7 Climate Change Adaptation and Mitigation

Policy Context

International

7.1 **European Floods Directive** (2007): A framework for the assessment and management of flood risk, aiming at the reduction of the adverse consequences for human health, the environment, cultural heritage and economic activity.

7.2 **European Energy Performance of Buildings Directive** (2010): Aims to promote the energy performance of buildings and building units. Requires the adoption of a standard methodology for calculating energy performance and minimum requirements for energy performance.

7.3 **United Nations Paris Climate Change Agreement** (2015): International agreement to keep global temperature rise this century well below 2 degrees Celsius above pre-industrial levels.

National

7.4 National Planning Policy Framework (NPPF)[187]: Contains the following:

- One of the core planning principles is to "support the transition to a low carbon future in a changing climate, taking full account of flood risk and coastal change. It should help to: shape places in ways that contribute to radical reductions in greenhouse gas emissions, minimise vulnerability and improve resilience; encourage the reuse of existing resources, including the conversion of existing buildings; and support renewable and low carbon energy and associated infrastructure".
- Inappropriate development in areas at risk of flooding should be avoided. Where development is necessary, it should be made safe for its lifetime without increasing flood risk elsewhere.
- Local planning authorities should adopt a proactive approach to mitigate and adapt to climate change, taking full account of flood risk, coastal change, water supply, biodiversity and landscapes, and the risk of overheating from rising temperatures.

7.5 **National Planning Practice Guidance (PPG)**[188]: Supports the content of the NPPF by promoting low carbon and renewable energy generation, including decentralised

[187] Department for Communities and Local Government (2019) National Planning Policy Framework [online] Available at: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/779764/NPPF_Feb_2019_web.pdf

[188] Department for Communities and Local Government (2016) National Planning Practice Guidance [online] Available at: https://www.gov.uk/government/collections/planning-practice-guidance

energy, the energy efficiency of existing and new buildings and sustainable transport.

7.6 **Planning Act (2008)**[189]**:** Section 182 places a legal duty on local planning authorities to ensure that their development plan documents include policies to ensure that development and use of land in their area contributes to the mitigation of, and adaptation to, climate change.

7.7 **Planning and Energy Act (2008)**[190]: enables local planning authorities to set requirements for carbon reduction and renewable energy provision. It should be noted that while the Housing Standards Review proposed to repeal some of these provisions, at the time of writing there have been no amendments to the Planning and Energy Act.

7.8 **Climate Change Act 2008**[191]: Sets targets for UK greenhouse gas emission reductions of at least 100% by 2050 and CO_2 emission reductions of at least 26% by 2015, against a 1990 baseline (in 2008 the target was set at 80%, however the target has recently been amended in 2019 by Statutory Instrument No.1056 to 100%).

7.9 **Flood and Water Management Act (2010)**[192]: Sets out measures to ensure that risk from all sources of flooding is managed more effectively. This includes: incorporating greater resilience measures into the design of new buildings; utilising the environment in order to reduce flooding; identifying areas suitable for inundation and water storage to reduce the risk of flooding elsewhere; rolling back development in coastal areas to avoid damage from flooding or coastal erosion; and creating sustainable drainage systems (SuDS).

7.10 **The UK Renewable Energy Strategy**[193]: Sets out the ways in which we will tackle climate change by reducing our CO_2 emissions through the generation of a renewable electricity, heat and transport technologies.

7.11 **The Energy Efficiency Strategy: The Energy Efficiency Opportunity in the UK**[194]: Aims to realise the wider energy efficiency potential that is available in the UK economy by maximising the potential of existing dwellings by implementing 21st century energy management initiatives on 19th century homes.

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[189] HM Government (2008) Planning Act 2008 [online] Available at: http://www.legislation.gov.uk/ukpga/2008/29/contents

[190] HM Government (2008) Planning and Energy Act 2008 [online] Available at: https://www.legislation.gov.uk/ukpga/2008/21

[191] HM Government (2008) Climate Change Act 2008 [online] Available at: https://www.legislation.gov.uk/ukpga/2008/27/pdfs/ukpga_20080027_en.pdf

[192] HM Government (2010) Flood and Water Management Act 2010 [online] Available at: http://www.legislation.gov.uk/ukpga/2010/29/pdfs/ukpga_20100029_en.pdf

[193] HM Government (2009) The UK Renewable Energy Strategy [online] Available at: https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/228866/7686.pdf

[194] Department of Energy & Climate Change (2012) The Energy Efficiency Strategy: The Energy Efficiency Opportunity in the UK [online] Available at: https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/65602/6927-energy-efficiency-strategy--the-energy-efficiency.pdf

7.12 The National Adaptation Programme and the Third Strategy for Climate Adaptation Reporting: Making the country resilient to a changing climate[195]: Sets out visions for the following sectors:

- People and the Built Environment – "to promote the development of a healthy, equitable and resilient population, well placed to reduce the harmful health impacts of climate change...buildings and places (including built heritage) and the people who live and work in them are resilient and organisations in the built environment sector have an increased capacity to address the risks and make the most of the opportunities of a changing climate."
- Infrastructure – "an infrastructure network that is resilient to today's natural hazards and prepared for the future changing climate".
- Natural Environment – "the natural environment, with diverse and healthy ecosystems, is resilient to climate change, able to accommodate change and valued for the adaptation services it provides."
- Business and Industry – "UK businesses are resilient to extreme weather and prepared for future risks and opportunities from climate change."
- Local Government – "Local government plays a central role in leading and supporting local places to become more resilient to a range of future risks and to be prepared for the opportunities from a changing climate."

7.13 **UK Climate Change Risk Assessment 2017**[196]**:** Sets out six priority areas needing urgent further action over the next five years in order to minimise risk from the effects of climate change. These priority areas include: flooding and coastal change risk to communities, businesses and infrastructure; risks to health, wellbeing and productivity from high temperatures; risk of shortages in the public water supply and for agriculture, energy generation and industry; risks to natural capital; risks to domestic and international food production and trade; and new and emerging pests and diseases and invasive species.

7.14 Understanding the risks, empowering communities, building resilience: The national flood and coastal erosion risk management strategy for England[197]: This Strategy sets out the national framework for managing the risk of flooding and coastal erosion. It sets out the roles for risk management authorities and communities to

[195] HM Government (2018) The National Adaptation Programme and the Third Strategy for Climate Adaptation Reporting: Making the country resilient to a changing climate [online] Available at: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/727252/national-adaptation-programme-2018.pdf

[196] HM Government (2017) UK Climate Change Risk Assessment [online] Available at: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/584281/uk-climate-change-risk-assess-2017.pdf

[197] HM Government (2011) Understanding the risks, empowering communities, building resilience: The national flood and coastal erosion risk management strategy for England [online] Available at: https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/228898/9780108510366.pdf

help them understand their responsibilities. The strategic aims and objectives of the Strategy are to:

- Manage the risk to people and their property.
- Facilitate decision-making and action at the appropriate level – individual, community or local authority, river catchment, coastal cell or national.
- Achieve environmental, social and economic benefits, consistent with the principles of sustainable development.

7.15 **A Green Future: Our 25 Year Plan to Improve the Environment**[198]: Sets out goals for improving the environment within the next 25 years. It details how the Government will work with communities and businesses to leave the environment in a better state than it is presently. Identifies six key areas around which action will be focused. Those of relevance to this chapter are: using and managing land sustainably; and protecting and improving our global environment. Actions that will be taken as part of these two key areas are as follows:

- Using and managing land sustainably:
  - Take action to reduce the risk of harm from flooding and coastal erosion including greater use of natural flood management solutions.
- Protecting and improving our global environment:
  - Provide international leadership and lead by example in tackling climate change and protecting and improving international biodiversity.

Sub-national

7.16 **Cambridgeshire Green Infrastructure Strategy (2011)**: Mitigating and adapting to climate change is one of the four objectives of the Strategy. It notes the low-lying nature of the county and subsequent flood risk, as well as the prospect that growth and development will further exacerbate the human and economic impacts.

7.17 **Cambridgeshire Renewables Infrastructure Framework (2012)**[199]**:** Identifies a wide range of renewable technologies available, creating opportunities for Cambridgeshire to be a leading county for clean energy projects, goods and services, recognising that the Cambridge area has an excellent research base for renewable energy technologies and is an ideal location in the UK for growth in the sector. The Framework identifies that 9% of the opportunity is in Cambridge City and 26% in South Cambridgeshire. A separate report setting out the baseline data[200] notes that South Cambridgeshire (along with Huntingdonshire) has both the greatest renewable energy potential and the greatest energy demand.

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[198] HM Government (2018) A Green Future: Our 23 Year Plan to Improve the Environment [online] Available at: https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/673203/25-year-environment-plan.pdf

[199] Cambridgeshire Horizons (2012) Cambridgeshire Renewables Infrastructure Framework (CRIF) – Final Report [Online] Available at: https://files.cambridge.gov.uk/public/ldf/coredocs/rd-cc-040.pdf

[200] Cambridgeshire Horizons (2012) Cambridgeshire Renewables Infrastructure Framework (CRIF) – Baseline data, opportunities and constraints [Online] Available at:

7.18 **Cambridge Sustainable Design and Construction SPD (2007)**[201]**:** Produced to provide guidance on the policies within the Cambridge Local Plan 2006 that relate to sustainability. An emerging SPD for Greater Cambridge is currently in consultation and will replace the existing SPD when adopted.

7.19 **South Cambridgeshire Design Guide SPD (2010)**[202]**:** Produced to expand on district-wide policies and ensure that design is an integral part of the development process, in a way that respects the local context. An emerging SPD for Greater Cambridge is currently in consultation and will replace the existing SPD when adopted.

7.20 **Scoping Report: Feasibility of a Carbon Offset Mechanism for Cambridgeshire (2010)**[203]**:** Explores the role that a Carbon Offset Fund (COF) could play in delivering low carbon growth within Cambridgeshire, as an alternative to developer meeting their whole carbon reduction obligations through on-site measures, with a focus on large-scale projects.

7.21 **Cambridgeshire Community Energy Fund Final Report (2012)**[204]**:** Presents a study of the role that a community energy fund (CEF) – one that levies a charge on developers for the emissions resulting from new development and pool these into a fund for carbon saving projects - might play in delivering carbon emissions reduction in Cambridgeshire.

7.22 **Cambridge Climate Change Strategy 2016-2021:** Sets out five key objectives for how Cambridge City will address the causes and consequences of climate change, focussing on areas that contribute most to the City's carbon footprint and where the Council has the most scope to influence emissions, including: reducing emissions from the estate and operations; reducing transport emissions; promoting energy efficiency in development and through behaviour change; reducing consumption and waste; and supporting efforts to adapt to climate change impact.[205] An update report in October 2018[206] sets out progress to date on each objective.

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http://scambs.moderngov.co.uk/documents/s61865/Cambridgeshire%20Renewables%20Infrastructure%20Framework%20-%20Baseline%20Data%20Opportunities%20and%20Constraints.pdf

[201] Cambridge City Council (2007) Sustainable Design and Construction SPD [online] Available at: https://www.cambridge.gov.uk/media/2355/sustaincomspd_web.pdf

[202] South Cambridgeshire District Council (2010) District Design Guide [online] Available at: https://www.scambs.gov.uk/planning/local-plan-and-neighbourhood-planning/district-design-guide-spd/

[203] Cambridgeshire Horizons (2010) Scoping Report: Feasibility of a Carbon Offset Mechanism for Cambridgeshire [Online] Available at: https://files.cambridge.gov.uk/public/ldf/coredocs/Stage%201%20Carbon%20Offset%20Report.pdf

[204] Cambridgeshire Horizons (2012) Cambridgeshire Community Energy Fund [Online] Available at: https://files.cambridge.gov.uk/public/ldf/coredocs/Stage%202%20Community%20Energy%20Fund%20Report.pdf

[205] Cambridge City Council (2016) Climate Change Strategy 2016-2021 [Online] Available at: https://www.cambridge.gov.uk/media/3230/climate_change_strategy_2016-21.pdf

[206] Cambridge City Council (2018) Annual Climate Change Strategy, Carbon Management Plan and Climate Change Fund Update Report [Online] Available at:

7.23 **Cambridge Climate Change Adaptation Plan**[207]**:** This plan was developed as part of one of the actions identified in the Council's Climate Change Strategy. It aims to improve the resilience of the Council and city to extreme weather events through multiple actions outlined in the plan.

7.24 **Decarbonising Cambridge Study (2010)**[208]**:** Provides the evidence base for setting targets for the CO_2 performance of new developments in Cambridge. Assesses the potential for low carbon and renewable energy systems and provides advice on the development of planning policy and identifying supportive measures to achieve policy goals. An update to this work looking at the role of planning in delivering net zero is to be commissioned.

7.25 **Cambridgeshire Flood and Water SPD (2016)**[209]**:** Provides guidance for developers on how to manage flood risk and the water environment as part of new development proposals. This includes how to incorporate sustainable drainage systems and how to take account of climate change.

7.26 **Cambridge & South Cambridgeshire Level 1 SFRA (2010)**[210]**:** Assesses the extent and nature of the risk of flooding in the area and its implications for land use planning. It finds that most of the internal drainage boards within the study area is found in the north of South Cambridgeshire, and that fluvial flooding is the dominant source of flood risk, with surface water also likely to be a key issue. An updated SFRA is currently being commissioned.

7.27 **Cambridgeshire Surface Water Management Plan (2014)**[211]**:** Recognises that surface water flooding can put more properties at risk than fluvial flooding and can be more difficult to predict that river or coastal flooding. It collates and reviews flood incident records and produces a revised list of 'wetspot' prioritisation to assist in allocating resources.

7.28 **Histon and Impington Surface Water Management Plan (2014)**[212]**:** Investigates surface water flooding issues and the feasibility of potential mitigation solutions in

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https://www.cambridge.gov.uk/media/6891/climate-change-strategy-progress-report-2017-18.pdf

[207] Cambridge City Council (2018) Climate Change Adaptation Plan [online] Available at: https://www.cambridge.gov.uk/media/5996/climate-change-adaptation-plan.pdf

[208] Element Energy for Cambridge City Council (2010) Cambridge: A renewable and low carbon energy study [Online] Available at: https://www.cambridge.gov.uk/media/2529/rd-cc-250.pdf

[209] Cambridgeshire County Council (2016) Cambridgeshire Flood and Water SPD [Online] Available at: https://www.cambridge.gov.uk/media/7107/cambridgeshire-flood-and-water-spd.pdf

[210] Cambridge City Council and South Cambridgeshire District Council (2010) Cambridge & South Cambridgeshire SFRA [Online]. Available at: https://www.cambridge.gov.uk/media/2560/ccc_sfra_report_text.pdf

[211] Cambridgeshire County Council (2014) Surface Water Management Plan – Countywide Update [Online] Available at: https://ccc-live.storage.googleapis.com/upload/www.cambridgeshire.gov.uk/business/planning-and-development/Cambs_Surface_Water_Management_Plans_aug15.pdf?inline=true

[212] Cambridgeshire County Council (2014) Surface Water Management Plan – Histon & Impington Pre-PAR [Online]. Available at: https://ccc-

Histon & Impington villages, located to the north of Cambridge. It focuses on three earlier identified 'wetspots' based on historic flooding evidence and mapping.[213]

7.29 **Cambridge Area Water Cycle Strategy - Phase 1 (2008)[214] and Phase 2 (2011)[215]:** Provides an evidence base concerning the required water services infrastructure for planned development in the Cambridge Sub-Region (CSR). The Phase 1 study identified no insurmountable technical constraints to the proposed level of growth, but identified a number of important issues including the need for a Surface Water Management Plan, a detailed analysis of increased flood risk at the Swavesy Drain, and the need to investigate the viability of achieving 'water neutrality'[216]. Phase 2 goes further and supports a more aspirational vision for water management, including aspirations to water neutrality, improving biodiversity and sustainable surface water management. In addition, a further dedicated Water Cycle Strategy (WCS) was developed in 2014 for the allocated strategic development site at Denny St Francis, north of the existing town of Waterbeach.[217] An update to this strategy is being commissioned by the Councils, which will form part of an Integrated Water Management Study.

7.30 **Cambridge and Milton Surface Water Management Plan (2011)[218]:** Aims to produce a long term surface water management Action Plan for Cambridge and Milton, to be reviewed every 6 years at a minimum. The study notes increasing flood risk associated with climate change as a critical factor.

7.31 **Great Ouse Catchment Flood Management Plan (2011)[219]:** Sets out the scale and extent of flooding now and in the future, and policies for managing flood risk within the catchment.

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live.storage.googleapis.com/upload/www.cambridgeshire.gov.uk/business/planning-and-development/Histon_and_Impington_SWMP_report.pdf?inline=true

[213] 1) Villa Road/South Road; 2) Glebe Road; Water Lane.

[214] Cambridgeshire Horizons (2008) Water Cycle Strategy up to 2031, Major Growth Areas in and around Cambridge, Phase 1 – Outline Strategy [Online]. Available at: https://www.scambs.gov.uk/media/7595/cambridgeshire-water-cycle-strategy-phase-1-2008.pdf

[215] Cambridgeshire Horizons (2011) Detailed Water Cycle Strategy up to 2031, Major Growth Areas in and around Cambridge, Phase 2 – Detailed Strategy [Online]. Available at: https://www.scambs.gov.uk/media/7596/cambridgeshire-water-cycle-strategy-phase-2-2011.pdf

[216] The concept that the total water used after a new development is no more than the total water used before the development in a given wider area. This requires meeting the new demand through improving the efficiency of use of the existing water resources.

[217] RLW Estates (2014) Denny St Francis Water Cycle Study [Online]. Available at: https://www.scambs.gov.uk/media/1380/328331_denny_st_francis_water_cycle_study_-_detailed_report_revd.pdf

[218] Cambridgeshire Flood Risk Management Partnership (2011) Cambridge and Milton Surface Water Management Plan [online] Available at: https://ccc-live.storage.googleapis.com/upload/www.cambridgeshire.gov.uk/business/planning-and-development/Cambridge_And_Milton_SWMP_report.pdf?inline=true

[219] Environment Agency (2011) Great Ouse Catchment Flood Management Plan [online] Available at: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/288877/Great_Ouse_Catchment_Flood_Management_Plan.pdf

7.32 **Citywide Tree Strategy 2016-2026**[220]**:** Aims to sustainable manage the Council's own trees and those it manages by agreement, to foster a resilient tree population that responds to the impacts of climate change and urban expansion, to raise awareness of trees being a vital community asset, through promoting continued research, through education via the provision of advice and through partnership working and to make efficient and strategic use of the Council's regulatory powers for the protection of trees of current and future value.

Current Baseline

7.33 Following a Council meeting on 29 November 2018, South Cambridgeshire District Council pledged to support a target of cutting local carbon emissions to zero by 2050, which was before the Government adopted net zero by 2050 as a national target in 2019.[221]

7.34 On 21 February 2019 Cambridge City Council declared a 'climate emergency', following the submission of a petition signed by over 2,000 local residents. The Council also agreed on the same date to establish a Cambridge Climate Charter, which will call on all organisations, businesses and individuals in the city to each establish their own carbon reduction plans to work toward achieving the city's net carbon-zero aspiration.[222] This will be supported by a Climate Change / Net Zero Carbon Study being commissioned by the Councils.

Climate change mitigation

7.35 Between 2005 and 2016 in South Cambridgeshire, per capita carbon emissions fell from 13.3 tonnes to 8. In Cambridge City per capita emissions are lower and fell from 6.7 to 4.5 tonnes over the same period. As of 2016 the average for Cambridgeshire County was 7.2 tonnes per capita, and the national average was 8.7, suggesting that Cambridge City is outperforming the national and regional averages, while the carbon emissions of South Cambridgeshire lie between the county and national averages.[223]

7.36 As illustrated in **Table 7.1,** both South Cambridgeshire and Cambridge City achieved similar overall reductions in carbon emissions between 2005 and 2016 (31% and 29% respectively). In both cases, but particularly for South Cambridgeshire, these reductions were due mostly to progress in reducing emissions from industrial and commercial sectors, with minimal progress on transport emissions. Transport now makes the largest contribution to carbon

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[220] Cambridge City Council (2016) Citywide Tree Strategy 2016-2026 [online] Available at: https://www.cambridge.gov.uk/media/3260/tree-strategy-2016-part-1.pdf

[221] South Cambridgeshire District Council (29 November 2018) Agenda, decisions and minutes [Online]. Available at: https://scambs.moderngov.co.uk/ieListDocuments.aspx?CId=410&MId=7252

[222] Cambridge City Council (22 February 2019) Cambridge City Council declares climate emergency [Online] Available at: https://www.cambridge.gov.uk/news/2019/02/22/cambridge-city-council-declares-climate-emergency

[223] UK Local Authority and Regional Carbon Dioxide Emissions National Statistics: 2005-2016 Available at: https://www.gov.uk/government/statistics/uk-local-authority-and-regional-carbon-dioxide-emissions-national-statistics-2005-2016

emissions (over 34 percent) in South Cambridgeshire, however in Cambridge City the industrial and commercial sectors still make the biggest contribution (almost 50%).

7.37 Protection and enhancement of the lowland peat resource is critical to mitigating and adapting to climate change given its significant role in carbon sequestration, flood storage/management and maintaining water quality. The Cambridgeshire Fens include a significant proportion of the East Anglian Fen peat and pilot projects by Defra, including the East Anglian Fens Peat Pilot, will work with internal drainage boards to look at water flows on and around the fens. It will also bring in long-term sustainability of peat management opportunities and creation of the Lowland Agricultural Peat Taskforce.

Table 7.1 Carbon dioxide emissions in Greater Cambridge (shown as kilo tonnes)[224]

Year	Industrial and Commercial	Domestic	Transport	Total
South Cambridgeshire				
2005	823.4	355.7	630.8	1,821.0
2016	360.2	257.4	628.5	1,248.7
% of total	29%	21%	50%	
Change 2005-	-56%	-28%	-<1%	-31%
Cambridge City				
2005	423.1	242.7	116.4	781.8
2016	273.8	173.3	109.6	556.0
% of total	49%	31%	20%	
Change 2005-	-35%	-29%	-6%	-29%

7.38 The Cambridgeshire Renewables Infrastructure Framework (CRIF) notes that in order to meet carbon reduction objectives across the county, both energy efficiency and renewable energy are needed. The Cambridge Local Plan and associated Greater Cambridge Sustainable Design and Construction SPD[225] provides guidance on implementing sustainable design policies in the Cambridge Local Plan (2018) and the South Cambridgeshire Local Plan (2018). In particular, the SPD sets out guidance that seeks to ensure developments are built to high sustainability standards and are adaptable to future climate change. In terms of carbon emissions, it sets a standard of a 19% improvement in the Dwelling Emission Rate/Target Emission Rate over Part L 2013, presented through a carbon reduction report. In South Cambridgeshire, planning policy requires new developments to use on-site renewable and/or low carbon energy to reduce carbon emissions associated with Regulated Energy use by 10%.

[224] UK Local Authority and Regional Carbon Dioxide Emissions National Statistics: 2005-2016 Available at: https://www.gov.uk/government/statistics/uk-local-authority-and-regional-carbon-dioxide-emissions-national-statistics-2005-2016

[225] Greater Cambridge Draft Sustainable Design and Construction SPD [Online] Available at https://www.cambridge.gov.uk/consultations/draft-sustainable-design-and-construction-spd-consultation

7.39 As far as energy generation is concerned, the CRIF notes that the county already has the greatest installed renewable energy capacity in the East of England and one of the highest outputs of any county in England, however there is room for greater deployment to meet the full demand and using a range of technologies. This would require a substantial amount of new infrastructure. The Framework highlights that South Cambridgeshire has high potential for renewable energy technology, and that Cambridge lacks wind resources but has substantial potential for air source heat pumps and PV, although the high density and number of conservation areas limits the potential for building integrated technologies.[226]

Climate change adaptation

7.40 The Met Office has released the UK Climate Projections 2018 study (UKCP18), which provides up to date information on how the climate of the UK is expected to change in the period up to the end of the 21st Century. In the highest emissions scenario, which may come to pass based on current emissions reduction trends, summer temperatures in the UK could be 5.4°C warmer by 2070 than the average summer between 1981 and 2000. Average summer rainfall would fall by 47% in this scenario. Winters could be up to 4.2C warmer, with up to 35% more rainfall by 2070.

7.41 Changes to the climate will bring new challenges to Greater Cambridge's built and natural environments. Hotter, drier summers may have adverse health impacts and may exacerbate the adverse environmental effects of air and water pollution. A changing climate may place pressure on some native species and create conditions suitable for new species, including invasive non-native species. 'Urban heat island' effects are also raised as an issue across the county by the Cambridgeshire Green Infrastructure Strategy, which can be managed through the management and planting of green space, tree planting and the creation of wetlands, especially in densely built up areas such as Cambridge and larger market towns.[227]

7.42 The low-lying nature of the county of Cambridgeshire also makes the wider area susceptible to both fluvial and (potentially) coastal flooding, which are susceptible to flooding regardless of climate change impacts, but which are expected to increase as a result of climate change. Due to its low lying nature (particularly in the fenland lying north of Cambridge), the plan area acts as a floodplain for two main drainage catchments – the Cam and the Great Ouse (the Cam is a tributary of the Great

[226] Cambridgeshire Horizons (2012) Cambridgeshire Renewables Infrastructure Framework (CRIF) – Baseline data, opportunities and constraints [Online] Available at: http://scambs.moderngov.co.uk/documents/s61865/Cambridgeshire%20Renewables%20Infrastructure%20Framework%20-%20Baseline%20Data%20Opportunities%20and%20Constraints.pdf

[227] Cambridge City Council, South Cambridgeshire District Council, Cambridgeshire County Council and other neighbouring authorities (2011) Cambridgeshire Green Infrastructure Strategy [Online] Available at: https://www.cambridge.gov.uk/media/2557/green-infrastructure-strategy.pdf

Ouse).[228] Much of Cambridgeshire's land, on a county level, is actively drained by pumping, which has a significant carbon footprint.[229]

7.43 **Figure 7.1** illustrates the distribution of flood risk across the plan area, showing that the majority of areas classified as Flood Zone 3[230] are concentrated on the northern border on the edge of the Fenlands coastal plain. Approximately 10 % of the Greater Cambridge area falls within Flood Zone 3), constraining in particular the outskirts of the villages of Over, Willingham, Cottenham, Water Beach and Swavesey.. An updated SFRA and Water Cycle Study are being commissioned to inform the Local Plan.

7.44 In order to encourage development that is more resilient to the impacts of climate change, the Greater Cambridge Sustainable Design and Construction SPD[231] promotes site-wide approaches to surface water drainage. A Surface Water Drainage Strategy must be submitted in order to demonstrate how the proposed surface water scheme has been determined following the drainage hierarchy. The Design and Construction SPD also requires proposals to reduce potential overheating through a 'cooling hierarchy' that prioritises passive design over mechanical ventilation/cooling mechanisms. Additionally, the Cambridgeshire Flood and Water SPD notes that FRAs should take a 'whole system' approach to drainage to ensure site discharge does not cause problems further along in the drainage sub-catchment/can be safely catered for downstream and upstream of the site and take the appropriate impacts of climate change into account for the lifetime of the development.[232]

Table 7.2 Key sustainability issues for Greater Cambridge and likely evolution without the Local Plan

Key sustainability issues for Greater Cambridge	Likely evolution without the new Local Plan	Relevant SA objective
While carbon emissions from all sectors have fallen in both districts since 2005, given the rural nature of South	Several policies in the South Cambridgeshire Local Plan seek to reduce per capital emissions, including CC1,	SA objective 12

[228] Cambridge City Council and South Cambridgeshire District Council (2010) Cambridge & South Cambridgeshire SFRA [Online]. Available at: https://www.cambridge.gov.uk/media/2560/ccc_sfra_report_text.pdf

[229] Cambridge City Council, South Cambridgeshire District Council, Cambridgeshire County Council and other neighbouring authorities (2011) Cambridgeshire Green Infrastructure Strategy [Online] Available at: https://www.cambridge.gov.uk/media/2557/green-infrastructure-strategy.pdf

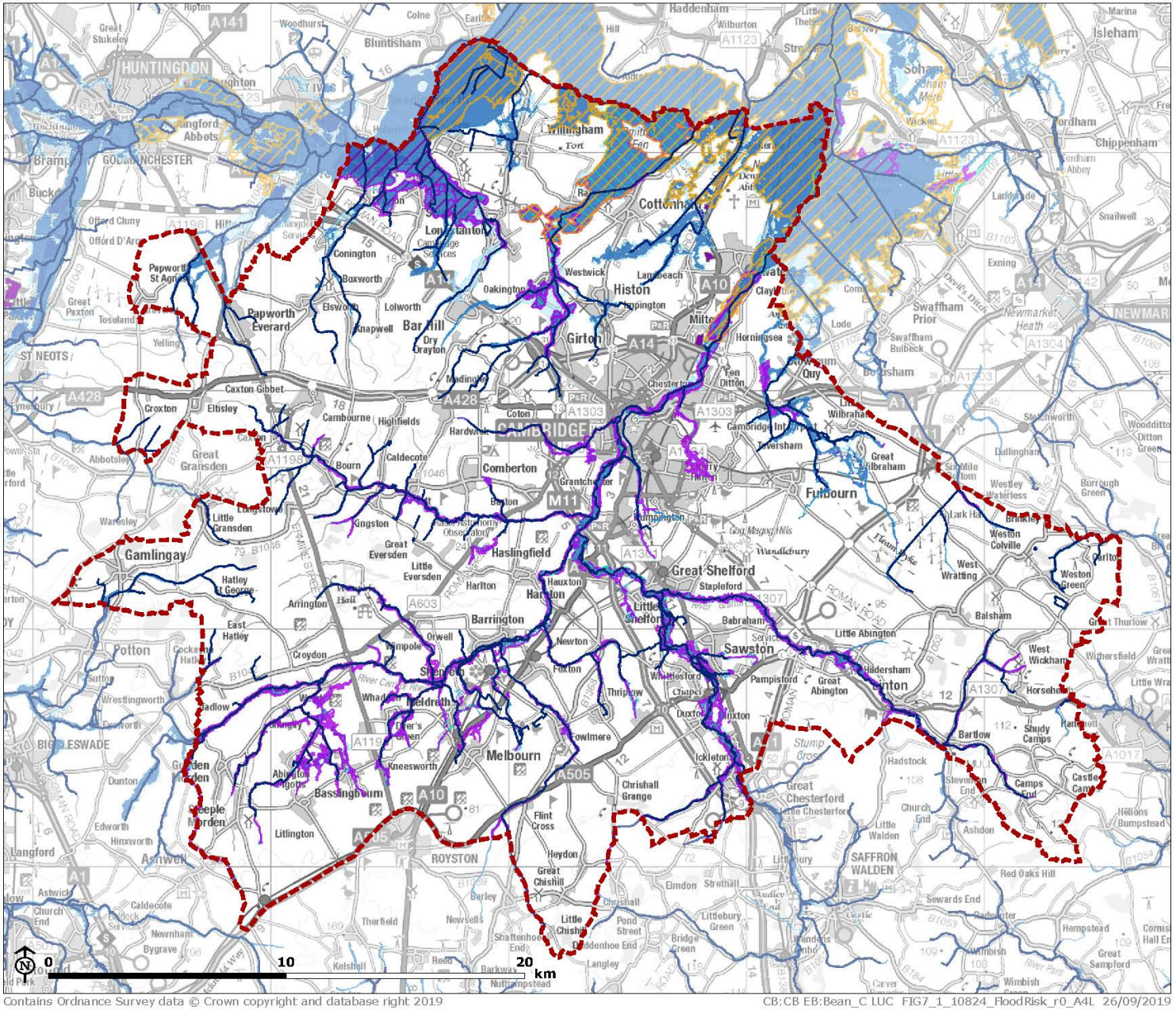
[230] Land assessed as having a 1 in 100 or greater annual probability of river flooding (>1%) or a 1 in 200 or greater annual probability of flooding from the sea (>0.5%) in any year.

[231] Greater Cambridge Sustainable Design and Construction SPD [Online] Available at https://www.cambridge.gov.uk/consultations/draft-sustainable-design-and-construction-spd-consultation

[232] Cambridgeshire County Council (2016) Cambridgeshire Flood and Water SPD [Online] Available at: https://www.cambridge.gov.uk/media/7107/cambridgeshire-flood-and-water-spd.pdf

Key sustainability issues for Greater Cambridge	Likely evolution without the new Local Plan	Relevant SA objective
Cambridgeshire there has been little progress on transport emissions, which still accounted for 50% of the total as of 2016. Both Councils have committed to meet net zero by 2050 at the latest, and to meet this will need to make significant shifts in energy efficiency of new and existing buildings, transport trends, and the further deployment of a range of renewables infrastructure.	CC2 CC/3 and CC/5, which require mitigation principles to be embedded in new development, encourage renewable energy generation and on-site generation, and measures to encourage home buyers to select sustainable options. Similarly, Policies 28, 29 and 30 of the existing Cambridge City Local Plan prioritise renewable energy generation, sustainable design and energy efficiency measures in existing dwellings. However since these plans were adopted the Councils have adopted more ambitious carbon reduction targets that will require more ambitious requirements of development to meet. The new Local Plan provides an opportunity to strengthen policies which act positively in terms of climate change, especially those that limit the need to travel through the appropriate siting and design of new development.	
The effects of climate change in Greater Cambridge are likely to result in extreme weather events (e.g. intense rainfall, prolonged high temperatures and drought) becoming more common and more intense.	Policy CC/1 of the South Cambridgeshire Local Plan require development to embed climate adaptation measures, including conservation of water, flood risk management, SuDs, a layout that combats overheating, and better linked habitat networks. Similarly, Policies 28, 31 and 32 of the Cambridge City Local Plan requires new development to adapt through sustainable design, water management and flood risk adaptation	SA objective 4 SA objective 11

Key sustainability issues for Greater Cambridge	Likely evolution without the new Local Plan	Relevant SA objective
	measures. While the new Local Plan will not influence extreme weather events, it can built upon the approach of current policy to better respond to current circumstances as evidence and techniques develop.	
Greater Cambridge will need to become more resilient to the increased risk of flooding in particular. Given the low-lying nature of the plan area, it is at significant risk of fluvial and surface water flooding, especially in the north, which is likely to be exacerbated by climate change.	Policy CC/8 and CC/9 of the South Cambridgeshire Local Plan require developments to be appropriately sites to take flood risk into account and to incorporate SuDS to manage surface water. Similarly, Policies 31 and 32 of the Cambridge City Local Plan require surface water to be managed close to its source where possible, including through SuDS, and to manage flood risk through siting. However the new Local Plan presents the opportunity, alongside national measures, to mitigate the effects of potential future flooding through appropriate siting of development and flood resilient design. It will also allow policy to respond to the update evidence based regarding flood risk in the plan area.	SA objective 4 SA objective 11



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Greater Cambridge SA

Figure 7.1: Flood Risk in Greater Cambridge

- Greater Cambridge
- Flood Zone 2
- Flood Zone 3
- Flood Zone 3a
- Flood Zone 3b
- Areas Benefiting from Flood Defence
- Watercourse
- Lake

Source: EA, OS

Map Scale @ A4: 1:225,000