Cambridgeshire are set to rise by between 2°C and 4.5°C by 2080. In urban environments such as Cambridge, this rise in temperature could be higher, exacerbated by the urban heat island effect. There are likely to be more extreme weather events such as heat waves and storms, causing severe incidents such as flooding.

WATER AND FLOODING:

- Current fluvial (river) flood risk - 986 people would be affected by a 1 in 100 year (1%) flood event and 1,745 people for a 1 in 1000 year (0.1%) event.[5]
- Future fluvial flood risk (in 2110) - 1,483 people would be affected by a 1 in 100 year event and 2,544 people for a 1 in 1000 year event[6].
- Based on these figures of potential flood risk, the current estimated economic damage from fluvial flood risk is £157,667 (annualised average damages), and in the future (2110) this would rise to £1.7 million (annualised average damages) [7] [8].
- 11,061 properties are currently at risk of pluvial (surface water) flooding[9].
- Estimated economic damages associated with pluvial (surface water) flood risk is up to £1,866,839 (annualised average damages)[10].
- Current water body quality status is: The Cam (upstream) - Poor, The Cam (downstream) - Moderate, Bin Brook - Moderate, Hobson's Brook –Moderate, Cherry Hinton Brook – Moderate[11]. The Water Framework Directive requires that all water bodies are at 'Good' status by 2015.

[3] Cambridge City Council (2009) Private Sector House Condition Survey
[4] UK Climate Projections (UKCP09)
[5] There are two commonly used ways of expressing how frequently a particularly depth or intensity of rainfall occurs. Return period such as 1 in 100 or 1 in 1000 is the average time interval between rainfall events of a given size. 1% or 0.1% is the annual probability of that event happening each year. Numbers from Environment Agency - Great Ouse Catchment Flood Management Plan 2010
[6] Environment Agency - Great Ouse Catchment Flood Management Plan 2010
[7] Environment Agency - Great Ouse Catchment Flood Management Plan 2010
[8] Annualised annual damages (AAD) is the average damage per year in monetary terms that would occur at each specific address point, within the modelled domain, from flooding over 100 years.
[9] Cambridge and Milton Surface Water Management Plan 2011
[10] Cambridge and Milton Surface Water Management Plan 2011
[11] Environment Agency – Anglian River Basin Management Plan 2009
[12] Environment Agency – Areas of Water Stress Final Classification 2007
[13] Cambridge Sub-Region Water Cycle Strategies 2008 and 2010

- Cambridge is within an Area of Serious Water Stress, which is a classification by the Environment Agency that assess the overall water resource balance for areas based on geographical and human factors[12].
- Water supply demand is likely to increase by 33% by 2031[13].

Objectives

- To ensure that Cambridge makes real progress in addressing climate change in terms of both:
  1. **Climate Change Adaptation** – making sure that new developments and the wider community are adaptable to our changing climate;
  2. **Climate Change Mitigation** – designing new communities and buildings to be energy and resource efficient, utilising renewable and low carbon energy generation and promoting patterns of development that reduce the need to travel by less environmentally friendly modes of transport;
- To ensure that the principle of careful and efficient management and use of resources including avoiding, reducing and reusing much of what is now regarded as waste, is inherent in all development proposals;
- To ensure development is safe and is undertaken in areas of least flood risk and ensuring flood risk is not increased elsewhere;
- To ensure that water infrastructure is integrated into the wider network of green, blue and grey infrastructure[14], with a focus on high quality, multi-functional design and its role in place making;
- To recognise the role that an integrated approach to reducing flood risk and improving water body quality has to play in the enhancement of biodiversity and wider amenity of the city.

A holistic approach to sustainable development

6.3 It will be important for all development proposals to be able to clearly demonstrate how they will contribute to delivering the Local Plan's vision. It is increasingly recognised that one of the most important factors in delivering a successful scheme is ensuring that sustainability is a key part of the brief and is therefore integrated from the outset. This almost always leads to a better design and lower overall costs, as options are greater at an early stage and there is more scope to identify options that achieve multiple aims.

6.4 Only one option for policy development has been put forward. This will create a clear framework to enable the principles of sustainability to be

[14] Green infrastructure is a network of multi-functional green space, urban and rural which is capable of delivering a wide range of environmental and quality of life benefits for local communities. Blue infrastructure is similar but is space occupied by water. Grey infrastructure is our existing manmade built environment.

integrated into development proposals. Such an approach would build upon the Council's current sustainability checklist and requirement for the submission of Sustainability Statements, and will help developers to clearly demonstrate how their development meets the 'presumption in favour of sustainable development', which lies at the heart of the NPPF.

Option 42 – Develop a comprehensive sustainable development policy

This option would allow for the development of a sustainable development policy setting out the principles that should be embedded into all development proposals in Cambridge. This could include:

- Design considerations (layout, orientation, scale and massing);
- Transport and accessibility including connectivity with surrounding communities;
- Carbon/greenhouse gas reduction;
- Energy efficiency and the role of renewable/low carbon energy generation;
- Recycling and waste facilities;
- Pollution;
- Protection and enhancement of biodiversity;
- Adaptation to climate change;
- Integrated water management and water conservation;
- Materials and construction waste (resource efficiency);
- Adaptability of buildings, including the re-use of existing buildings; and
- Access to open space including space for urban food production.

By setting out a clear framework with which developers can integrate sustainability concerns into the design of new development, this should help to reduce costs and lead to more successful development proposals.

Questions

6.1 Is there a need for a policy addressing this issue?

6.2 Are there any points which have been missed and you feel should be added (perhaps even an entirely new option?)

6.3 Are there any other reasonable alternatives that should be considered at this stage?

Setting targets for sustainable construction

6.5 Addressing climate change is a key element of sustainable development and it is important that new development proposals can easily demonstrate that they have been designed with our changing climate and enhancement of

environmental performance in mind. Nationally described sustainable construction standards have been developed for both new homes (the Code for Sustainable Homes) and new non-domestic buildings (BREEAM), which could form the basis of new planning policy. The Local Plan should support innovation and investment in sustainable buildings and help to achieve the national timetable for reducing carbon emissions from both new homes and new non-residential buildings. The NPPF is supportive of the use of local planning policies to set requirements for a building's sustainability, as long as this is carried out in a way which is consistent with the Government's zero carbon buildings policy and which utilises nationally described standards.

6.6 The Decarbonising Cambridge Study has assessed the impacts of requiring specific levels of the Code for Sustainable Homes for all new major housing developments in the city. It concludes that it would be feasible for developers to meet Level 4 of the Code for Sustainable Homes to ensure that sustainability is incorporated into all aspects of the design and construction of new homes. It also takes account of levels of sustainability currently being achieved on developments across the city.

6.7 The use of the Code for Sustainable Homes and BREEAM as the basis of policy development utilises nationally described construction standards that will be familiar to the majority of developers. This approach will help to ensure that consideration is given to the wider elements of sustainable development, such as the use of materials with low environmental impact, enhancement of biodiversity and consideration of the impact of building design on the health and wellbeing of building occupants. These are elements that are not covered by Building Regulations but should be integral to a holistic approach to sustainable development, helping to achieve the Plan's vision for a low carbon city.

6.8 The most reasonable option to achieve sustainable development, carbon reduction and high quality design, would be to include a specific policy setting out the standard of development expected in Cambridge. Such an approach would help to take account of local circumstances such as water scarcity and is consistent with the aims of the NPPF for planning to fully support the transition to a low carbon economy.

Option 43 – Sustainable construction standards

This option would allow for the development of a policy requiring a minimum level of the Code for Sustainable Homes (at least Level 4) and BREEAM (either 'very good' or 'excellent'). Consideration could also be given to setting much higher standards for specific scales and types of development. Flexibility could be written into the policy to enable the standards set to rise should more ambitious national standards be adopted in the future through the Government's Zero Carbon Policy.

Such a policy could also set out specific standards in relation to water consumption levels considered under options 52-56 of this chapter.

Questions

6.4 Is there a need for a policy addressing this issue?

6.5 Are there any points which have been missed and you feel should be added (perhaps even an entirely new option)?

6.6 Do you have any views as to whether we should target BREEAM 'very good' or 'excellent' for non-residential development?

6.7 Are there any other reasonable alternatives that should be considered at this stage?

Reduction of carbon emissions from new development

6.9 The achievement of national[15] for the reduction of carbon emissions will require action across all sectors of energy use. Within Cambridge, this will involve balancing the overall increase in emissions due to associated with new development with the opportunities that these developments offer for reducing carbon and greenhouse gas emissions, through measures such as improving energy efficiency and the provision of on-site renewable and low carbon energy generation. Consideration will also need to be given to the role of the Local Plan in supporting improvements to the existing building stock in Cambridge (see Option 50). There are also links with transport, in terms of encouraging the use of more sustainable modes.

6.10 The Decarbonising Cambridge Study considered the impact that setting targets for carbon reduction would have on the viability of new development. Such a policy approach would represent a move away from percentage renewable energy policies such as the Council's existing 10% renewable energy policy. It would take account of the hierarchical approach to reducing carbon emissions through improvements to building fabric and energy efficiency as well as provision of low carbon and renewable energy. It would also provide developers with greater flexibility in how to meet the levels of carbon reduction required. However, it is considered that there may still be merit in including a percentage renewable energy approach, similar to Policy 8/16 in the 2006 Local Plan, which requires 10% renewable energy to form part of the energy strategy for major developments, dependent on the levels of carbon reduction sought in the final plan. Under the Government's initial proposals for zero carbon homes, which required zero regulated and unregulated carbon emissions from new homes, percentage renewable energy policies would arguably have become redundant. However, as part of the budget announcement of 2011, the definition of 'zero carbon' was relaxed to consider regulated emissions only. Added to this the recent consultation on future changes to Building Regulations, which proposed a further relaxation in the levels of carbon reduction required from new homes, there may still be a role for percentage renewable energy policies in the future.

[15] As part of the Climate Change Act (2008) the UK has adopted a national target of reducing carbon emissions by 80% by 2050 with an interim target of a 50% reduction in carbon emissions by 2025

6.11 In light of the above, three options are put forward for possible future policy development, informed by the Council's evidence base. They are considered to be the most reasonable approaches that would help achieve the vision of the Plan for Cambridge to become a low carbon city and to achieve the aims of the NPPF for planning to help secure radical reductions in carbon emissions. There comes a point in levels of carbon reduction where renewable energy provision becomes necessary to meet the required reduction, for example in line with the energy requirements of Level 4 of the Code for Sustainable Homes. However, the recent consultation on proposed changes to Part L of Building Regulations in 2013 recommends a lower level of carbon reduction than originally set out by Government.[16] If this level were adopted nationally as part of Building Regulations, the utilisation of renewable or low carbon energy generation would no longer form a part of a development's carbon reduction strategy. While the hierarchical approach to reducing carbon emissions is fully supported, it is considered that the incorporation of renewable technologies into schemes should still form an important element of carbon reduction strategies in light of concerns surrounding fuel security and national targets for renewable energy generation. The Council's evidence base clearly shows that there are opportunities across the city for planning policy to help secure higher levels of carbon reduction than those being brought forward by changes to Building Regulations.

Option 44 – Detailed targets for on-site carbon emission reductions that relate to levels of the Code for Sustainable Homes being sought.

One option could be to develop a detailed policy requiring specific levels of on-site carbon reduction from all new major development sites in Cambridge. In line with Option 43 for the development of sustainable construction standards, for homes this would equate to a 44% reduction in carbon emissions for all development up to 2016. After 2016, the policy would need to reflect that new homes should be achieving 'zero carbon' status. For non-residential buildings, the timetable for zero carbon non-residential buildings (2019) would be followed.

Such an approach would be unlikely to have a significant impact on the viability of development, as it would be in keeping with the current levels of carbon reduction that will ensure development is on the path of meeting zero carbon policy by 2016 (for new homes) and 2019 (for non residential development). However, this approach would not be fully in keeping with the vision of Cambridge as a low carbon city, and would not take account of the evidence base for climate change, which suggests higher levels of carbon reduction would be viable. It would also fail to meet the NPPF's aims

[16] Communities and Local Government (2006). Building a Greener Future: Towards Zero Carbon Development. This document recommended a 44% reduction (compared to 2006 Building Regulations and equivalent to Level 4 of the Code for Sustainable Homes) in carbon emissions be incorporated into 2013 Building Regulations. This has now been revised down to an approx 33% reduction in carbon emissions utilising energy efficiency and improvements to building fabric.

for planning to help secure radical reductions in carbon emissions.

Option 45 – Detailed targets for on-site carbon emissions reductions in line with the findings of Decarbonising Cambridge

A second option could be to develop a detailed policy requiring specific levels of on-site carbon reduction from all major new residential development that seek to go beyond the levels of carbon reduction that will be brought in through changes to Part L of Building Regulations in 2013 and 2016 and zero carbon homes policy. Evidence contained within the Decarbonising Cambridge Study suggests that a level of carbon reduction in the order of 70% (above 2006 Building Regulations levels) would be a feasible level to set, bearing in mind impacts on viability. This would set a level of carbon reduction higher than the energy requirements of the Code for Sustainable Homes target being considered under Option 43, consistent with the recommendations of the Decarbonising Cambridge Study. Indeed such a target would be greater than the levels of on-site carbon reduction being sought nationally through zero carbon homes policy, which comes into force from 2016.

The pathway for zero carbon non-residential buildings is less well defined. As such, it is suggested that levels of carbon reduction follow planned changes to Building Regulations. Opportunities to go beyond these levels could be pursued for those sites that could connect to infrastructure such as district heating.

While this approach would be in keeping with the vision for a low carbon city, helping to meet the NPPF's aim for planning to secure radical reductions in emissions, there could be a concern from developers of the impact on viability of their proposals.

Option 46 – Leave carbon reduction to Building Regulations and continue to operate a percentage renewable energy policy

A third option could be to leave the setting of carbon reduction for new development to Part L of Building Regulations, but continue to require a percentage of carbon reduction to be brought about specifically through the use of renewable energy. This requirement would be in addition to levels of carbon reduction sought by Building Regulations.

This approach is being considered in light of the recent consultation on changes to the 2013 Part L Building Regulations, which includes an option that would decrease the level of carbon reduction originally intended as part of the transition towards zero carbon policy in 2016.

The advantage of such a policy approach is that it will help to deliver renewables if the level of carbon reduction incorporated into Building

Regulations is reduced. Such an approach is considered as part of the emerging Merton Rule Study[17]. There could be concerns about impact of such a policy on the viability of new development, and this would need to be taken into account.

Questions

6.8 Is there a need for a policy addressing this issue?

6.9 Which of the options do you prefer?

6.10 Are there any points which have been missed and you feel should be added (perhaps even an entirely new option)?

6.11 Are there any other reasonable alternatives that should be considered at this stage?

The role of community energy funds

6.12 Part of the definition of zero carbon development includes the concept that after delivering a certain level of CO_2 reduction on-site, known as carbon compliance, developers can then choose to offset remaining emissions through a range of measures known as 'allowable solutions'. One of these possible measures is that developers would have the choice to pay into a Community Energy Fund, which is then used to invest in energy efficiency and renewable and low carbon energy projects in Cambridgeshire, with an emphasis placed on community benefit. Work is currently underway to investigate the potential of developing a Cambridgeshire Community Energy Fund[18], linked to the national Allowable Solutions Framework[19], which would require the development of a policy mechanism to enable collection of funds. The setting up of such a fund would require agreement across all local authorities in Cambridgeshire, and appropriate governance arrangements would need to be developed.

6.13 Only one option has been put forward for policy development. This option builds upon the Zero Carbon Hub's recommendations to Government concerning the role of local planning authorities in helping to deliver the national zero carbon agenda and the Allowable Solutions Framework. It is also based on the findings of recently completed work that considered the development of a Community Energy Fund for Cambridgeshire. A Local Plan policy would be required to enable the collection of payments into a Community Energy Fund, and as such, it is considered that there are no other reasonable alternatives. Such a policy option would not seek to remove the ability for developers to choose which allowable solution would best deliver their required level of carbon reduction. It would, however, help to direct funding from allowable solutions towards projects with local community

[17] Climate Works Ltd (2012). A review of Merton Rule-style policies in four LPAs in Cambridgeshire
[18] Element Energy (2012). Cambridgeshire Community Energy Fund. Stage 2 Final Report.
[19] Zero Carbon Hub (2011). Allowable Solutions for Tomorrow's New Homes. Towards a Workable Framework

benefits. There has been a lack of progress nationally with the development of the Allowable Solutions Framework, and as such careful consideration will need to be given as to how the development of a policy option related to Community Energy Funds fits with progress with national zero carbon home policy.

Option 47 – Establishment of a Cambridgeshire Community Energy Fund

This option would allow for the development of a policy that would enable the establishment of a Cambridgeshire wide Community Energy Fund. The development of such a policy would provide developers with a route to compliance with zero carbon policy, allowing them to offset any carbon reductions they are unable to achieve on-site through payment into an energy fund. Such a policy would also provide the basis for identifying projects that the fund would invest in.

The advantages of such a policy is that it would assist developers in meeting their zero carbon policy obligations and as such, would not place any additional financial burden on developments. Development of a local list of projects would enable the fund to invest in schemes that would have direct local benefit for Cambridgeshire communities. The Cambridgeshire Community Energy Fund report noted that existing planning mechanisms for the collection of contributions are not ideally suited to the collection of monies into a Community Energy Fund. As such, further work would be required to develop a suitable collection mechanism as part of the development of the national allowable solutions framework.

Questions

6.12 Is there a need for a policy addressing this issue?

6.13 Are there any points which have been missed and you feel should be added (perhaps even an entirely new option)?

6.14 Are there any other reasonable alternatives that should be considered at this stage?

Renewable and low carbon energy development

6.14 As well as national targets for carbon reduction, there are also targets in relation to energy supplied from renewable energy sources, with a requirement for 15%[20] of our energy to be from renewable sources by 2020. The Decarbonising Cambridge Study and Cambridgeshire Renewables Infrastructure Framework[21] have assessed the city's potential for renewable and low carbon energy generation. These studies suggest that the main focus for renewable energy generation will be from the potential the city offers for the development of district heat networks and the utilisation of

[20] The 2009 Renewable Energy Directive [External link] sets a target for the UK to achieve 15% of its energy consumption from renewable sources by 2020. This compares to 3% in 2009.

[21] Camco (2012). Cambridgeshire Renewables Infrastructure Framework – Baseline data, Opportunities and Constraints

microgeneration such as solar panels and heat pumps. While looking to promote renewable and low carbon energy generation, there will also be a need to balance this desire against other objectives for the city such as the protection and enhancement of the historic environment.

6.15 Only one option has been put forward for policy development. Such an approach is consistent with the NPPF's aims for planning to support the delivery of renewable and low carbon energy and to secure radical reductions in greenhouse gas emissions. Such a policy approach builds upon renewable energy capacity research and heat mapping contained within the Decarbonising Cambridge Study and the Cambridgeshire Renewables Infrastructure Framework, focussing on those technologies most suitable for the city. It is also consistent with the legal requirement set out in the Planning Act (2008) for all local plans to contain climate change mitigation measures.

Option 48 – Renewable and Low Carbon Energy Generation

This option would allow for the development a policy to promote the development of renewable and low carbon energy generation within Cambridge, including community energy projects. Such an option could include consideration of the role of new development in supporting/facilitating the development of district heating networks, with the potential to designate areas of the city as strategic district heating areas (e.g. the City Centre).

The advantage of such a policy approach is that it would help to ensure renewable and low carbon energy solutions appropriate to Cambridge. The identification of strategic district heating areas would also help to de-risk proposals for community heat networks, taking a more strategic approach to energy provision. While there may be concern from some as to the effects of such a requirement on the viability of schemes, connection to existing district heating networks represents a cost effective way in which developers can meet their carbon reduction commitments.

Questions

6.15 Is there a need for a policy addressing this issue?

6.16 Are there any points which have been missed and you feel should be added (perhaps even an entirely new option)?

6.17 Are there any other reasonable alternatives that should be considered at this stage?

Climate change adaptation

6.16 Climate change adaptation is a term that describes measures that can be put into place to help new and existing communities adapt to the changes in our climate that are now inevitable. These changes range from increased temperatures and drought conditions, to extreme weather events such as intense periods of rainfall and subsequent flash flooding. It is vital that new

developments are planned with our changing climate in mind, as well as ensuring that they do not exacerbate climate impacts for neighbouring communities.

6.17 Only one option has been put forward for policy development. The Planning Act (2008) places a legal duty on all local planning authorities to include climate change adaptation policies in their local plans. Within this policy option, we would welcome your views on the adaptation measures and criteria put forward.

Option 49 – Climate Change Adaptation

This option would allow for the development of a climate change adaptation policy, setting out a broad range of adaptation criteria for incorporation into all new development proposals. These criteria could include:

- The role of urban form and building orientation in maximising opportunities for natural ventilation strategies, supporting innovation in building design and construction to maximise these opportunities;
- The use of 'cool' building materials to reduce the impacts of higher temperatures;
- The role of water sensitive urban design in reducing flood risk and aiding urban cooling;
- The role of landscaping and features such as green roofs and the enhancement of tree canopy cover in aiding urban cooling and reducing flood risk. Consideration could be given to setting a tree canopy cover requirement for new developments; and
- Protecting, enhancing and expanding green spaces (urban greening) to help cool the city and giving consideration to the role of the River Cam and other water infrastructure in aiding urban cooling.

Developers would be required to include a climate change adaptation strategy as part of the Design and Access Statement.

Such a policy approach would be in keeping with the legal requirement for local planning authorities to develop climate change adaptation policies. The integration of adaptation measures into the design of new development will help to reduce costs and will also increase the long-term sustainability and viability of developments.

Questions

6.18 Is there a need for a policy addressing this issue?

6.19 Are there any points which have been missed and you feel should be added (perhaps an entirely new option)?

6.20 Are there any other reasonable alternatives that should be considered at this stage?

Role of existing buildings

6.18 In order for Cambridge to play a role in meeting national targets for carbon reduction, we have to tackle emissions from existing buildings as well as new. For non-residential buildings, there are many drivers for organisations improving the efficiency of their buildings, such as the Carbon Reduction Commitment, which affects a number of organisations across Cambridge including the University of Cambridge, Colleges and Anglia Ruskin University.

6.19 For houses, the principal mechanism that exists is the consequential improvement element of Part L of Building Regulations. This captures some work undertaken on existing houses by requiring additional measures to improve the energy efficiency of homes to be implemented, for example when looking to build a new extension. However, at present the requirements only apply to dwellings over 1,000m^2, and as such many homes within Cambridge would not need to meet the requirements. Uttlesford District Council operate a similar policy and between 2006 and 2009 it was applied to 1,400 householder applications, with expected carbon savings of around 398,000 Kg CO_2 per year[22]. It should be noted that as part of the recent consultation on changes to Building Regulations[23], the Government has included a proposal to apply the requirements for consequential improvements to all existing domestic buildings which undergo works to add an extension, and also apply it to increases in habitable space (i.e. a loft conversion or conversions of integral garages).

6.20 Only one option has been put forward for policy development. If Cambridge is to play its part in helping to achieve national targets for an 80% reduction in carbon emissions by 2050, action needs to be taken to enhance the energy efficiency not just of new buildings but also existing buildings. The consequential improvements element of Building Regulations provides a well-established national framework within which to develop local planning policy. The focus of such a policy would be on cost effective measures that provide a quick pay back to householders and businesses and aims to ensure that improvements are made in those cases where the current consequential improvements framework would not apply (i.e. dwellings below the 1,000m^2 threshold). The need for such a policy has to be weighed up against the proposed changes to Building Regulations outlined above. We would welcome your thoughts on whether you feel such a policy would still be required if the proposed changes to Building Regulations do go ahead.

Option 50 – Consequential improvements policy

This option would allow for the development of a policy requiring consequential improvements to be made to those homes and non-residential buildings where Part L requirements would not currently apply. Such a policy would apply to planning applications for works such as

[22] Uttlesford District Council Press Release (2010). Uttlesford urges government to rethink energy efficiency

[23] Communities and Local Government (2012). 2012 Consultation on changes to Building Regulations in England. Section two – Part L (Conservation of Fuel and Power)

extensions or loft conversions, and would require the implementation of cost effective measures to improve the energy efficiency of the entire property where such measures had not already been undertaken. Such a policy could be linked to the wider promotion of incentives such as the Green Deal and the Cambridge Retrofit project[24]. There would also be links to options 52-54, which considers the retrofitting of water conservation measures to existing buildings.

The benefits of such a policy approach is that it would help to secure energy efficiency improvements for works to buildings not currently covered by Building Regulations, which would equate to the majority of householder applications in the city. This would help to achieve not only carbon savings but also reduced energy costs for householders and businesses. A focus on cost effective measures would help to reduce viability concerns for applicants. Such a policy would require careful consideration of the appropriate approach to take when dealing with heritage assets, balancing the enhancement of environmental performance and the conservation of heritage assets, with links to Option 70 of the Protecting and Enhancing the Built and Natural Environment chapter of this document.

Questions

6.21 Is there a need for a policy addressing this issue?

6.22 Are there any points which have been missed and you feel should be added (perhaps an entirely new option)?

6.23 Are there any other reasonable alternatives that should be considered at this stage?

Beyond Sustainable Drainage Systems (SuDS) - An integrated approach to water management

6.21 Under 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 a development to deal with the problem of surface water and they do not always fully realise the multifunctional benefits they offer. The key to successful management of surface water within a development is to have it integrated within the development and to think about this at the earliest possible opportunity in the design process.

6.22 Water sensitive design is an approach that considers water as a valuable resource in terms of re-use, visual amenity, biodiversity enhancement and its wider benefits such as providing opportunities for recreation and its role in food production. This approach manages surface water runoff in the most sustainable way, integrating it within the landscape, cleaning the water as it passes through the system and reducing the risk of flooding to the development, adjacent land and land downstream. Water is re-used wherever possible, reducing the burden on drinking water supplies. This is

[24] See http://sites.google.com/site/cambridgeretrofit/

considered the most efficient and cost effective way of managing surface water.

6.23 Surface water management should be integrated into our natural spaces (green infrastructure), existing water bodies (blue infrastructure) and our built environment (grey infrastructure). This increases the efficiency of water management and maximises their multiple benefits.

6.24 Only one option has been put forward for policy development because integrated water management is the most effective way of managing water as described above. This approach is considered best practice and is included within consultation on the draft National SuDS Standards and was endorsed by the Cambridge (and surrounding major growth areas) Water Cycle Strategy Phase 2 (2011).

Option 51 – Develop a comprehensive integrated water management policy

This option would allow for the development of an integrated water management policy setting out the principles that should be embedded into all development proposals in Cambridge. This could include:

- Design considerations (layout, orientation) e.g. the integration of smaller multiple features such as multiple small ponds, swales and basins instead of one large pond;
- Green/blue/grey infrastructure integration so that surface water management is given a priority above other uses. For example green open spaces with the ability to temporarily store water (say once every 100 years) should be a priority;
- Consideration of how the water management features will look, ensuring that they are of high quality design and relate to their surroundings;
- How the water management features could promote biodiversity;
- How ecosystem services are considered before any other method;
- How water management should make the most use of multi-functional spaces;
- A minimum of 10-15% of the development area set aside as open space used for multi-functional surface water management[25];
- Adopt local Sustainable Drainage Standards e.g. those that are being produced by Cambridgeshire County Council and;
- Ensure adequate water services provisions.

The advantage of such a policy approach is that it would ensure that water management proposals form an integrated element of the overall design of development proposals. This will in turn lead to water management

[25] Cambridge Sub-Region Water Cycle Strategies 2008 and 2010

solutions that offer multiple benefits beyond just reduction of flood risk, including the enhancement of biodiversity and mitigation of the urban heat island effect. There may be a concern from developers that such an approach will lead to increased costs, but costs should be reduced by considering options from the outset.

Questions

6.24 Is there a need for a policy addressing this issue?

6.25 Are there any points which have been missed and you feel should be added (perhaps even an entirely new option?)

6.26 Are there any other reasonable alternatives that should be considered at this stage?

Water efficiency in residential development

6.25 Cambridge is an area of severe water stress. Water supplies are finite and abstraction can have a negative effect on the environment. Cambridge Water Company's Water Resources Management Plan (2010) contains simplistic but compelling evidence that beyond 2035, without the development of additional resources, the supply of water to new developments will exceed the available output. The introduction of greater water efficiency in new and existing dwellings will extend this horizon. The long term (100 years) availability of water for future growth is dependent on greater water efficiency in developments.

6.26 Water neutrality is where a new development does not consume any additional water than prior to when it was constructed. This is achieved by on-site water efficiency and re-use together with an off-site increase in water efficiency that matches the water consumption levels of the development.

6.27 In order to achieve water neutrality, the following measures would be necessary:

- Water re-use by rainwater harvesting and grey water recycling. District wide systems can offer a more cost effective way of providing this;
- The possible creation of a water offsetting fund to enable development to be water neutral to provide water efficiency measures in the existing built environment.

6.28 Three options have been included as there is a cost associated with achieving greater levels of water efficiency. The options specify the level of water efficiency to be achieved, and it would be up to developers to choose the suitable methods by which they achieve this. These options are considered to be the most reasonable approaches to take.

Option 52 – Water Efficiency – Water Neutrality

One option could be to require that all developments be water neutral. Water efficiency measures would also be required in extensions and refurbishments to achieve this level.

The advantages of this option would be that it is equivalent to not building at all and it would address water efficiency in the existing built environment. The disadvantages would be that it would be the most expensive option – approximately £320 per property[26] more expensive than the option of restricting usage to 80 litres per head per day. There would also be the inherent difficulties of applying retrofit measures to existing properties and ongoing maintenance costs.

Option 53 – Water Efficiency – 80 litres per head per day

A second option would be to require that all new developments be designed to achieve a maximum water consumption of 80 litres per head per day in line with Code for Sustainable Homes level 5 or 6. Water efficiency measures would also be required in extensions and refurbishments.

This is achievable with current technology but there would be an increase in cost of the water supply infrastructure to achieve this level.

The advantage of such a policy option would be that there would be greater water efficiency than is currently normally provided in domestic dwellings.

A disadvantage would be that the cost is approximately £1,750 to £4,500 per property[27], although this is considerably reduced by the use of district wide systems. There would still be an increase in the amount of water being used in Cambridge each year. The ongoing maintenance costs would also need to be factored in.

Option 54 – Water Efficiency – 105 litres per head per day

A third option would be to require that all new developments be designed to achieve a maximum water consumption of 105 litres per head per day in line with Code for Sustainable Homes level 3 or 4. Water efficiency measures would also be required in extensions and refurbishments to achieve this level.

An advantage of this option would be the minimal cost (£268 per property[28]) in achieving a greater level of water efficiency. A disadvantage would be that there is still an increase in the amount of water being used in Cambridge each year, and more cost effective opportunities to reduce water consumption would be missed. Retrofitting the existing housing stock, while an important element, is more costly than integrating water efficiency into

[26] Cambridge Sub-Region Water Cycle Strategies 2008 and 2010
[27] Cambridge Sub-Region Water Cycle Strategies 2008 and 2010
[28] Cambridge Sub-Region Water Cycle Strategies 2008 and 2010

new development.

Questions

6.27 Is there a need for a policy addressing this issue?

6.28 Which of the options do you prefer?

6.29 Are there any points which have been missed and you feel should be added (perhaps even an entirely new option?)

6.30 Are there any other reasonable alternatives that should be considered at this stage?

Water consumption in non-residential buildings

6.29 Buildings other that domestic properties such as offices, shops, schools and industrial buildings can consume large amounts of water. These buildings are used and assessed in a different way so a separate policy might be appropriate. Two possible water efficiency options for this policy are considered below.

Option 55 – Water Efficiency – non-domestic buildings

One option could be to require that all non-domestic developments be designed to achieve the highest water efficiency levels practicable.

This option could include an assessment undertaken utilising the BREEAM method and achieving the highest points available for all of the water criteria.
The advantages of such a policy approach are that the highest levels of water efficiency for non-domestic buildings would be achieved with water consumption reductions of up to 65%. However, there would be an additional cost associated with achieving the highest level of water efficiency.

Option 56 – Water Efficiency – non-domestic buildings

A second option could be to require that all non-domestic developments be designed to achieve high water efficiency standards. This option could include an assessment undertaken utilising the BREEAM method and achieving a minimum BREEAM rating of 'very good' to 'excellent'.

The advantages of such a policy approach would be that minimal cost is associated with this option. However, water consumption reductions could be as low as 12.5% and still achieve a BREEAM rating of 'very good' or 'excellent'.

Questions

6.31 Is there a need for a policy addressing this issue?

6.32 Which Option do you prefer?

6.33 Should water efficiency in non-domestic buildings be assessed by the BREEAM method or is there a more appropriate assessment?

6.34 Are there any points which have been missed and you feel should be added (perhaps even an entirely new option?)

6.35 Are there any other reasonable alternatives that should be considered at this stage?

Flood Risk

6.30 Cambridge has issues with surface water (pluvial) and river (fluvial) flood risk throughout the city. The Surface Water Management Plan for Cambridge (2011) shows that the majority of the city is at high risk of surface water flooding. Development, if not undertaken with due consideration of the risk to the development and the existing built environment, will further increase the flood risk.

6.31 Cambridge and South Cambridgeshire Level 1 Strategic Flood Risk Assessment (2010) shows that there are areas adjacent to the River Cam and smaller watercourses that are at varying degrees of flood risk. Development in high risk areas should be avoided and steered to lower risk areas. As all surface water drains into the watercourses and the River Cam, due consideration must be given to the impact of any new development in Cambridge upon the consequential increase in flood risk downstream.

6.32 Only one option has been put forward for policy development because the Council has a statutory duty to manage flood risk under the Flood and Water Management Act 2010.

Option 57 – Develop a comprehensive flood risk reduction policy

This option would allow for the development of a flood risk reduction policy. Such a policy would set out the principles of flood risk management that should be embedded into all development proposals in Cambridge. These could include:

- Design considerations (layout, orientation) e.g. the most vulnerable parts of the development being constructed in the area of least flood risk on the site;
- Areas to avoid including fluvial risk areas and pluvial risk areas for new developments and re-developments, where practicable;
- The management of flow routes that result from surface water flooding;
- Flood resistance (preventing water from entering a property) and reliance (making a property less prone to permanent damage when flooded) measures to be included in defined areas;
- Discharge of surface water limited to 2 litres per second per hectare

(l/s/ha) for all developments; and

- Surface water discharge on previously developed sites should be limited to 2 l/s/ha to limit the amount of water entering water courses thereby providing a positive flood risk reduction.

Questions

6.36 Is there a need for a policy addressing this issue?

6.37 Are there any points which have been missed and you feel should be added (perhaps even an entirely new option?)

6.38 Are there any other reasonable alternatives that should be considered at this stage?

Enhancing the quality of water bodies

6.33 The Council has a duty to ensure that there is improvement to water body quality through its policies and actions. When considered in the context of the Anglian River Basin Management Plan (2009) and the Water Framework Directive (2000), the status of the water body quality in Cambridge currently varies from poor to moderate across a number of water bodies including the River Cam, Bin Brook, Cherry Hinton Brook, Hobson's Brook and groundwater supplies including the Cam and Ely Ouse Chalk. The city's water bodies have not achieved 'good' status as a result of canalisation, with a loss of their natural characteristics, and the flow of untreated surface water runoff into the watercourses and the River Cam.

6.34 Only one option has been put forward for policy development because the Council has a statutory duty to have regard to the Water Framework Directive and the associated Anglian River Basin Management Plan.

Option 58 – Develop a water body quality policy

This option would allow for the development of a water body quality policy setting out the principles that should be embedded into all development proposals in Cambridge. This could include:

- Design considerations (layout, orientation) e.g. careful consideration of development in close proximity to water bodies and a requirement for a positive improvement to those water bodies (both in terms of water quality and ecology of those water bodies);
- Minimum water quality criteria that is allowable to be discharged into water bodies;
- Development taking the opportunity to remove culverts from water bodies to restore them to their natural state; and
- Waterside development contributing to wider improvements to the hydromorphology and ecology of the water body.

The City Council has a duty to ensure that there is improvement to water

body quality through its policies and actions. Such a policy will ensure that we meet our statutory legal duty set out as part of the Water Framework Directive.

Questions

6.39 Is there a need for a policy addressing this issue?

6.40 Are there any points which have been missed and you feel should be added (perhaps even an entirely new option?)

6.41 Are there any other reasonable alternatives that should be considered at this stage?

Green Roofs

6.35 Green roofs offer multiple benefits in terms of surface water management, amenity, biodiversity, water quality improvements, carbon reduction, noise attenuation, and reduction of the urban heat island effect, and they can be more cost effective than conventional roofs[29].

6.36 Only one option has been put forward for policy development because green roofs will help to deliver climate change adaptation, enhancement of the natural environment and landscape, and to not include such an option would not be a reasonable alternative. However, different potential approaches to dealing with green roofs have been set out and we would welcome comments on these alternatives:

Option 59 – Develop a green roof policy

This option would allow for the development of a green roof policy setting out the principles that should be embedded into all development proposals in Cambridge. This could include:

- Green roofs required on all buildings;
- Green roofs on all roofs below 35 degrees;
- Intensive green roofs[30] on all roofs of an area between 5 – 30 square metres;
- Extensive green roofs[31] on all roofs of an area over 30 square metres; and
- A minimum percentage of the footprint of a building to be a green roof.

Such a policy would require careful consideration of the appropriateness of green roofs when dealing with heritage assets, balancing the benefits of

[29] Living roofs and walls, technical report: supporting London Plan Policy – GLA 2008

[30] Intensive green roofs are those made up of lush vegetation and based on a relatively nutrient rich deep substrate. They are principally designed to provide amenity.

[31] Extensive green roofs normally have a shallow growing medium and are design to be relatively self-sustaining.

green roofs and the protection of heritage assets. This policy option would need to link with Option 70 of the Protecting and Enhancing the Built and Natural Environment chapter of this document.

The advantages of such a policy is that the use of green roofs would help to achieve a number of the Local Plan's objectives, including the reduction of flood risk, enhancement of biodiversity and wider climate change adaptation benefits. While there may be a concern surrounding the additional costs of providing green roofs, they can prove to be more cost effective than conventional roofs both in the short and long term.

Questions

6.42 Is there a need for a policy addressing this issue?

6.43 Are there any points which have been missed and you feel should be added (perhaps even an entirely new option?)

6.44 Do you agree with the thresholds for green roofs presented in the second, third and fourth bullet points of Option 59 or do you feel alternative thresholds should be use?

6.45 Should buildings that are allowable under permitted development rights (such as small extensions, sheds and workshops) also have green roofs?

6.46 Are there any other reasonable alternatives that should be considered at this stage?