

Sustainable Development and Climate Change Background Paper

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GOSPORT
Borough Council

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1.0 INTRODUCTION

- 1.1 This document is an initial version of the background paper to the Gosport Borough Local Plan 2038 (GBLP2038). It sets out the relevant national and local policy context and a summary of an initial review of evidence on this matter. Further work will be included once representations have been received on the draft policies and proposals as part of the consultation process of the draft GBLP2038 (Regulation 18 version)

2.0 POLICY CONTEXT

National Policy and guidance

National Planning Policy Framework (MHCLG 2021)

- 2.1 The achievement of sustainable development is an integral part of the planning system, with the National Planning Policy Framework (NPPF) defining sustainable development in accordance with Resolution 42/187 of the United Nations General Assembly, which considers it to be:

“meeting the needs of the present without compromising the ability of future generations to meet their own needs”

- 2.2 The NPPF states that the purpose of the planning system is to contribute to the achievement of sustainable development, which comprises the interdependent economic, social and environmental objectives, which are:

- **an economic objective** – to help build a strong, responsive and competitive economy, by ensuring that sufficient land of the right types is available in the right places and at the right time to support growth, innovation and improved productivity; and by identifying and coordinating the provision of infrastructure;
- **a social objective** – to support strong, vibrant and healthy communities, by ensuring that a sufficient number and range of homes can be provided to meet the needs of present and future generations; and by fostering well-designed, beautiful and safe places, with accessible services and open spaces that reflect current and future needs and support communities' health, social and cultural well-being; and
- **an environmental objective** – to protect and enhance our natural, built and historic environment; including making effective use of land, improving biodiversity, using natural resources prudently, minimising waste and pollution, and mitigating and adapting to climate change, including moving to a low carbon economy.

- 2.3 These objectives are considered to be interdependent, and should be pursued in mutually supportive ways, so that net gains can be secured across each of the different objectives.

- 2.4 To help achieve this approach, the NPPF applies the ‘presumption in favour of sustainable development’. This is defined as having plans and decisions which ‘positively seek opportunities’ to meet development needs, and are sufficiently

flexible. This includes meeting an areas objectively assessed needs for housing delivery, as well as the unmet housing needs of neighbouring authorities, unless there is a 'strong reason' for restricting development, or the impacts would outweigh the benefits, as defined by the NPPF. The presumption in favour of sustainable development also applies where a local plan is considered to be 'out-of-date'. This occurs where an authority cannot demonstrate a five year housing supply, has failed the Housing Delivery Test, or where a local plan has not been reviewed within five years of adoption.

- 2.5 The NPPF provides a dedicated section on climate change entitled 'Meeting the challenge of climate change, flooding and coastal change'. The section states how the planning system should 'support the transition to a low carbon future in a changing climate', including shaping places to deliver 'radical reductions in greenhouse gas emissions', and supporting 'renewable and low carbon energy and associated infrastructure'.
- 2.6 Paragraph 153 requires plans to take a proactive approach towards mitigating and adapting to climate change. This includes taking into account the long-term implications of flood risk, coastal change, water supply, biodiversity, landscapes, community resilience and the risk of overheating. It also includes ensuring that risks can be managed through suitable mitigation measures, such as providing space for physical protection measures, planning for green infrastructure, or making provision for the reallocation of vulnerable development and infrastructure.
- 2.7 The location, orientation and design of developments should seek to reduce greenhouse gas emissions. Local standards for the sustainability of buildings must however reflect the Government's national technical standards policy.
- 2.8 The NPPF goes on to say that plans should include a positive strategy to maximise the use and supply of renewable and local carbon energy and heat, including supporting community-led initiatives. Furthermore, when determining applications for renewable or low carbon energy, local planning authorities should not require applicants to demonstrate the need for the project, as even small-scale projects can provide a valuable contribution.
- 2.9 Green infrastructure has an important role in both mitigating and adapting to climate change. As defined by the NPPF, green infrastructure (GI) is 'a network of multi-functional green space, urban and rural, which is capable of delivering a wide range of environmental and quality of life benefits for local communities.' The Planning Practice Guidance expands on this, defining GI as 'parks, playing fields, other areas of open space, woodland allotments, private gardens, sustainable drainage features, green roofs and walls, street trees and 'blue infrastructure' such as streams, ponds, canals and other water bodies.'¹ The TCPA add to this definition by including soils too.²
- 2.10 The NPPF recognises that GI can play an important role in mitigating climate change through contributing to carbon storage, providing cooling and shading, reducing flood risk, and protecting biodiversity, water quality and other natural resources. Well-designed GI can also encourage people to travel in a more sustainable way, such as walking and cycling.

¹ www.gov.uk/guidance/natural-environment#green-infrastructure

² www.tcpa.org.uk/green-infrastructure-definition

Planning Practice Guidance (MHCLG 2021)

- 2.11 The online Planning Practice Guidance (PPG) provides further detail to the NPPF, including providing additional guidance on protecting the environment and climate change, including advising on how to identify suitable mitigation and adaptation measures.

Environment Bill (UK Parliament, pending)

- 2.12 The Government has been preparing a new Environment Bill, setting out how the UK's green standards and environmental protection will be shaped after exiting from the European Union. The Bill includes a number of wide-ranging changes, which includes the introduction of a mandatory 'biodiversity net gain' requirement for developments. It is envisaged this will be a 10% gain on the site's existing biodiversity value, according to a prescribed metric. The protection and enhancement of habitats would also be supported through Nature Recovery Network, which would establish Local Nature Recovery Strategies, and giving communities a greater say in the protection of local trees.

25 Year Environment Plan (DEFRA 2020)

- 2.13 The 25 Year Environment Plan for England sets out government action to help the natural world regain and retain good health. It aims to deliver cleaner air and water in our cities and rural landscapes, protect threatened species and provide richer wildlife habitats. With regard to GI, the 25 Year Environment Plan intends to:
- embed an 'environmental net-gain' principle for development, including housing and infrastructure;
 - draw up a national framework of GI standards;
 - 'green' towns and cities by creating more GI;
 - reduce the risk of harm from flooding and coastal erosion including greater use of natural flood management solutions;
 - help people improve their health and wellbeing by using green spaces including through mental health services.

Best Practice and Standards

BREEAM Communities (BRE 2012)

- 2.14 In 2012 the UK's Building Research Establishment (BRE) released the BREEAM Communities guidance, which provides a framework to masterplan large-scale developments to be good to live and work in, be economically successful, and are good for the environment.
- 2.15 The BREEAM Communities Technical Manual provides a framework for developers to achieve different 'BREEAM Ratings', by choosing the most appropriate design solutions to deliver economic, social and environmental gains for their development.
- 2.16 There are six categories through which BREEAM Communities is assessed. Assessment credits are available in each of the categories with a combination of mandatory credits and additional credits being available. In addition, the categories are afforded different weightings for scoring, as highlighted below:

- **Governance (9.3%):** Promotes community involvement in decisions affecting the design, construction, operation and long-term stewardship of the development.
- **Social and economic wellbeing (42.7%):** Considers societal and economic factors affecting health and wellbeing such as inclusive design, cohesion, adequate housing and access to employment.
- **Resources and energy (21.6%):** Addresses the sustainable use of natural resources and the reduction of carbon emissions.
- **Land use and ecology (12.6%):** Encourages sustainable land use and ecological enhancement.
- **Transport and movement (13.8%):** Addresses the design and provision of transport and movement infrastructure to encourage the use of sustainable modes of transport.
- **Innovation:** Recognises and promotes the adoption of innovative solutions within the overall rating where these are likely to result in environmental, social and/or economic benefit in a way which is not recognised elsewhere in the scheme.

2.17 When scored against the above six categories, as long as all of the mandatory credits are achieved, developments can score the following BREEAM ratings based on the number of credits available:

BREEAM Rating	% score
Outstanding	85
Excellent	70
Very good	55
Good	45
Pass	30
Unclassified	Under 30

BREEAM UK New Construction (BRE 2018)

2.18 The Building Research Establishment launched the Home Quality Mark (HQM) in 2015 as a simple to use trust mark for homebuyers assess a home's running costs, health and wellbeing benefits, and environmental impact. The mark enables developers to showcase the quality of their homes to councils, homebuyers and tenants.

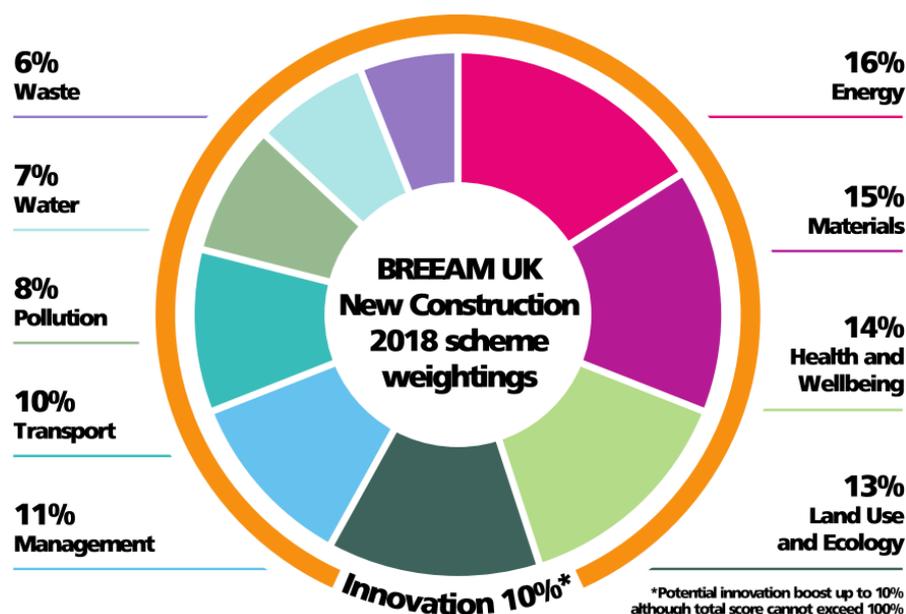


Figure 1 - credit weight in BREEAM UK New Construction

Home Quality Mark ONE (BRE 2015)

2.19 In March 2014, the Government announced plans to withdraw Code for Sustainable Homes (CfSH) and consolidate parts of it within building regulations. With the phasing out of the CfSH, in 2015 the BRE launched a new standard called the Home Quality Mark (HQM). Although both have been developed by the BRE, the HQM should not be considered as a successor to the CfSH. Instead, it is an optional standard which provides homebuyers with a rating system for:

- **Running costs** - a home's overall living costs (covering typical energy bills, maintenance and access to local shops and services);
- **Health and wellbeing** - how the home will affect the occupier's health and wellbeing (level of VOCs and other air pollutants, natural light, noise insulation etc.);
- **Environmental impact** - The environmental impact of the construction and occupation of the dwelling, including whether it protects and enhances ecology.

Passivhaus Standard (Passivhaus Trust 2020)

2.20 Passivhaus is a building design standard developed by the Passivhaus Institute in Germany. The standard aims to increase the thermal and air comfort of occupiers while reducing heating and cooling bills. Typically, Passivhaus buildings are orientated to maximise solar gain during the winter months, while reducing solar heating during the summer. This approach is supplemented through high efficiency windows and insulation, which together reduce the need (often to negligible levels) for artificial space heating or cooling. The use of natural ventilation is also maximised through Passivhaus design, however mechanical ventilation with heat recovery is incorporated.

2.21 Along with enhanced comfort, Passivhaus design carries a number of other advantages, those being significantly reduced running costs (space heating

accounts for the majority of energy use within the average UK dwelling³), as well as radically reduced environmental impacts. They also provide wellbeing benefits to occupiers through plentiful levels of natural light and fresh air.

2.22 The delivery of the 'Passivhaus Standard' is achieved through the application of a number of key design principles, which are:

- accurate design modelling using the Passive House Planning Package (PHPP);
- very high levels of insulation;
- extremely high-performance windows with insulated frames;
- airtight building fabric;
- 'thermal bridge free' construction;
- a mechanical ventilation system with highly efficient heat recovery.

2.23 The addition of Passivhaus principles to the average UK build costs were estimated to be up to 15% in 2012⁴. More recent estimates have put the figure at only 5%, or in some cases even negative. The financial (and environmental) savings achieved through the lifetime of a Passivhaus however significantly outweigh an additional build cost. On this basis, the adoption of Passivhaus principles should be supported within the Gosport Borough Local Plan 2036.

Sub-Regional Policy

PUSH Spatial Position Statement (PfSH 2016)

2.24 The Partnership for South Hampshire (PfSH) has produced a number of documents and studies on sustainability or which refer to it. This includes the PUSH Spatial Position Statement (2016), which discusses the need for 'sustainable economic growth' supported by key infrastructure including transport, utilities and green infrastructure which promote sustainable development.

2.25 The Spatial Position Statement includes a section on GI, which is considered to be 'crucial' to enable sustainable economic growth. The document recognises that multifunctional GI provides many benefits including adaption to climate change.

2.26 The document includes the Policy G1: Green Infrastructure, which sets out the requirements for PUSH authorities and partners to plan for and manage a connected network of multi-functional green spaces, including enhancing country parks (such as the Alver Valley) and long distance routes (such as the Solent Way), and making coastal/seafront improvements. The policy goes on to say that each authority will make provision for strategic and local GI within their local plans, utilising NE's ANGSt, as appropriate.

³

https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/386858/Estimates_of_heat_use.pdf

⁴ <https://www.bere.co.uk/assets/NEW-r-and-d-attachments/Larch-and-Lime-Houses-Passivhaus-Cost-Comparison-2012.pdf>

PUSH South Hampshire Green Infrastructure Strategy 2017-2034 (PfSH 2017)

- 2.27 The Green Infrastructure Strategy considers that the delivery of high quality multifunctional green infrastructure (GI) is essential to sustainable economic growth in South Hampshire. This includes providing GI to deliver health and wellbeing benefits and offsetting the recreational impacts of development. GI can also be used to implement SuDS for flood mitigation and water management, and to adapt to climate change. This includes maximising the use of GI to improve air quality and improving spaces to encourage people to travel in a more sustainable way, such as walking and cycling.
- 2.28 The report recognises the need to promote new GI to offset the recreational impacts associated from planned growth and development on sensitive areas by providing alternative high quality natural greenspace or other accessible GI features, preferably within new developments or existing communities.
- 2.29 Natural England provides a standard for the provision of both local and strategic-level GI, referred to as the Accessible Natural Greenspace Standards (ANGSt). The strategy makes use of the standard and recommends that everyone should have accessible natural greenspace:
- of at least 2 hectares in size, no more than 300 metres (5 minutes' walk) from home;
 - at least one accessible 20 hectare site within two kilometre of home;
 - one accessible 100 hectare site within five kilometres of home; and
 - one accessible 500 hectare site within ten kilometres of home; plus
 - a minimum of one hectare of statutory Local Nature Reserves per thousand population.
- 2.30 Figure 15 of the document showed that Gosport is well served by the Alver Valley Country Park, which is 100 hectares or more, while Figure 14 illustrated that the majority of the Borough was just outside of the 10km range for a strategic countryside facility of 500 ha or more. As such, there may be a need to provide additional GI within, or close to Gosport.
- 2.31 A core principle of PfSH's approach towards delivering GI is multi-functionality, which is the ability to deliver a range of ecosystem functions that benefit people and the environment. Street trees for example, reduce air pollution, the urban heat island effect and wind turbulence, but also improve biodiversity and add aesthetic quality to a townscape. Well-designed GI can also encourage people to travel in a more sustainable way, such as walking and cycling, which has additional health, noise and air quality benefits. Gosport is well-placed to benefit from additional walking and cycling routes.

PUSH Strategic Flood Risk Assessment (PfSH 2016)

- 2.32 The update to the SFRA, and its accompany Guidance Document considers that climate change poses a significant flood risk to the sub-region. In particular, it recognises that Gosport is already constrained by flood risk, with 33 km of coastal frontage, 5 km of rivers, and approximately 21% of the Borough being within Flood Zones 2 and 3.
- 2.33 The report states that inundation caused by climate change could be 'dramatic' in very flat areas around the coast (such as Gosport). The impact of climate

change on increasing sea levels is likely to have a significant effect on the extents of Flood Zones 2 and 3 by 2115, especially on Portsmouth Harbour frontages. In light of climate change forecasts the SFRA considers that higher flood defence standards may be appropriate. To sustain future development in Gosport, particularly in areas of high risk, significant investment in flood defences will be required.

- 2.34 The report also anticipates that climate change will result in an increase in fluvial flood flows. This may put pressure on areas such as Rowner where properties are adjacent to the River Alver floodplain.
- 2.35 The NPPF states that local authorities should prepare and implement planning strategies which help to deliver sustainable development by using opportunities offered by new development to reduce the causes and impacts of flooding, such as through requiring developers to provide SuDS and other on-site flood mitigation measures, flood management plans, and developer contributions towards sea defence improvements, where required.
- 2.36 Since the report was commissioned, the Eastern Solent Coastal Partnership (now Coastal Partners), of which GBC is a member, has received significant amounts of funding towards enhancing local flood defences. Further information on this funding can be found within the Council's Infrastructure Funding Statement (2020)⁵. Notwithstanding, a significant sea defence funding deficit still exists, particularly in some of the regeneration areas, which will require additional developer contributions.

PfSH SFRA (pending 2022)

- 2.37 The PfSH authorities have commissioned consultants to undertake a new SFRA for the PfSH area. This new work will take on board recent climate change allowances and new modelling accordingly. The study is expected to be finalised over the winter and spring of 2022 and will inform a further iteration of the Council's SFRA.

Hampshire County Council Climate Change Strategy (HCC 2020)

- 2.38 Hampshire County Council declared a climate emergency in June 2019 and adopted a climate change strategy⁶ the following year. The strategy aims for HCC and its partners to provide leadership and embed climate change mitigation and resilience into all key policy areas.
- 2.39 This will require a step change in lifestyles, policies strategies and investment decisions across all levels of our society. This includes:
- “building new sustainable homes by utilising the and encouraging the use of sustainable building materials, reducing and conserving energy and water, reducing waste, using local and sustainable energies, investing further in sustainable transport options and developing natural flood management systems.”
- 2.40 The Strategy is based on a series of principles, one of which is the carbon hierachy (shown below), as well as achieving 'co-benefits', such as reducing

⁵ www.gosport.gov.uk/infrastructure

⁶ <https://documents.hants.gov.uk/environment/Hampshire-Climate-Change-strategy-2020-2025.pdf>

congestion (improving air quality and health and economic growth). Other principles include: Proportionate, Affordable, Equitable; Accelerate Where Appropriate; Policy and Funding; and Digital and Innovation.

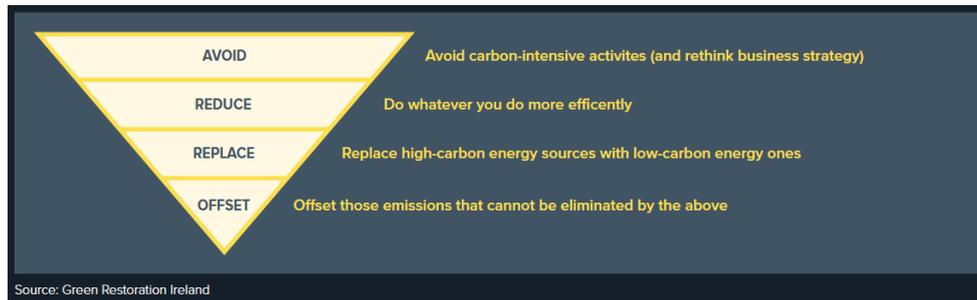


Figure 2 - Carbon Hierachy (source: HCC Climate Change Strategy 2020)

2.41 Tackling transport emissions is one of the priorities for the strategy, including increasing the update of walking, cycling and public transport, and promoting EVs. Supporting a reduction in residential and building and infrastructure emissions are other priorities, such as through reducing energy usage, increasing energy efficiency and switching to whole-life cycle construction, and low carbon/renewable energy. Local Plans are specifically mentioned as a supporting strategy in achieving this priority.

2.42 Other strategic priorities are:

- Building and Infrastructure;
- Energy Generation and Distribution (supporting renewable and low carbon energy production);
- Waste and Circular Economy (driving waste reduction and an increase in reuse, repair and recycling);
- Natural (maximising opportunities to increase habitats, landscapes and biodiversity);
- Business and Green Economy (actively promote green growth).

2.43 The Borough Council will look to work with HCC to help deliver these priorities, including embedding the principles within the Local Plan, where possible.

Local Policy

Gosport Borough Council's Climate Change Strategy 2020-2023 (GBC 2020)

2.44 The Borough Council recognises that climate change poses a major threat to our long-term prosperity and well-being. In 2019 a cross-party Climate Change Working Group was set up, which developed the Council's Climate Change Strategy 2020-2023⁷, which will be supported by an annual action plan. The strategy includes a target for the Council to become carbon neutral in its own operations by 2050 or sooner, as well as encouraging residents and businesses to support and adopt carbon neutral measures.

2.45 Within the strategy the Council recognises its role of helping to tackle climate change in a number of key areas, which are:

⁷ www.gosport.gov.uk/media/2996/Climate-Change-Strategy/pdf/Climate_Change_Strategy.pdf?m=637504572928470000

- **Planning Authority** – promoting through the local plan, sustainable communities, low carbon lifestyles and higher environmental standards with greater resilience to climate change.
- **Policy Maker** – making mitigation and adaption to climate change central to strategies, policies and plans.
- **Community Leader** – working in partnership, promoting a low carbon economy, low carbon lifestyles and resilience to climate change.

2.46 Government figures referenced in the Climate Change Strategy show that between 2005 and 2017 carbon emissions in the Borough fell from 378 kt CO₂ to 227 kt CO₂, a fall of around 40%. With a per capita emission rate of 2.27 t, Gosport's emissions are now significantly less than other Hampshire authorities, and less than the majority of local authorities in the UK. The fall follows a national pattern of a 38% reduction in carbon emissions, primarily due to a reduction in the use of coal for electricity, greater fuel/electricity efficiency, and reduced travel.

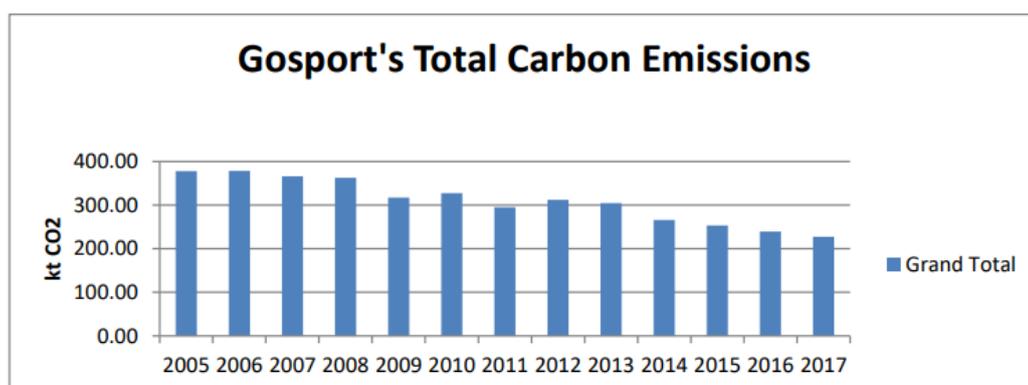


Figure 3 - Gosport's Total Carbon Emissions (GBC Climate Change Strategy 2020-2023)

2.47 The Climate Change Strategy sets out the Council's key areas of focus for tackling climate change, which are:

- Reducing its carbon emissions and carbon footprint;
- Promoting sustainable communities, flood risk, low carbon lifestyles, encouraging higher environmental standards, improving biodiversity, increasing green infrastructure and securing resilience to climate change;
- Working in partnership to encourage residents and businesses to support and adopt measures towards the goal of carbon neutrality;
- Working with Hampshire County Council, Hampshire district councils, the wider public sector and businesses to procure support, best practice, coordination, legislative change and funding as appropriate to support plans of action for Gosport.

2.48 An action plan will be developed alongside this strategy to help direct the Council on how to reduce the Borough's carbon footprint. The action plan will be refreshed annually, underpinned by a number of other plans and strategies, including the local plan process.

Gosport Profile – Climate Change (GBC 2021)

- 2.49 The Gosport Profile provides an overview of social, economic and environmental information for Gosport Borough, using the latest available statistics from a variety of national and local sources. The Profile provides information to support the Council's policy documents such as the Local Plan and forms the baseline information for the Sustainability Appraisal.
- 2.50 The Profile shows that between 2005 and 2017, CO² emissions in Gosport fell by approximately 40%, while per capita emissions fell by 44% over the same period, mostly due a transition from coal to gas power generation at the national level⁸.

Council 'plan on a page' (GBC)

- 2.51 The Council's 'plan on a page' has being 'ambitious', 'adaptable' and 'efficient' as three of its five core values⁹. In addition, one of the five strategic priorities for the borough is 'enhancing the environment'.
- 2.52 The delivery of sustainable development and climate change mitigation and adaption through the Local Plan, will therefore assist the Council in achieving these core aims.

⁸ https://www.gosport.gov.uk/media/2901/2-Climate-Change/pdf/2.Climate_Change.pdf?m=637455393832600000

⁹ https://www.gosport.gov.uk/media/2221/Council-Plan/pdf/GBC_Plan_On_A_Page_summary.pdf?m=637000090856130000

3.0 EVIDENCE

Overview

- 3.1 All of the evidence produced for the emerging GBLP2038 is in some way relevant when considering sustainability issues. To avoid duplication much of this evidence is considered in more detail as part of other more specific background papers. This background paper provides a consideration of key evidence studies that will be particularly relevant for cross-cutting sustainability issues.
- 3.2 The section below outlines key evidence and other supporting information produced at a national level to justify the approach the Borough Council is taking on a number of issues relating to sustainability including climate change in the GBLP2038. Where relevant, the section also includes sub-regional evidence for example in relation to energy consumption.

Sustainable development

- 3.3 There are multiple definitions of what constitutes sustainable development, however the most commonly used definition is from the 1987 World Commission on Environment and Development (otherwise known as the Brundtland Report), which is:

“Humanity has the ability to make development sustainable to ensure that it meets the needs of the present without compromising the ability of future generations to meet their own needs.”

- 3.4 This is the definition of sustainable development which is adapted for use within the National Planning Policy Framework (NPPF) and most other UK Government publications. The NPPF builds upon this definition by emphasising the links between the overlapping social, economic and environmental aspects of sustainable development, which is considered should be pursued concurrently.
- 3.5 The GBLP2038 includes a number of elements which together form a strategy to mitigate and adapt to climate change. Key elements of this strategy include:
- Regenerating brownfield sites to improve social and economic conditions, while reducing the pressure on greenfield development.
 - Increasing densities within sustainable locations, such as the Town Centre and Waterfront Regeneration Area, and as Haslar Peninsula.
 - Locating development near existing built-up areas to support sustainable modes of travel (walking, cycling and public transport) and make local shops and services more viable.
 - Ensuring development is built to the highest possible sustainability standards, including adopting Passivhaus standards. This will help to promote sustainable material use and waste reduction, as well as driving higher living standards.
 - Adopting a residential water efficiency standard of 100 litres per person per day, in line with Southern Water’s ‘target 100’. This standard exceeds the mandatory national standard of 125 litres per person per day, and the optional requirement of 110 litres per person per day. This target will

improve water resilience and reduce customer bills, as well as helping to reduce the discharge of nutrients into the Solent.

- Achieving a reduction in the carbon emissions of residential dwellings of at least 19% compared to the Target Emission Rate of Part L of the Building Regulations.
- Managing flood risk to direct developments away from areas at risk, and ensuring flood risk management measures are in place where risks remain, including incorporating Sustainable Urban Drainage Systems (SUDS) wherever possible.
- Green infrastructure is protected and enhanced to both mitigate and adapt to the effects of climate change, while supporting biodiversity which will also be impacted by climate change.

Climate Change

- 3.6 There is considerable research showing that human activity is changing the world's climate and that the impacts will be extremely significant to all life on this planet.

Fifth Assessment Report (IPCC 2014)

- 3.7 The International Panel on Climate Change (IPCC) finalised its Fifth Assessment Report in 2014¹⁰. This updated its previous Fourth Assessment Report from 2007 with the new report synthesising the latest evidence and a more comprehensive approach.

- 3.8 The key findings from the Fifth Assessment Report were the following¹¹:

- Human influence on the climate system is clear, and recent man-made emissions of greenhouse gases are the highest in history.
- The atmosphere and oceans have warmed, the amounts of snow and ice have reduced, sea level has risen, the oceans have become more acidic and some extreme weather events have intensified.
- Without substantial efforts to curb greenhouse gas emissions, global temperatures by the end of the 21st century could be more than 4 °C above what they were before the Industrial Revolution.
- A change of that size would very likely lead to severe, widespread, and irreversible impacts on societies and the environment globally.
- We can adapt our societies to prepare for some of the risks of climate change and this is essential, but this alone is not enough. Therefore we need to significantly reduce greenhouse gas emissions to limit the scale of climate change.
- There are many options to reduce emissions, including the use of low carbon energy sources such as wind, solar and nuclear; the removal and burial of carbon dioxide where fossil fuels are still used; and the more efficient use of energy. Notwithstanding this, the scale of change required will pose significant technological, economic, social and institutional challenges, and the longer we wait to implement them, the bigger these will become.

¹⁰ <https://www.ipcc.ch/assessment-report/ar5/>

¹¹ <https://www.gov.uk/government/publications/ipcc-5th-assessment-report-synthesis-report/key-points-and-questions-ipcc-ar5-synthesis-report>

The Stern Review (HM Treasury 2006)

- 3.9 In 2006 HM Treasury commissioned The Stern Review to assess the economics of climate change. While this report was compiled a number of years ago, its landmark findings are still relevant to planning and viability discussions today.
- 3.10 The Stern Review considered that climate change will affect the basic elements of life for people around the world including access to water and food production. It estimated that climate change would lead to a decline in the quality of human health and the environment, and that as the world warms hundreds of millions of people could suffer from hunger, water shortages and coastal flooding.
- 3.11 Future predictions affecting the UK include higher average temperatures, dryer summers, wetter winters, more extreme weather events, including stormier conditions, and the continued rise in sea level. The Government acknowledges that there will be permanent changes in the natural environment and increasing challenges to national prosperity and social cohesion.
- 3.12 The Review estimates that if we don't act, the overall costs and risks of climate change will be equivalent to losing at least 5% of global GDP each year. If a wider range of risks and impacts is taken in to account, the estimates of damage could rise to 20% of GDP or more. In contrast, the costs of action now, to reduce greenhouse gas emissions to avoid the worst impacts of climate change, can be limited to around 1% of global GDP each year. The investment that takes place over the next 20 years will be crucial.
- 3.13 If no action is taken to reduce emissions, the concentration of greenhouse gases in the atmosphere could reach double its pre-industrial level as early as 2035, resulting in a global average temperature rise of over 2°C. In the longer term there would be more than a 50% chance that the temperature would exceed 5°C. This is equivalent to the change in average temperature from the last ice age to today. Such a radical change in such a small space of time will have tremendous consequences.
- 3.14 The Stern Review's key conclusions were:
- There is still time to avoid the worst impact of climate change if strong action is taken now;
 - Climate change demands an international response.
 - Climate change could have very serious impacts on growth and development;
 - The costs of stabilising the climate are significant and manageable: delay would be dangerous and much more costly;
 - Action on climate change is required across all countries, and it need not cap the aspirations for growth of rich or poor countries; and
 - A range of options exist to cut emissions and strong deliberate policy action is required to motivate their take-up. Measures include reducing emissions:
 - through increased energy efficiency;
 - through changes in demand;
 - through adoption of clean power, heat and transport technologies;
 - through cuts in non-energy emissions such as those resulting from deforestation.

Flood Risk

- 3.15 As a coastal town, consideration of flood risk plays an important role in development decisions in the Borough. The topography of the Borough ranges from sea level to a high of only 12 metres above ordnance datum (mAOD). A major local impact of climate change includes sea level rises, which would have significant social, economic and environmental consequences over the next 100 years. Sea levels along the South East coast are projected to rise over the next 100 years (see Table 1) which given Gosport's coastal location is of particular concern¹². The higher central rise allowance is based on the 70th percentile (exceeded by 30%), while the upper end rise is based on the 95th percentile with a (5% risk).

Table 1: Sea level rise allowances for South East England

Allowance	Net Sea-Level Rise (millimetres per year)				Cumulative rise 2000-2125
	2000-2035	2036-2065	2066-2095	2096-2125	
Higher central	5.7	8.7	11.6	13.1	1.2 metres
Upper end	6.9	11.3	15.8	18.2	1.6 metres

Source: Flood risk assessments: climate change allowances (PPG, 2021)

PUSH Strategic Flood Risk Assessment (2016 Update)

- 3.16 The SFRA¹³ and its accompanying 'Guidance Document: Gosport Borough Council', show that the Borough has 10 km of open coastal frontage and 23 km of harbour frontage, along with 5 km of rivers. In addition, approximately 21% of the Borough's land area is within Flood Zones 2 and 3.
- 3.17 The SFRA has shown that the primary source of flood risk to Gosport is from the sea, with the key locations which are at risk being the frontages around Haslar Creek, Forton Lake, Stokes Bay, and the areas fronting Portsmouth Harbour. With 100 years of predicted sea level rises expected due to climate change, by 2115, many of Gosport's existing coastal defences would fail to protect against a 1 in 20 year event. To sustain future development in Gosport, particularly high risk locations, significant investment in flood defences will be required.
- 3.18 The River Alver also presents flood risks to Gosport. The Study anticipates that climate change will result in an increase in fluvial flood flows, which may put additional pressure on areas such as Rowner where properties are adjacent to the River Alver floodplain. Furthermore, if undefended, tidal inundation along the length of the Alver poses an even greater risk. While the river is currently protected from tidal inundation, residual risks remain should this defence fail. Developments in Flood Zones 2 and 3 of the River Alver catchment should contact the Environment Agency to obtain the latest flood risk information. Flood Risk Assessments should also consider the risk of flooding from localised drainage ditches and channels, where they exist close to a development site.

¹² www.gov.uk/guidance/flood-risk-assessments-climate-change-allowances#table-2

¹³ www.gosport.gov.uk/gbip2038evidence

- 3.19 According to the SFRA, several parts of Gosport are at risk of flooding from surface water. This includes approximately a third of the Borough which lies above a geological band which runs from Priddy's Hard to Brookers Lane in Bridgemary. This northern third lies in an area of predominantly low-permeability bedrock, which has an increased risk of surface water flooding, and which may make Sustainable Urban Drainage Systems difficult to implement. Developments in these areas will need to factor in these ground conditions into their Flood Risk Assessments (FRAs).
- 3.20 Historically, flooding incidents have occurred within some parts of Gosport where drainage infrastructure has failed. The potential for this to occur again, or for new development to have an adverse impact upon the existing local drainage system should be addressed by FRAs for large development sites, in consultation with Southern Water.
- 3.21 The Study has demonstrated that there is sufficient land available in Flood Zone 1 to meet the housing requirements of the Borough in accordance with the Sequential Test, as set out in the NPPF. However certain development in Flood Zones 2 and 3 offer significant regeneration benefits that are not available elsewhere in the Borough and consequently it is necessary for development to meet the Exception Test as set out in NPPF. These issues are covered further in the Council's Interim Strategic Flood Risk Assessment (2021)¹⁴ and the Flood Risk and Coastal Change Background Paper.

Sustainable Construction

Home Quality Mark ONE (BRE 2015)

- 3.22 The emerging GBLP2038 is proposing to use the various sustainable construction standards as set out in Section 2. Further viability work will be required as part of formulating the next stage of the Local Plan.

Renewable Energy and Energy Efficiency

Solent Energy Strategy (PUSH/Future Solent 2015)

- 3.23 In 2015, PUSH and Future Solent commissioned Arup to prepare a Solent Energy Strategy to look at the options and benefits for delivering renewable energy and energy efficiency in the sub region¹⁵. The report found that in 2011 the Solent used just over 26,000 GWh of energy, with the majority coming from fossil fuels; predominantly gas and petroleum. The cost of this energy to the sub-region was calculated to be £1.9bn, equating to 6% of the area's GVA, with costs rising faster than inflation. The largest user of energy is the industrial and commercial sector (42%), followed by domestic (32%) and then transport (26%).
- 3.24 A target of generating 20% of South Hampshire's electricity through renewables by 2020 had been set in Policy 18 of The South Hampshire Strategy (October 2012), which read that:
"20% of all electricity to be generated from renewable sources by 2020 across South Hampshire as a whole, encouraging renewable energy generating

¹⁴ www.gosport.gov.uk/gblp2038evidence

¹⁵ <https://www.push.gov.uk/wp-content/uploads/2018/05/Solent-Energy-Strategy-2015.pdf>

installations/projects and adopting positive planning policies for renewable energy”

- 3.25 The report estimated that the Solent is expected to consume 4,539 GWhs of electricity by 2020, with a 20% share representing 908 GWhs. In 2015, the total pipeline capacity for renewables was 1,129 GWhs, which would exceed the target, however analysis indicated that achieving 3.8-6.3% renewable electricity by 2020 is a more likely target as not all projects will be delivered.
- 3.26 The study identified that between 2005 and 2011, overall energy consumption in the Solent decreased from 32,381 GWhs to 26,006 GWhs. During this period the CO₂ emissions for the Solent also decreased from 9.2 Mt to 7.9 Mt; representing a decrease of 14%. While this does largely indicate the roll-out of energy efficiency and low carbon technologies, it was also a period of economic recession.
- 3.27 The trends for overall energy and carbon decreases are forecast to continue to 2020 and beyond, however a 29.5% increase in demand for electricity is expected between 2014 and 2030. This is partly due to the ‘electrification’ of the commercial sector, such as through increased use of air conditioning units, and also through the anticipated rise in electric vehicles.
- 3.28 For domestic properties, the report shows how relevant factors in the increased energy use of a home are: household income; the number of the rooms; if they are owner-occupied, and the age of the dwelling. With regard to the latter, the least energy efficient properties tend to be those built between 1919 – 1944 and 1945 – 1964, of which Gosport contains a high number of.
- 3.29 For homes, space heating is the most prolific energy use, accounting for 62% of total energy consumption, followed by water heating (18%), lighting and appliances (17%), and cooking (3%). For industrial and commercial businesses, the largest single energy use is process heating (33%), followed by space heating/cooling (31%) and lighting and computing (10%).
- 3.30 The report also showed that an estimated 8.3% of Solent households live in fuel poverty, compared to 10.9% of the national average. This figure however is buoyed by the relative affluence of the South East area, with pockets of deprivation within areas such as Gosport suffering from higher levels of fuel poverty.
- 3.31 The report goes on to list existing energy infrastructure in the Solent area (as of 2011), including renewables, which are displayed below in Table 1. In addition to the 1400 MW Navitus Bay project, which has since been refused permission, the document compiled a list of 60 major energy projects which were in the pipeline in 2015. The projects had a combined capacity of 300 MW, with the majority of the projected output coming from PV (47%), followed by biomass (37%), and then tidal (7%).

Renewable	Capacity (MW)	MWh
PV	50.65	44,369
Landfill gas	8.47	41,699
Wind	0.08	184
Geothermal	3.35	26,411
Total	62.55	112,663

Table 1 - Existing renewable energy in the Solent

3.32 Table 2 shows an estimate for additional renewable capacity in the Solent, along with their potential carbon savings. For the majority of the sources a range is provided indicating the lower and higher ends of the estimates. Carbon savings for tidal energy are not shown as at the time of the report's preparation the relevant research was still being conducted.

Renewable	Capacity (MW)	CO2 saved (Kt)
Onshore wind	2554	1000 - 1608
Biomass	1008 - 1094	1095 – 1615
Energy from waste	1013 - 2087	1537 - 2017
Biogas	13 - 85	10 - 22
Hydro	2	2 – 4
Micro-generation	2535 - 2757	659 – 868
Tidal	25 - 249	Unknown
Total	7150 - 8828	4303 – 6134

Table 2 - Capacity for additional renewables in the Solent

3.33 The study provides figures for the Gross Value Added for renewable energy production in the Solent, taking into account efficiency savings, money retained within the area and job creation. The figures are listed below in Table 3, and while all forms of renewables show economic value, hydro power, biomass and photovoltaics stand out as being particularly beneficial.

Renewable	GVA per MW in 2020 (£)
Onshore wind	18,000
Biomass (waste)	844,000
Biomass (energy crops)	969,000
Energy from waste	815,000
Landfill gas	173,000
PV	911,000
Tidal	307,000
Hydro	1,055,000

Table 3 - GVA per MW

3.34 Table 4 shows the economic potential for various types of renewable energy in the Solent, with biomass, photovoltaics and energy from waste / landfill having the greatest potential. The table separates the economic value of renewables

into categories of energy security, economic development value, and carbon savings (based on not consuming fossil fuels). All forms of renewables show multi-millions pound economic value, with biomass, photovoltaics, energy from waste / landfill and onshore wind offering value in excess of several billion pounds.

Renewable	Energy Security (£)	Economic Development (£)	Carbon Savings (£)	Total Economic Value (£)
Biomass	508,041,000	612,499,000	10,971,000	1,131,511,000
EFW / Landfill	503,231,000	108,238,000	11,940,000	623,407,000
Onshore wind	447,056,000	45,068,000	10,727,000	502,851,000
Tidal	17,585,000	7,709,000	114,000	25,409,000
PV	131,848,000	686,320,000	1,139,000	819,307,000
Hydro	301,000	1,815,000	13,000	2,129,000
Total	1,608,062,000	1,461,647,000	34,905,000	3,104,614,000

Table 4 - Total economic potential of renewables in the Solent

- 3.35 With the exception of tidal power, as shown in Table 5 all forms of renewables are largely unexploited in the Solent. In particular, energy from waste and landfill gas, onshore wind and hydro are unexploited to a degree of 98% or greater. It should be noted however that it may not be technically, financially or environmentally feasible to ever exploit 100% of a renewable resource. The report does highlight that the Solent has the added advantage of its maritime location to exploit offshore wind and tidal opportunities.

Renewable	Total Economic Value (£)	Uncommitted Value	Uncommitted Percentage
Biomass	1,131,511,000	1,027,583,000	91%
EFW / Landfill	623,407,000	619,384,000	99%
Onshore wind	502,851,000	493,516,000	98%
Tidal	25,409,000	11,289,000	44%
PV	819,307,000	743,690,000	91%
Hydro	2,129,000	2,129,000	100%
Total	3,104,614,000	2,897,591,000	93%

Table 5 - Total economic potential of renewables in the Solent

- 3.36 The value of energy efficiency projects in reducing waste and bills, creating local jobs, and reducing the level of investment needed in energy production and supply infrastructure is discussed within the report. Of the 34,491 households in Gosport, 20% of them (6,863) are estimated to have solid walls. These properties would benefit from solid wall insulation, which would save the average property 2,400 kWhs per year. For the other properties, cavity wall insulation would save the average dwelling 1,600 kWhs per year, while a modern replacement boiler and loft insulation would save 1,800 kWhs and 400 kWhs respectively.

- 3.37 A particular issue is raised with energy efficiency in non-domestic buildings which tend to be slow to implement due to a disincentive for tenants to invest in the property, while landlords prefer to wait until a building is unoccupied before they carry out any upgrades.
- 3.38 Grid resilience is a major energy concern going forward, with particular threats from ageing infrastructure, climate change (more extreme weather), failure of generation (including from intermittent renewables) and an economic upswing (and/or population growth) leading to increased demand. Particular threats to Gosport's energy supply come from coastal flooding, prolonged hot and dry periods, and severe 'space weather', which has the potential to significant damage the grid. A national target of storing 3% of electricity needs in each locality, in order to increase network resilience and support renewables, is mentioned however it is acknowledged that this is currently a high-cost option.
- 3.39 Smart energy management technologies are also highlighted as potential options to help manage energy loads, reduce the need for costly infrastructure, and support the deployment of renewables. Smart technologies could also help integrate transport and communication services, to improve travel outcomes.
- 3.40 Amongst other actions the report recommends raising upfront investment to improve domestic energy efficiency. Improvements in port infrastructure, such as more charging cables, would help support the transition to electric boats and ships, while some ports could have upgrades to help support offshore renewables' industries. Overall the conclusion of the report is that the Solent is an area with enormous potential for renewables and improved energy efficiency, which would enhance environmental, social and economic outcomes.

Appendix 1: Evidence studies and other references

National Policy

National Planning Policy Framework (Ministry for Housing, Communities and Local Government (MHCLG), 2021)

www.gov.uk/government/publications/national-planning-policy-framework--2

National Planning Practice Guidance (MHCLG, 2021)

www.gov.uk/government/collections/planning-practice-guidance

Environment Bill 2020 (UK Parliament, 2020)

www.gov.uk/government/publications/environment-bill-2020

BREEAM Communities International (BRE, 2012)

<https://www.breeam.com/discover/technical-standards/communities/>

Home Quality Mark ONE (BRE, 2015)

<https://www.homequalitymark.com/>

Passivhaus Standard (Passivhaus Trust 2020)

<https://www.passivhaustrust.org.uk/>

The Stern Review (HM Treasury, 2006)

<https://onlinelibrary.wiley.com/doi/abs/10.1111/j.1728-4457.2006.00153.x>

The Fifth Assessment Report of the IPCC (IPCC 2014)

<https://unfccc.int/topics/science/workstreams/cooperation-with-the-ipcc/the-fifth-assessment-report-of-the-ipcc>

A Green Future: Our 25 Year Plan (DEFRA, 2018)

www.gov.uk/government/publications/25-year-environment-plan

Sub-Regional Policy

PUSH Spatial Position Statement (PFSH, 2016)

<https://www.push.gov.uk/work/planning-and-infrastructure/push-position-statement/>

South Hampshire Green Infrastructure Strategy 2017-2034 (PFSH 2017)

<https://www.push.gov.uk/wp-content/uploads/2018/08/South-Hampshire-GI-Strategy-2017-2034-FINAL.pdf>

Strategic Flood Risk Assessment (PFSH 2016 Update)

<https://www.push.gov.uk/wp-content/uploads/2018/05/Flood-Risk-Assessment-Update-2016-1.pdf>

Hampshire County Council Climate Change Strategy (HCC 2020)

<https://documents.hants.gov.uk/environment/Hampshire-Climate-Change-strategy-2020-2025.pdf>

Solent Energy Strategy (PUSH/Future Solent 2015)

<https://www.push.gov.uk/wp-content/uploads/2018/05/Solent-Energy-Strategy-2015.pdf>

Local Policy

Gosport Profile – Climate Change (GBC 2021)

www.gosport.gov.uk/gosportprofile

Sustainable Development and Climate Change Background Paper

Interim Strategic Flood Risk Assessment (iSFRA) of the Gosport Borough Local Plan 2038 (GBC, 2021)

www.gosport.gov.uk/gblp2038evidence

Council 'plan on a page' (GBC)

https://www.gosport.gov.uk/media/2221/Council-Plan/pdf/GBC_Plan_On_A_Page_summary.pdf?m=637000090856130000