

Basildon Borough Local Development Framework

Topic Paper TP2 Reducing the Effects of a Changing Climate

February 2012



Introduction

- 1 Climate Change is a global environmental challenge that will affect all forms of life in the future. Even changes that sound small – such as a 2°C temperature rise, or 20cm rise in sea levels– are predicted to have significant consequences⁽¹⁾
- 2 The ten warmest years on record have occurred since 1997. Global temperatures for 2000-2008 stand almost 0.2 °C warmer than the average for the previous decade⁽²⁾ It is largely accepted that most of the climate changes over the last 50 years have been made worse by human action, mainly an increase in greenhouse gas (GHG) emissions, like CO₂ from burning fossil fuels and methane from decomposing waste.
- 3 The UKCIP was established in 1997 to help co-ordinate scientific research into the impacts of climate change. It provides a range of tools, methods and guidance that can be used to help organisations identify how they might be affected by climate change and what they can do to minimise their risks or exploit the opportunities.
- 4 The UK Climate Projections (UKCP09) provide climate information designed to help those needing to plan how they will adapt to a changing climate. The projections have set out three global emissions scenarios based on high, medium and low forecasts for a range of climate and weather related impacts such as temperature, rainfall, flooding and other extreme weather events⁽³⁾
- 5 There are two concepts that need to be understood when talking about Climate Change: Adaptation and Mitigation.
 - Altering our behaviour to respond to these impacts of Climate Change is known as '**Adaptation**'. It means not only taking steps to minimise negative impacts, but also making us

better able to take advantage of any benefits⁽⁴⁾

- Climate Change '**Mitigation**' means limiting the extent of future Climate Change by reducing greenhouse gas emissions now and in the future. It can also mean removing carbon dioxide from the atmosphere, for example by planting more trees⁽⁵⁾
- 6 This topic paper will examine the following:
 - Ground conditions;
 - Flood risk;
 - Greenhouse gas emissions;
 - Efficiency of resources (water and energy).

Policy Context

International Policy Context

Ground Conditions

- 7 There are a number of European Union Directives relating to environmental protection. These have been translated into English legislation, are embedded into national planning policies and must be taken into consideration when formulating local policies. The one of most relevance to Basildon Borough and for this topic is:
 - EU Integrated Pollution, Prevention and Control (IPPC) Directive 2008.

Renewable Energy and Reduction of CO₂ Emissions

Adapting to climate change: towards a European framework for action – European Commission White Paper (2009)

- 8 This White Paper sets out a framework to reduce the EU's vulnerability to the impacts of climate change. A phased approach is outlined, which includes the integration of adaptation into key EU policy areas and stepping up international cooperation on adaptation.

1 UK Climate Predictions 2009. An introduction to the UK Climate Projections.
 2 Met Office, 2008. Global Temperatures.
 3 UK Climate Impacts Programme (2009)
 4 DEFRA: <http://www.defra.gov.uk/environment/climate/adapting/>
 5 DEFRA: <http://www.defra.gov.uk/environment/climate/mitigating/>

Copenhagen Accord (2009)

- 9 This document sets out an agreement between 115 world leaders, relating to climate change and includes the following statement:

“We underline that climate change is one of the greatest challenges of our time...we emphasise our strong political will to urgently combat climate change...to stabilise the GHG concentrations in the atmosphere at a level that would prevent dangerous anthropogenic interference with the climate system...recognising the scientific view that the increase in global temperature should be below 2 degrees Celsius”.

- 10 The agreement also suggests that:

“We agree that deep cuts in global emissions are required according to science, and as documented by the International Panel on Climate Change (IPCC) Fourth Assessment Report” and “Enhanced action on international cooperation on adaptation is urgently required”.

EU Directive 2009/28/EC

- 11 The Directive promotes the use of energy from renewable sources, where the UK has committed to source 15% of its energy from renewable sources by 2020.

Kyoto Protocol (2005)

- 12 The Kyoto Protocol is an addition to the United Nations Framework Convention on Climate Change (UNFCCC) which sets binding targets for the reduction of GHG emissions. It is currently signed by 191 parties. The Kyoto Protocol reaffirms the commitment under the UNFCCC to publish national programmes relating to climate change mitigation and adaptation.

National Policy Context

Ground Conditions

Soil Strategy 2009

- 13 The strategy sets out the Government's vision to improve the sustainable management of soil and tackle degradation

by 2029. It covers a range of sectors including agriculture, land management, planning and construction.

PPS7: Rural Development (2004)

- 14 This PPS states that the presence of the best and most versatile agricultural land (Grades 1,2 & 3a) should be taken into account alongside other sustainability considerations and that where significant development is unavoidable, poorer quality land (grades 3b, 4 and 5) should be used in preference to that of a higher quality for development purposes.

PPS23: Planning and Pollution Control (2004)

- 15 The PPS covers the quality of land, air, water and health impacts from development/land use and states that when preparing Development Plan Documents Local Planning Authorities should consider the following matters (NB. Only those regarding land have been listed):

- Address potential contamination of development proposals and subsequent remediation;
- Consider any potential sensitivities in the surrounding area from polluting developments (e.g. Landscape, soil, air and ground and surface water, nature conservation, agricultural lands quality, water supply, archaeological designations and natural resources);
- Consider whether it is appropriate to separate potential polluting schemes from other land uses.

Flood and Water Management

The Flood & Water Management Act 2010

- 16 The Act introduced a comprehensive management structure to protect people, homes and businesses from flood risk.

- 17 It established Lead Local Flood Authorities (LLFA) and Risk Management Authorities (RMA) with different roles and responsibilities in flood risk and water management. Essex County Council is the LLFA for Basildon Borough Council, alongside Thurrock Council which is the LLFA for the neighbouring Thurrock Borough.

- 18 Alongside new duties in preparing new plans called Preliminary Flood Risk Assessments (PFRA) and investigating flooding events, they will become Sustainable Drainage System (SuDS) Approval Bodies with responsibilities for approving proposed drainage systems in new development. They will also be required to adopt and maintain most approved SuDS.

Draft National Planning Policy Framework (NPPF)
- July 2011

- 19 The Government's objective is that planning should fully support the transition to a low carbon economy in a changing climate, taking full account of flood risk and coastal change. To achieve this objective, the planning system should aim to:
- avoid inappropriate development in areas at risk of flooding by directing development away from areas at highest risk or where development is necessary, making it safe without increasing flood risk elsewhere; and
 - reduce risk from coastal change by avoiding inappropriate development in vulnerable areas or adding to the impacts of physical changes to the coast.
- 20 To this end, Local Planning Authorities should adopt proactive strategies to mitigate and adapt to climate change.

Minimise vulnerability to climate change and manage the risk of flooding

- 21 New development should be planned to avoid increased vulnerability to impacts arising from climate change. When new development is brought forward in areas which are vulnerable, care should be taken to ensure that risks can be managed through suitable adaptation measures, including through the planning of green infrastructure.
- 22 Local Plans must be supported by Strategic Flood Risk Assessments and develop policies to manage flood risk, taking account of advice from the Environment Agency.
- 23 Local Plans should apply a sequential, risk-based approach to the location of development to avoid flood risk to people

and property where possible, and manage any residual risk, taking account of the impacts of climate change, by:

- applying the Sequential Test
- if necessary, applying the Exception Test
- safeguarding land from development that is required for current and future flood management
- using opportunities offered by new development to reduce the causes and impacts of flooding; and
- where climate change is expected to increase flood risk so that some existing development may not be sustainable in the long-term, seeking opportunities to facilitate the relocation of development, including housing, to more sustainable locations.

PPS25: Development & Flood Risk (2010)

- 24 This PPS sets out the Government's spatial planning policy on development and flood risk. It requires local planning authorities to undertake an 'all source' two staged Strategic Flood Risk Assessment (SFRA) and define Flood Zone 3b - functional floodplain, which factors in Climate Change. It also requires local planning authorities to apply SFRA and document the Sequential Test for LDF development locations, together with vulnerability classifications.

Renewable Energy and Reduction of CO2 Emissions

- 25 Tackling a changing climate is a key Government priority and there have been a number of Planning Policy Statements, Government Guidance and Advice, supported by ministerial announcements, published to encourage and deliver sustainable development.

Energy Act 2011

- 26 The Energy Act provides for some of the key elements of the Coalition's Programme for Government and its first Annual Energy Statement. The Act provides for a step change in the provision of energy efficiency measures to homes and businesses, and makes improvement to the framework to

enable and secure low-carbon energy supplies and fair competition in the energy markets.

those containing vulnerable people on low incomes and in hard-to-treat housing.

27 The Act includes provisions on:

- Green deal: the Act creates a new financing framework to enable the provision of fixed improvements to the energy efficiency of households and non-domestic properties, funded by a charge on energy bills that avoids the need for consumers to pay upfront costs. Although it is not anticipated that Local Authorities will become Green Deal Providers in their own right, they will play a central role working with households, businesses and energy firms in the implementation of the scheme.
- Private rented sector: the Act includes provisions to ensure that from April 2016, private residential landlords will be unable to refuse a tenant's reasonable request for consent to energy efficiency improvements where a finance package, such as the Green Deal and/or the Energy Company Obligation (ECO), is available. Provisions in the Act also provide for powers to ensure that from April 2018, it will be unlawful to rent out a residential or business premise that does not reach a minimum energy standard (the intention is for this to be set at EPC rating 'E').
- Energy Company Obligation: the Act amends existing powers in the Gas Act 1986, Electricity Act 1989 and the Utilities Act 2000 to enable the Secretary of State to create a new Energy Company Obligation that will:
 - Take over from existing obligations to reduce carbon emissions which expire at the end of 2012.
 - Work alongside the Green Deal finance offer by targeting appropriate measures at those households likely to need additional support - in particular

• The Act also includes measures to:

- Improve energy efficiency and energy security.
- Enable low-carbon technologies.
- Extend the role of the Coal Authority.

Annual Energy Statement (2010)

28 The Government's first Annual Energy Statement sets out progress to achieve the requirements of the Climate Change Act. It states that:

"The mission of this government is to support the transition to a secure, safe, low-carbon, affordable energy system in the UK, and mobilise commitment to ambitious action on climate change internationally".

29 In Action 22 the Government has asked the Committee on Climate Change for advice on the scope for targets more ambitious than the current ones, for energy from renewables sources. Action 23 states that the government will publish a renewables delivery plan to drive faster deployment through the next decade.

Household Energy Management Strategy (2010)

30 It was published on 2 March 2010, and placed a greater emphasis on district heating schemes and identified an essential role for planning in facilitating delivery of these and other community scale energy schemes.

Energy Act 2010

31 This Act was passed on 8th April 2010 and supports the Low Carbon Transition Plan to encourage a reduction in the carbon intensity of the grid. Focal points of the Act introduce provisions for the following: the introduction of an incentive for carbon capture and storage (CCS) technologies to be demonstrated in the UK at a commercial level; regular reporting on the

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decarbonisation of electricity generation; mandatory social price support for vulnerable energy customers, funded by energy companies.

Low Carbon Transition Plan (2009) and Renewable Energy Strategy (2009)

- 32 They were both published on 15 July 2009 and set out how the UK will achieve dramatic reductions in emissions and meet targets on renewables.

UK Renewable Energy Strategy 2009

- 33 This strategy indicates how the UK will meet the target set in the EU Directive 2009/28/EC.

Climate Change Act 2008

- 34 The Act introduced a statutory target of reducing carbon emissions by 80 per cent below 1990 levels by 2050, with an interim target of 34% by 2020. The Fourth Carbon Budget(17/05/2011) introduced an interim target to cut Carbon emissions by 50% by 2025.

Planning Act 2008

- 35 This Act underpins the policies in the supplement to PPS1 and introduces statutory duties on development plan documents to include policies designed to secure that the development and use of land in the local planning authority's area contribute to the mitigation of, and adaptation to, climate change.

Planning and Energy Act 2008

- 36 It gives statutory support for local planning authorities to set requirements for energy use and energy efficiency in their development plan documents (DPDs). DPDs may include policies imposing reasonable local requirements for:
- a proportion of energy used in development in their area to be energy from on-site renewable energy;
 - a proportion of energy used in development to be from local low carbon sources; and/or
 - development in the area to comply with energy efficiency standards that

exceed the energy requirements of building regulations.

Energy Act 2008

- 37 It introduced powers for a Feed-In Tariff and the Renewable Heat Incentive aimed at driving an increase in renewable energy generating capacity, and which is likely to have an impact on planning.

Code for Sustainable Homes (2007)

- 38 The Code is an environmental assessment rating method for new homes in England which:

- identifies a set of issues which are known to impact on the environment
- establishes performance measures which:
 - are known to reduce environmental impacts
 - exceed the requirements of legislation and regulations
 - can be objectively assessed, evaluated and delivered in a practical and cost effective way by the construction industry.
- identifies environmental issues for which mandatory minimum performance must be achieved in order to gain a Code rating
- assesses environmental performance in a two stage process (Design stage and Post construction) using objective criteria and verification
- records results of the Code assessment on a certificate assigned to the dwelling.

- 39 The Code defines a set of sustainable design principles for new housing covering performance in nine key areas, known as 'Categories': Energy and CO2 Emissions; Water; Materials; Surface Water Run-off; Waste; Pollution; Health and Well-being; Management; Ecology.

Building a Greener Future: Policy Statement (2007)

- 40 This statement sets out the Government's intention for all new homes to be zero carbon by 2016 with a major progressive tightening of the energy efficiency building regulations:
- by 25 per cent in 2010
 - by 44 per cent in 2013
 - up to the zero carbon target in 2016

Draft National Planning Policy Framework (NPPF) - July 2011

- 41 The Government's objective is that planning should fully support the transition to a low carbon economy in a changing climate, taking full account of flood risk and coastal change. To achieve this objective, the planning system should aim to:
- Secure, consistent with the Government's published objectives, radical reductions in greenhouse gas emissions, through the appropriate location and layout of new development, and active support for energy efficiency improvements to existing buildings and the delivery of renewable and low-carbon energy infrastructure.
 - Minimise vulnerability and provide resilience to impacts arising from climate change.
 - Adopt proactive strategies to mitigate and adapt to climate change.

Support cuts in greenhouse gas emissions

- 42 To support the move to a low-carbon economy, local planning authorities should:
- plan for new development in locations and ways which reduce greenhouse gas emissions; and
 - when setting any local requirement for a building's sustainability, do so in a way consistent with the Government's zero carbon buildings policy and adopt nationally described standards.

Support the delivery of renewable and low-carbon energy

- 43 To help increase the use and supply of renewable and low-carbon energy, local planning authorities should recognise the responsibility on all communities to contribute to energy generation from renewable or low-carbon sources. They should:

- have a positive strategy to promote energy from renewable and low-carbon sources, including deep geothermal energy
- design their policies to maximise renewable and low-carbon energy development while ensuring that adverse impacts are addressed satisfactorily
- consider identifying suitable areas for renewable and low-carbon energy sources, and supporting infrastructure, where this would help secure the development of such sources
- support community-led initiatives for renewable and low carbon energy, including developments outside such areas being taken forward through neighbourhood planning; and
- identify opportunities where development can draw its energy supply from decentralised, renewable or low carbon energy supply systems and for co-locating potential heat customers and suppliers.

PPS 1 Delivering Sustainable Development (2005)

- 44 The PPS sets out the over-arching principle of achieving sustainable development in the planning process and promotes pro-active planning, with an emphasis on meeting the needs of the present without compromising the ability of future generations to meet their own needs.

- 45 The key principles to apply to ensure that development plans and decisions taken on planning applications to contribute to the delivery of sustainable development include:

- A spatial planning approach should be at the heart of planning for sustainable development.
- Development plans should ensure that sustainable development is

pursued in an integrated manner, in line with the principles for sustainable development set out in the UK strategy. Local planning authorities should ensure that development plans promote outcomes in which environmental, economic and social objectives are achieved together over time.

- Local planning authorities should ensure that development plans contribute to global sustainability by addressing the causes and potential impacts of climate change – through policies which reduce energy use, reduce emissions, promote the development of renewable energy resources, and take climate change impacts into account in the location and design of development.
- Planning policies should promote high quality inclusive design in the layout of new developments and individual buildings in terms of function and impact, not just for the short term but over the lifetime of the development. Design which fails to take the opportunities available for improving the character and quality of an area should not be accepted.

PPS 1: Planning and Climate Change Supplement to PPS1 (2007)

- 46 This PPS supplement bolsters the requirement for the planning system to proactively contribute to the management of the UK's climate change programme at local policy and development management levels. It included greater clarity on the expectations of action at a local level for renewables and low-carbon energy generation, decentralised energy systems, sustainable buildings and construction and environmental performance over the lifetime of development.
- 47 "Planning authorities should:
- not require applicants for energy development to demonstrate either the overall need for renewable energy and its distribution, nor question the energy justification for why a proposal for such development must be sited in a particular location;
 - ensure any local approach to protecting landscape and townscape

is consistent with PPS22 and does not preclude the supply of any type of renewable energy other than in the most exceptional circumstances;

- alongside any criteria-based policy developed in line with PPS22, consider identifying suitable areas for renewable and low-carbon energy sources, and supporting infrastructure, where this would help secure the development of such sources, but in doing so take care to avoid stifling innovation including by rejecting proposals solely because they are outside areas identified for energy generation; and
 - expect a proportion of the energy supply of new development to be secured from decentralised and renewable or low-carbon energy sources." (Paragraph 20)
- 48 "Any local requirements need to be justified on the basis of specific local evidence and viability considerations." (Paragraphs 31 to 33)
- 49 This PPS was published to help support the achievement of zero carbon homes through the planning system.

PPS22: Renewable Energy (August 2004)

- 50 This PPS states that sites for renewable energy should only be allocated in a Local Development Document where there is a known viable proposal, which will be brought forward during the plan period. One of the key principles of PPS22 is that renewable energy developments should be capable of being accommodated where the technology is viable and environmental, economic and social impacts can be addressed satisfactorily.

Regional Policy Context

Flood and Water Management

- 51 Policy WAT4 in the *East of England Regional Plan (2001-2021) (to be revoked)* states that Local Development Documents should:
- Use SFRA to guide development away from floodplains, other areas at medium or high risk, or likely to be

at future risk from flooding and areas where development would increase the risk of flooding elsewhere;

- Include policies which identify and protect flood plains and land liable to tidal/coastal flooding from development;
- Only depart from the above in exceptional cases as stated;
- Require SuDs to be incorporated into all appropriate developments.
- Areas of functional floodplain needed for strategic flood storage in Thames Estuary should be identified and safeguarded by LPAs;
- Ensure timely provision of appropriate additional infrastructure for water supply and waste water treatment to cater for levels of development provided, whilst meeting surface and ground water quality standards and avoiding impact on sites of EU or international importance for wildlife;
- Site new development so as to maximise the potential of existing water / waste water treatment infrastructure and minimise the need for new/improved infrastructure.

The Environment Agency's South Essex and North Essex Catchment Flood Management Plans 2008

- 52 These plans set out policies for the long-term management of flood risk within the Essex catchment, taking into account the likely effects of changes in climate, land use, land use management and urban development.
- 53 The Environment Agency's Thames Estuary 2100 project (TE2100) was established in 2002 to develop a long-term tidal flood risk management plan for London and the Thames Estuary in response to changing climate concerns and an ageing flood defence system. The final TE2100 Plan has been submitted to DEFRA for consideration, while an implementation plan and business case is being prepared for the treasury, which is due to be completed in March 2012.

Renewable Energy and Reduction of CO₂ Emissions

- 54 The East of England Plan 2001-2021 (to be revoked) includes Policies ENG1 (Carbon Dioxide Emissions and Energy Performance) and ENG2 (Renewable Energy Targets). Policy ENG1 seeks to locate and design new development to optimise carbon performance and sets interim targets for developments of 10 dwellings or 1,000m² non-residential or more, to secure at least 10% of their energy from decentralised and renewable or low-carbon sources, unless this is not feasible or viable. Policy ENG2 supports the development of new facilities for renewable power generation, with the aim that by 2020, 17% of the region's energy will come from renewable sources.
- 55 The Regional Economic Strategy for the East of England 2008-2031, 'inventing our Future. Collective Action for a Sustainable Economy' (Autumn 2008) states that a reduction in CO₂ emissions to 60% below 1990 levels by 2031 would put the region at the forefront of tackling climate change and in a prime position to exploit the global commercial opportunities of the \$548 billion environmental goods and services market.

Local Plan, Programmes and Policies

Ground Conditions

Basildon District Contaminated Land Strategy 2007

- 56 The Strategy states that the Council is the primary regulator in respect of the Environmental Protection Act 1995. Where land becomes a risk to potential new receptors as a result of a change of use, the Planning acts and their regime apply.
- 57 A survey undertaken in 1990 of derelict and contaminated land in the Borough showed that about 0.3% of the total land area was at that time contaminated.
- 58 There are records showing sites within the Borough which used to be used for:

- Industrial processing (including a nitro-glycerine works, a chrome plating works and plastic works)
- Ammunition stores (Wat Tyler/Basildon Golf Course)
- Landfill sites (Pitsea Tip, former Vange Tip, Vange Marsh)
- Sewage Treatment Works (Mountnessing Road/Barleylands Depot)

59 Historically, Basildon Borough has been a predominantly rural area with only a few heavy processing industries and mineral excavation sites. There are a few pockets of dereliction in the area and relatively little land may therefore be classed as contaminated. Most despoiled land in the Borough, such as landfill sites, has, over time, been reclaimed for amenity and recreation through appropriate remediation measures.

Flood and Water Management

60 As a result of the *Environment Agency's South Essex and North Essex Catchment Flood Management Plans 2008*, the Borough is subject to the following national flood management policies which are enforced by the Environment Agency:

- Take action to store water and manage run-off in the Upper Crouch Valley and Billericay;
- Take further action to sustain flood risk in Laindon, Basildon & Pitsea;
- Take further action to reduce flood risk in Wickford;
- Reduce existing flood risk management actions, accepting that flood risk will increase over time in north-west Billericay;

61 The southern part of the Borough including Bowers Marsh and the northern most part of the Fobbing Marshes is covered by the TE2100 project boundary and the following policies apply:

- Policy 4 applies to Bowers Marsh which takes further action to sustain the current level of flood risk into the future.

- Bowers Marsh has been identified in the Final TE2100 Plan as a preferred site for intertidal habitat creation. Successful habitat creation at this site (and St Mary's Marsh in Kent) will create enough intertidal habitat to satisfy requirements up to 2050.
- Policy 3 applies to Fobbing Marshes which seeks to continue with existing or alternative actions to manage flood risk at the current level, accepting that flood risk will increase over time from this baseline. Local secondary defences would still be provided to protect key sites where necessary.

Portrait

Effects of Climate Change in the Region and Sub-Region

In the East of England

62 According to the Environment Agency, Climate Change is the biggest threat to people and the environment in the East of England. Actions must be taken now to reduce the effects of climate change and adapt to its impacts⁽⁶⁾

63 The region is characteristically dry, with low annual average rainfall and hot, dry summers. It is also low-lying which makes its coastal regions particularly vulnerable to sea level rise. The frequency of dry summers has increased over the decades, with 10 of the driest summers occurring in the last 30 years.

64 UKCIP's Climate Change projections for the 2080's in the East of England, under a medium emissions scenario,⁽⁷⁾ forecast:

- hotter summers, with mean temperatures likely to increase between 1.9°C and 5.9°C on 1990 levels;
- drier summers, with a range of precipitation between 6% and -45%;
- warmer winters, with temperatures predicted to increase between 1.6 °C and 4.7°C; and
- wetter winters, with precipitation predicted to increase between 4% and 44%.

6 Source: Environment Agency - State of our environment report, East of England - March 2010.

7 Environment Agency - State of our environment report, East of England - March 2010.

- 65 In the summer months, these changes are predicted to affect the amount and distribution of rainfall, and the demand for water which will contribute additional pressure on the limited water resources in the Region. The average natural summer flows of the rivers could drastically reduce; the period where the groundwater resources are traditionally replenished could be shorter; and water resources could become much more vulnerable. There may be greater variability and droughts or floods may become more frequent.
- 66 An increase in winter precipitation could put the East of England's water infrastructure at risk. The reliability of existing reservoirs, groundwater extractions and river intakes will change beyond design. Some infrastructure, also critical in supplying water, may be more vulnerable to flooding⁽⁸⁾

In the Thames Gateway

- 67 Much of the Thames Gateway is located within the flood plain of the tidal River Thames and its tributaries and many parts of the Thames Gateway are already vulnerable to flooding. With a continuing rise in sea level, increased river flows, heavier rainfall, more intense storm surges and the natural sinking of South East England⁽⁹⁾, the risk of flooding in the Thames Gateway is set to increase if not appropriately managed.
- 68 The current demand for water in the Thames Gateway is high compared to the supply available. Climate Change will make this even more challenging with changing rainfall patterns and increased temperatures⁽¹⁰⁾

Climate Change Adaptation

- 69 Vulnerabilities to extreme weather in the East of England include: high temperatures/ heat waves; and excessive rainfall/ flooding. Overall, there is a clear need for a specific policy response to ensure that new development is resilient to unavoidable climate change.

- 70 Areas where planning policy can influence resilience to climate change, are: managing high temperatures; managing flood risk; managing water resource and water quality; and managing ground conditions .

Climate Change Mitigation

- 71 As explained earlier Climate Change mitigation measures include reducing greenhouse gas emissions now and in the future.
- 72 Reducing emissions is critical to ensuring global temperatures do not rise more than 2°C. Local authorities are uniquely placed to provide vision and leadership to local communities by raising awareness and influencing behavioural change.

Geology and Hydrology

Geology & Soils

- 73 The British Geological Survey confirm that predominant solid geology underlying the Basildon Borough is Thames Group Clay. The majority of the Borough does not have any drift geology overlying it, apart from some deposits in the north, around Billericay's urban area, where Bagshot Beds (made up of sand and clays) are present.
- 74 Soil characteristics have a significant affect on how the catchment responds to rainfall. The presence of seasonally wet, deep clay soils across the Borough that are relatively impermeable, means they will contribute to rapid runoff of surface water, and cause watercourses to respond rapidly to rainfall.

Soil Quality and Contaminated Land

- 75 The best and most versatile agricultural land is defined as Grades 1,2 and 3a. This land is the most flexible, productive and efficient in response to inputs and can deliver higher yields of crops for food and non food use.

8 Source of paragraphs 62 to 66: Environment Agency - State of our environment report, East of England - March 2010.
9 Environment Agency - Thames Gateway State of the environment report - October 2010
10 Environment Agency - Thames Gateway State of the environment report - October 2010.

76 Agricultural land in the Borough is of Grade 3 & 4 quality, with no high quality grade 1 or 2.

77 There are no Control of Major Accident & Hazard (COMAH) sites or Special Sites in the Borough, although 57 Permitted Installations are subject to focused regulation (including service stations, waste oil burners, cement and lime, cremation, dry cleaners etc) to ensure breaches to the Environmental Protection Act 1990 do not occur.

78 Historically, Basildon Borough has been a predominantly rural area with only a few heavy processing industries and mineral excavation sites. There are a few pockets of dereliction in the area and relatively little land may therefore be classed as contaminated. Most despoiled land in the Borough, such as landfill sites, has, over time, been reclaimed for amenity and recreation through appropriate remediation measures.

79 However, a survey undertaken in 1990 of derelict and contaminated land in the Borough showed that about 0.3% of the total land area was at that time contaminated.

80 Records also show sites within the Borough that were used for:

- Industrial processing (including a nitro-glycerine works, a chrome plating works and plastic works)
- Ammunition stores (Wat Tyler/Basildon Golf Course)
- Landfill sites (Pitsea Tip, former Vange Tip, Vange Marsh)
- Sewage Treatment Works (Mountnessing Road/Barleylands Depot)

Hydrology

81 The Rivers Crouch and Wid and their tributaries are the main source of fluvial flood events in the Borough. From its source in Little Burstead, the Crouch flows for 16km to Battlesbridge (just outside the Borough in Rochford District), draining a catchment area of 110km², until it becomes part of the Crouch Estuary. The north west of the Borough drains northwards into the

River Wid, which adjoins the River Chelmer and subsequently the Blackwater, before meeting the North Sea at Maldon.

82 In the south of the Borough are the Vange, Fobbing and Bowers Marshes, comprising a network of channels and rivers. These drain into Vange Creek and Holehaven Creek which flow south to the River Thames Estuary approximately 4km to the south.

Flood Risk

Fluvial

83 The South Essex Strategic Flood Risk Assessment (SFRA) has identified that the main source of fluvial flooding is the River Crouch and its tributaries, as well as the River Wid. The most significant flood events have occurred in the past when high rainfall events in the catchment area of the Rivers Crouch and Wid have coincided with high tidal water levels downstream, as well as low pressure weather systems. This combination has resulted in higher river levels, resulting in breaches of river banks and in some cases flood defences where the carrying capacity of river channels has been exceeded.

84 Fluvial flood defences predominantly consist of maintained channels and washlands which are designed and maintained to offer different standards of protection which vary between 50-100 years.

Tidal

85 The SFRA has identified that tidal flooding risks are posed to the Borough from the Thames Estuary. Tidal flooding may occur during storm surge conditions characterised by wind driven waves and low atmospheric pressure coupled with high spring tides. In areas protected by sea defences, tidal flooding can still occur as a result of a breach in the defences, failure of a mechanical barrier or overtopping of defences.

86 Basildon Borough is protected from the extreme effects of tidal flooding by two flood barriers, concrete walls and earth embankments, designed to protect South Essex from a 1 in 1000 year flood event.

- 87 In the event of a breach in sea defences outside the Borough, the low-lying marshland and drainage channels in the south, provide pathways for floodwater which will tend to pool at low-lying areas adjacent to a defence breach.
- 88 Fortunately, the southern extent of the Borough only has a few residential properties at risk from tidal flooding as it is predominantly either used for agricultural, waste management or recreational uses.

Surface Water

- 89 Surface water flooding typically arises when intense rainfall, often of short duration, is unable to soak in the ground and/or enter drainage systems. It can run quickly off land, resulting in localised flooding.
- 90 The Environment Agency's National Pluvial Model has mapped the "Areas Susceptible to Surface Water Flooding" to inform Emergency Planning. When cross-referenced against the national property database DEFRA reports that around 7,900 properties within the Borough are estimated to be susceptible to surface water flooding.
- 91 Several watercourses and ditches across the Borough cause surface water flooding problems arising from outstanding maintenance or general asset condition. From 2011/2012 these will be pro-actively addressed as part of the South Essex Surface Water Management Plan and through the new regulatory regime introduced by the Flood Water Management Act 2010, enforced by the lead Local Flood Authority for the borough, Essex County Council.

Sewer & Groundwater Flooding

- 92 Sewer flooding is defined as flooding which occurs when the capacity of the underground system is exceeded, resulting in flooding inside and outside of buildings. Normal discharge of sewers and drains through outfalls may in turn be impeded by high water levels in receiving water courses, or as a result of excessive wet weather or tidal conditions. Records from Anglian Water Services show that there were 12 records of sewer flooding between

2001 and 2011, principally arising following heavy rainfall that overwhelmed the local drainage network. Likewise, groundwater flooding occurs when water levels in the ground rise above surface elevations. The Borough has a low susceptibility to groundwater flooding owing to its underlying geology, the impermeable characteristics of which prevent it from rising to the surface. The Environment Agency have no records of groundwater flooding for the Borough.

Strategic Flood Risk Assessment

- 93 The SFRA Level 1 (June 2011) established that:

Fluvial

- The primary cause of frequent flooding in the Borough is from pluvial sources (rainfall), predominantly in the urban centres of Billericay, Wickford and Basildon, which often coincide with fluvial flooding (from rivers) of the River Crouch and its tributaries.
- The Borough's washland system, the majority of which was installed as part of Basildon New Town during the 1960s/1970s, performs a surface water management function for the urban areas. It consists of a series of storage areas and reservoirs, connected via a drainage network, which enables the attenuation of storm water during heavy rainfall events, prior to its release into watercourses which prevents most pluvial flooding from occurring or being significant.
- The most significant fluvial flood events tend to occur when high rainfall in the upper catchment of the River Crouch coincides with high tidal water levels in the lower River Crouch producing high volume fluvial flows and elevated water levels in the river and its tributaries. The EA's Flood Zones (1, 2 and 3a) delineate the variation in probability of flooding from these watercourses and have been used for the first time to designate the Borough's Functional Floodplain, otherwise known as Flood Zone 3b.

Surface water

- The Council's emergency planning records of surface water flooding incidents have also been mapped and used to verify the EA's 'Areas Susceptible to Surface Water Flooding' dataset to check its integrity. As the EA's dataset is relatively new, it had never been tested in this way before, and it has not been able to be verified as to whether the model's results correspond with what occurs on the ground. The Level 1 SFRA recommends that this information is used to inform any future revisions of the Council's Emergency Planning procedures and to determine locations for future maintenance priorities of watercourses, ditches, etc to help manage excess surface water.

Tidal

- The southern part of the Borough is located next to Vange Creek and East Haven Creek, on the northern banks of the River Thames Estuary. Flood defences along this bank, as well as two flood barriers at Fobbing Horse and Benfleet Creek, help to protect this part of the Borough from tidal flooding. The risk of flooding from tidal sources is therefore a residual risk, given the defences that are in place. Tidal flooding would therefore only occur in the Borough in the event of a defence failure (a breach), which must be tested for its potential effects in more detail in a Level 2 SFRA.

94 The SFRA Level 2 (September 2011) established that:

- A proportion of the Borough in the south is at risk of tidal flooding, if existing defences fail or are overtopped. This is known as the 'residual risk'.
- There are a number of potential circumstances which may lead to a failure of the defences. These are:

- Floodgates being left open;
- Water pressure during high tides;
- Shipping traffic collision;
- Damage to a pipeline running through the tidal wall;
- Operational failure of the floodgate;
- A vehicle collision;
- Floating object collision (e.g. Shipping container);
- Damage/explosion at a landward installation.

- Breaches are more likely to occur during high water level events, including extreme tides when loads on the defences will be greater.
- Flooding as a result of a failure in one/ both of the flood barriers protecting the Borough has the potential to generate considerable flood hazard, damage to homes, businesses, infrastructure, as well as risk to lives and the need for an 'emergency response'. The Level 2 SFRA has therefore assessed failure in further detail.
- The SFRA modelling suggests that if a breach occurred or if the defences were overtopped, the worst case scenario would result in flood depths, flood hazard (an understanding of depth, speed and debris) as well as inundation rates.

95 Regarding the Surface Water Flood Risk, the SFRA Level 2 established that:

- Since the Level 1 SFRA was prepared, a new dataset has been made available by the EA regarding surface water flooding called the Flood Map for Surface Water (FMfSW).
- The FMfSW gives an indication of the broad areas within the Borough that are likely to be risk of surface water flooding.
- The FMfSW has been used to screen Areas of Search and Urban Sites to determine whether the spatial development options in the LDF Core

- Strategy are at risk of surface water flooding.
- The South Essex Surface Water Management Plan (SWMP) is building on this even further using a bespoke rainfall model of the Borough to provide information on surface water flood depths and hazard ratings. The Level 2 SFRA provides a reference to this work.

96 Level 2 SFRA – Area Assessments

- The Level 2 SFRA has carried out a thorough screening exercise in the Borough to determine whether there are any areas where flood risk would be an insurmountable problem to future development, or whether there are areas which could be pursued for future development subject to appropriate mitigation measures.
- The Level 2 SFRA groups the Areas of Search into four types:
 - Areas subject to medium/ high flood risk with increased risk to surface water flooding
 - Areas subject to low flood risk but increased risk to surface water flooding
 - Areas not at risk of flooding or increased risk to surface water flooding
 - Areas at residual risk of flooding from tidal sources

Water Management

Water Resources & Supply

- 97 Drinking water in Basildon Borough is supplied by Essex and Suffolk Water (ESW), from the Essex Resource Zone(ERZ). The zone is highly integrated which provides a large degree of flexibility for moving water around the zone to where it is required.
- 98 Water within the ERZ is sourced from the rivers Chelmer, Blackwater, Stour and Roman River which support pumped storage reservoirs at Hanningfield and Abberton and treatment works at Langford, Langham, Haningfield and Layer. There are also groundwater resources which supply approximately 3% of the zone's

demand from the chalk well, and additional sources in the south and south west at Linford, Stifford, Dagenham and Roding.

- 99 Approximately 30% of the water supplied in the Essex supply area comes from outside Essex from the following two main sources:

- The Chigwell raw water bulk supply from Thames Water, which is provided via a transfer from the Lea Valley reservoirs; and
- The Ely-Ouse to Essex Transfer Scheme (EOETS) which transports water from the Ely Ouse River at Denver in Norfolk to the Hanningfield and Abberton Reservoirs.

- 100 In dry years, the contribution from these two external sources may be as much as 50% of the water supplied in the Essex supply area. In addition, the Environment Agency operates two river support schemes on the Great Ouse and Stour which can also be called upon in dry conditions.

- 101 ESW also operate an effluent recycling scheme at Langford, near Maldon, which intercepts effluent from Chelmsford Waste Water Treatment Works which is treated and recycled at Langford, before being pumped into the River Chelmer where it mixes with river flows to allow re-abstraction and transfer to Hanningfield Reservoir.

- 102 Scenario modelling has shown that supply is currently insufficient to meet demand and with no action the deficit will worsen as a result of increased demand and climate change.

- 103 ESW's main strategy for meeting the future demand for water resources is to increase the storage capacity of Abberton Reservoir, outside Colchester, Essex and apply a commensurate increase and transfer from the Ely-Ouse water transfer scheme which is to be operational by 2014.

- 104 Until 2014, South Essex will therefore be deficient in water during drought years to cope with its water resource needs, meaning that development phasing up to 2014 will need to be appropriately managed so that it does not exacerbate the problem.

Renewable Energy and Reduction of CO2 emissions

Greenhouse Gases emissions

- 105** In 2007 (latest data available), the East of England contributed a total of 44 million tonnes of CO₂ to the UK's total CO₂ emissions of 513 million tonnes (8.6%). Although the results are not directly comparable, the region's 2007 total CO₂ emissions were 3 million tonnes less than in 2005. Industry and Commerce produced 15 million tonnes of CO₂ – 36% of the region's total.
- 106** The second largest source of CO₂ in the region was road transport, responsible for 14 million tonnes in 2007. The region contributed the third largest amount of road transport CO₂ across all UK regions, behind the South East (21.5 million tonnes) and the North West (15 million tonnes). The predominance of semi-rural and, in parts, wealthy communities in the East of England have contributed to high road transport emissions due to commuting. Further, the region contains many of the UK's most important international gateways and transport corridors.
- 107** Domestic sources contributed 13 million tonnes - 30% - to the regions total CO₂ emissions, of which 5 million tonnes came from domestic gas, and 6 million tonnes came from domestic electricity.
- 108** In the East of England, the average person produced 7.79 tonnes of CO₂ in 2007. This figure is 0.23 tonnes less than the 2006 average per capita emissions, and 0.63 tonnes less than the UK average of 8.42 tonnes/person in 2007.
- 109** The East of England could reduce its emissions by reducing the energy demand, increasing the uptake of energy efficient processes, and increasing the number of renewable energy installations.

Renewable Energy

- 110** If the UK is to have a low carbon economy, energy will have to be supplied through a flexible, localised system utilising renewable sources including biomass, wind, wave, solar combined heat and power, and fuel cells.
- 111** A national target has been set to generate 15% of the UK's electricity supply from renewable sources by the end of 2020.
- 112** The East of England has adopted a provisional target for 2020 of 44% of its electricity to come from renewable sources.⁽¹¹⁾

Opportunities in the Region, Sub-region and Locally

- 113** There are, in the Region and the County, several opportunities that Basildon Borough could utilise to mitigate the effects of and adapt to Climate Change, whilst also creates new employment sectors in the area.
- 114** Indeed, research⁽¹²⁾ undertaken at a regional and sub-regional level has shown that:
- The East of England is well placed for opportunities in low carbon. For example, in 2008/09 the market value of low carbon environmental goods and services in the region was £12.86 billion, around 9.2% of the UK market, with 6,200 companies employing around 103,000 people. Low carbon environmental goods and services include renewable energy sources such as wind, as well as, alternative fuel vehicles and building technologies. Further, the region has a comparative advantage in low carbon vehicles (UK leading position), recovery and recycling, carbon capture and storage, as well as biomass (ranked second in UK).
 - In June 2009, the East of England was considered the leading region for the generation of renewable energy, reaching 504 MegaWatts

11 Source of paragraph 12 to 20: Environment Agency - State of our environment report, East of England - March 2010.
 12 Environment Agency - State of our environment report, East of England - March 2010; Environment Agency - Thames Gateway State of the environment report - October 2010; East of England Renewable Energy Statistics, Renewable East - December 2009.

(MW) of installed capacity from both onshore and off-shore sources. This equates to about 2,220 GigaWatt hours/year (GWh/years) of renewable electricity and the saving of over 870,000 tonnes of carbon emissions a year. It has been estimated that 8.1% of the region's consumed electricity comes from renewables, with on-shore sources contributing 7.3% of this total.

- Compared to other regions, the East of England has the largest number (107 sites) of on-shore wind and landfill gas sites generating electricity in 2008, with the North West a close second with 98 sites. The large, flat agricultural areas in the North of the East of England make it suitable for renewable wind energy generation.
- Conversely initial findings from a report on the opportunities for hydropower in the UK (February 2010) show that in the East of England, many sites have high fish sensitivities and low power potentials due to the low-lying nature of the region.
- At an Essex level (December 2009), the installed generating capacity (MW) from renewables was:⁽¹³⁾
 - On-shore Wind: NIL;
 - Biomass: 12.767 MW;
 - Landfill Gas: 87.825 MW - this represents the second largest installed renewable energy capacity (20%);
 - Sewage Gas: 0.342 MW;
 - Micro-generation (<50 kW): 0.106 MW.

115 A study undertaken in April 2011 for the East of England,⁽¹⁴⁾ has used the following assumptions:

- Even though the Localism Act proposes to abolish Regional Spatial Strategies, it has been assumed that local authorities will continue to develop LDF on the basis of these regional targets for the time being.
- The total energy demand for the East of England is projected to rise by 2% between 2011 and 2020 with efficiency improvements partially offsetting increased demand from growth. The total predicted consumption for 2020 is 99,437 GWh of which 69% is heat and 31% electricity

116 This study has shown that the total renewable energy resource potential could meet 261% of the projected 2020 energy demands, the majority of this (224%) being from wind generation assuming that there are no limits on turbine installations from landscape impact or cumulative impact. Under the assumption that only 10% of the areas identified for wind generation can be developed, then the total resource potential expressed as a proportion of 2020 demands would be reduced to 55%.

117 When realistic uptakes for 2020 are considered, the potential for renewable energy in the East of England is around 10 % of the projected energy demands. These figures are based on locally available resources and do not include the energy contribution from imported feedstocks or the contribution that offshore technologies (primarily offshore wind) can make. However they do indicate that even under the very optimistic resource potential scenario, renewable energy can only meet around half of the region's demand, and in reality, this is likely to be much lower.

118 The Thames Gateway is a net exporter of electricity, having 9% of the UK's electricity generating capacity, but only 1.3% of its consumption (in 2008, 4,566 GWh of

13 East of England Renewable Energy Statistics, Renewable East - December 2009.

14 East of England Renewable and Low Carbon Energy Capacity study - For the Department for Energy and Climate Change - April 2011, AECOM.

electricity was consumed in the Thames Gateway). The capacity for the Thames Gateway to generate energy is as follows: ⁽¹⁵⁾⁽¹⁶⁾

- 8 major power stations fuelled by gas, coal or oil, and generating around 7.65 GW of electricity;
- 24 major sources of renewable energy with a total generating capacity of 78 MW (in 2008 these produced 276 GWh of electricity);
- 33 Combined Heat and Power plants which have an electrical generation capacity of just under 200MW and in 2008 generated just under 1,000 GWh of electricity and almost 3,000 GWh of heat.

119 Basildon Council is already committed to effective energy conservation, reduction of greenhouse gases and effective use of resources.

120 Indeed it has historically undertaken a number of actions such as the ones regarding its assets listed in the January 2010 KLOE 3.1 report ⁽¹⁷⁾:

- Effective use of resources within the Council's assets:
 - The Council's Strategic Improvement Plan includes a key objective E2.2 "Improving environmental impact within the Borough".
 - The Asset Management Plan 2009/2010 introduced energy efficiency as a performance indicator for its building portfolio.
 - The Council has taken actions to reduce its use of natural resources and hence lower costs. Campaigns spearheaded by the Council's Building

Control Services have been run over years, for example "Get unplugged" and the previously reported National Performance Indicators (NIs) including NIs 185, 186, 188, 194 ⁽¹⁸⁾ have also driven the Council to look in greater depth at its use of natural resources.

- Energy conservation and reduction of greenhouse gases⁽¹⁹⁾:
 - Eleven major sites are monitored by Half Hourly Metering. This enables the usage profile to be established and the supply matched better to demand, which is more efficient and enables the tendering to be more competitive.
 - Solar water heating arrays installed in Pitsea swimming pool and the transport depot showers at Barleylands.
 - An ongoing Council programme of phasing-in extra roof insulation to a number of large buildings, all within existing resources.
 - The Council has set its own targets for the 'Climate Change' NPI's including one for NI 194⁽²⁰⁾ to annually reduce emissions by 2%.
 - The SportingVillage which opened in April 2011 has been built to BREEAM "very good" standard.
 - Purchasing 10% of electricity from renewable sources (was below 1% previously).
 - Carbon Trust were commissioned to provide general energy efficiency advice on larger buildings (Basildon Centre, Pitsea Swimming Pool and the

15 Environment Agency - Thames Gateway State of the environment report - October 2010.

16 1 megawatt (MW) = 1 million watts; 1 gigawatt = 1 billion watts or 1,000 megawatts. Watts per hour (Wh): unit of energy equal to the power of 1 watt operating for 1 hour.

17 KLOE: Key Lines Of Enquiry.

18 Although the National Indicator Set stopped on 31st March 2011, data collections for NI185 and NI186 continue.

19 KLOE 3.1 Report, January2010: actions undertaken prior to January 2010.

20 NI194 Air Quality - % reduction in NOx and primary PM10 through local authority's estate operations.

Towngate Theatre). The survey concluded that if all the measures were implemented, then savings could be generated. A report is currently being produced to look at the cost-benefit analysis of these proposals.

- A woodchip Biomass boiler with an energy capacity of 240 kW installed at the Wat Tyler Centre. Although it is being used to heat two buildings, the boiler has the capacity for heating three.
- The Motorboat Museum at the Wat Tyler Centre is being replaced by a new community facility, the Green Centre. This "new facility would provide education on the environment and the reduction of carbon [and] also have a focus on....The new sustainable technologies that would define the future of the town".⁽²¹⁾ A woodchip Biomass boiler with an energy capacity of 160kW has also been installed in this facility. Although only half of the museum has been developed, the boiler has the capacity for heating the whole building. The Green Centre has two solar panels with sufficient capacity to heat water when the boiler is not used.
- Both the Wat Tyler Centre and the Green Centre have passive ventilation which allows vents and windows to open and close depending on the temperature.
- The Borough has a strong expertise in terms of installing renewable energy technologies, with companies specialised in the installation of solar panels or wind turbines.
- Through the Basildon Green Business Forum (BGBF), the Council aims to promote environmental awareness and best practice, and

provide help and advice on environmental issues to businesses within the Borough. The objective of the forum is to address issues such as energy consumption and ways of reducing it; the use of natural resources; how to minimise waste; and environmental legislation. A major part of the BGBF's programme is the reduction of CO₂ emissions and, through the forum, grants of up to 40% of capital costs are available from the European Regional Development Fund (ERDF) to help achieve this. Organisations in Basildon have been helped by the BGBF to embrace technologies that help the environment and also to help reduce costs. Examples of this are: food and wood waste to energy, solar powered chargers for electric vehicles and promoting renewables.

- New Cranes Court in Church Road, Basildon will welcome in February 2012, a new housing development, the design of which has been influenced by the requirement to achieve carbon neutral housing. The development is designed to be a Level 6 Code for Sustainable Homes. The space heating and hot water will be obtained from a Combined Heat and Power (CHP) unit housed in a community plant room.

121 Indicators and Energy generation capacity in the Borough.⁽²²⁾

- CO₂ Emissions: in 2008, the average per capita emissions for Basildon Borough was approximately 7 tonnes (compared to 7 tonnes for the Thames Gateway and 8.2 tonnes for the UK). And the breakdown by source of CO₂ emissions for the Borough was as follows:
 - Around 500 kilotonnes for Industry and Commercial (43% total of the total emissions)

21 Cabinet Minute 703.

22 ThamesGatewayState of the Environment Report: Final Draft, Climate Change chapter p.13, Environment Agency (October 2010) and East of England Renewable Energy Statistic, December 2009.

- Around 400 kilotonnes for Domestic (33% total of the total emissions)
- Around 300 kilotonnes for Road transport (24% total of the total emissions)
- In 2008, the per capita gas and electricity consumption for the Borough was between 10,000 and 12,500 kWh (compared to 14,800 kWh for the Thames Gateway and 26,000 kWh for the UK).
- In 2006, the fuel poverty level in Basildon was just above 6% (compared to 7.8% for the Thames Gateway, 9.7% for Essex and 12% for the UK).
- Biomass using technology: Courtauld Road, Basildon - Material Recovery Facility/Mechanical Biological Treatment (MRF/MBT) facility with Anaerobic Digestion and Combined Heat and Power (CHP) plant; capacity of 4.4 MW - planning application approved in July 2008.
- Pitsea Methane Conversion Plant (is a Landfill Gas scheme accredited for the Renewable Obligation, with an installed generating capacity of 12 MW).

National Indicator 187 previously measured progress in tackling fuel poverty through the improved energy efficiency of households. Energy efficiency of a house can be measured by the Standard Assessment Procedure (SAP), which calculates the typical annual energy costs and CO₂ emissions for heating and lighting. SAP is being used as a proxy for fuel poverty in households of people claiming income based benefits, given the link between income poverty and fuel poverty. Houses are rated from 0 to 100; 0 being very inefficient and 100 being highly efficient.

Comparison between data suggested that local authorities with a high proportion of people living in housing with a high SAP rating tend to have a lower overall level of fuel poverty in their borough, which is Basildon's case.

- Code for Sustainable Homes: between April 2007 and December 2010, the number of Code for Sustainable Homes certificates issued was 309 at design stage, 53 at post construction stage.
- Potential for renewable energy in the Borough:

Drivers for Change

- 122** As established earlier in this topic paper, the areas where planning policy can influence the resilience to climate change include: managing high temperatures; managing flood risk; and managing water resource and water quality.
- 123** The following sets out the key matters driving the need for change in the Borough to ensure it grows in a manner that is resilient to the effects of a changing climate.

Contributing to the reduction in Greenhouse gas emissions.

- 124** It has been established earlier that to ensure that global temperatures do not rise more than 2°C, it is critical to reduce greenhouse gases emissions now and in the future, whilst altering our behaviours in order to adapt to the effects of a changing climate.
- 125** Over the years, the Council has been undertaking a number of actions and initiatives regarding improving energy conservation, reducing greenhouse gases and effectively using natural resources.
- 126** However, these actions have been focused on the Council's property assets and services, or on limited/selective projects and do not relate to an overall strategy to reduce the Borough's emissions or a

“framework that promotes and encourages renewable and low carbon energy generation”.⁽²³⁾

127 Moving ahead to reduce the Borough’s emissions, there will be a need to undertake an Energy and Low Carbon Study that will allow:

- A better understanding of the current situation regarding energy consumption and demand in the Borough and what it could be like in the future, in order to be able to set localised targets for carbon emission reduction.
- A better understanding of the feasibility and potential for localised renewable energy generation.
- To take into consideration the measures included in the Green Deal.

Managing and mitigating against flood risk.

128 The SFRA Levels 1 and 2 (June and September 2011) recommend:

- Applying the Sequential Test using the Level 1 SFRA results when selecting the most appropriate areas of the Borough for development in the Core Strategy and any specific sites in the LDF Site Allocations document.
- The examination of the impacts of potential strategic flood defences to inform the LDF and emergency planning procedures.
- To illustrate Flood Zone 3b, as defined by the Level 1 SFRA on the Proposals Map which will accompany the version of the Core Strategy at the submission stage.
- Where development has to be located in areas at risk of river flooding, the safety of the proposed development should be determined and it should be established that the proposed development does not increase flood risk to surrounding areas or impact upon the ability of Basildon Borough Council and the emergency services to safeguard the population.

- In addition, for all future development in the borough, particular attention needs to be paid to the risk of surface water flooding, and in particular the need to ensure that the proposed development does not increase flood risk to surrounding areas or impact on the ability of the Borough’s washland system to perform its function as designed. Specific guidance has therefore been developed for the Borough relating to the use and maintenance of Sustainable Drainage Systems (SuDS).
- The Basildon Borough Surface Water Management Plan (currently being prepared) will help to ensure a holistic approach to surface water management is undertaken by all authorities and agencies in the future.
- A Flood Risk Asset Register, listing the responsibilities for flood defences, is also being prepared and will be managed by Essex County Council.
- There are several recommendations which align with requirements of PPS25, which are applicable for the Basildon Borough in general, its flood management washlands and the Rivers Crouch, Wid and Thames. These can be taken forward in Core Strategy and Development Management DPDs, Flood Risk Assessments, Building/ Scheme Design, Emergency Plans and Sustainable Drainage Systems.

129 Following these recommendations will allow the Council to:

- Reduce the vulnerability of the Borough to surface water run-off; and
- Reduce the risk of flooding in the Borough.



Develop robust policies for ensuring development does not detract from the achievement of water quality improvement.

- 130** Scenario modelling has shown that supply is currently insufficient to meet the demand and with no action the deficit will worsen as a result of increased demand and climate change. The Ely-Ouse scheme which will help meet the future demand for water resource, will only be in place in 2014. Until then, South Essex will be deficient in water during drought years and this means that development phasing up to 2014 will need to be appropriately managed so that it does not exacerbate the problem.
- 131** It is particularly important that water efficiency measures are incorporated into development schemes. Increased water efficiency will directly reduce consumer water and energy bills and reduce carbon dioxide emissions.
- 132** Also the draft South Essex Outline Water Cycle Study (2011) recommends that, in order to improve water efficiency and make the most sustainable use of the County's limited water resources, more stringent water consumption policies equivalent to Code for Sustainable Homes 3/4 be put in place for development in the Borough.
- 133** The South Essex Outline Water Cycle Study (2011) also recommends the implementation of measures to ensure that developments do not physically disturb an aquifer or affect abstracted water resources.

Making buildings more resilient to a changing climate.

- 134** Building, maintaining and occupying homes accounts for almost 50 per cent of the UK's carbon dioxide emissions. New developments provide an excellent opportunity to build homes and offices that are better for the environment and have cheaper running costs.
- 135** Development should seek to minimise the use of resources by incorporating, for example, passive systems using natural

light, air movement and thermal mass, as well as using energy produced from renewable sources.

- 136** Location and density for homes and communities are key issues in determining energy demands. Building Regulations and sustainability standards are ways to improve energy performance of buildings, but not to the extent that they will combat climate change and make the best use of energy supplies.
- 137** Sustainable design solutions could be implemented to help reduce energy demand through passive efficiency measures, such as use of solar energy, passive heating/cooling and natural light/ventilation in the design and orientation of developments, better insulation, low-energy fittings and appliances.

Harness the Region's leading role in encouraging low carbon related industries and support industries to locate in the Borough.

- 138** It has already been stated earlier in this report that the the market value of low carbon environmental goods and services in the region, for 2008/09, was £12.86 billion, around 9% of the UK market, with 6,200 companies employing around 103,000 people.
- 139** Also organisations in the Borough have been helped by the Basildon Green Business Forum (BGBF) to embrace technologies that help the environment and help reduce costs.



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