



# Draft Climate Change Supplementary Planning Document (SPD) 2023

Hammersmith and Fulham Council



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# Introduction

## Introduction

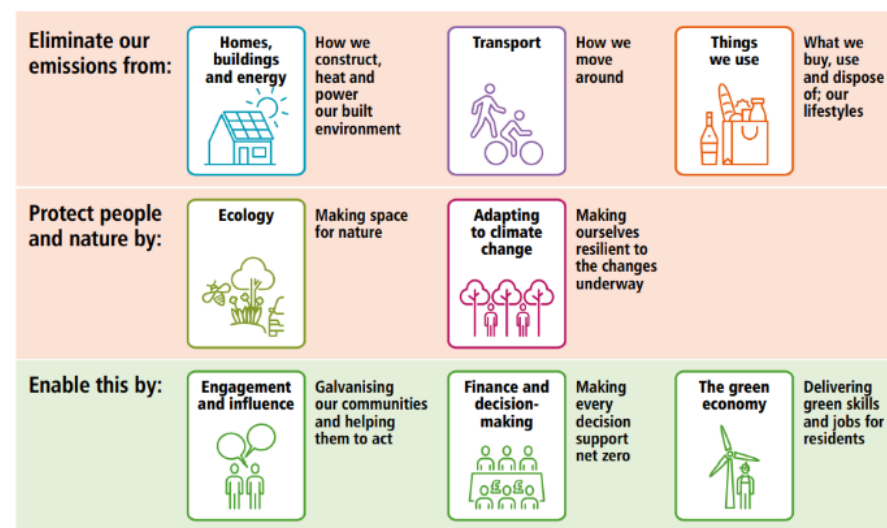
1.0 Hammersmith & Fulham (H&F) is heavily invested in halting the climate emergency. The Council declared a climate and ecological emergency in July 2019, with an ambition to meet net zero carbon emissions for the borough by 2030. As part of the findings of the H&F Climate and Ecological Emergency Commission, it was established that:

*“The council needs to define a positive vision and embed a culture of change to help us reach net zero by 2030, through strong and persistent leadership on Climate and Nature”.*

1.1 A large portion of Hammersmith and Fulham lies within flood risk zones at risk from rising sea levels, and periods of both extreme rainfall and drought made more likely by rising temperatures meaning that the lives and livelihoods of the borough’s most vulnerable residents will be at risk. The borough is particularly vulnerable to high heat due to its density of buildings, and the resulting heat island effect. Additionally, the climate emergency is closely linked with long-term ecological decline as a result of habitat loss. Even with extensive action now, it is recognised that current levels of greenhouse gases in the atmosphere will lead to permanent changes in the climate resulting more extreme weather events, heightened flood risk, and further challenges for the natural environment, people, and cultural heritage. The widespread and potentially devastating impacts of climate change place a responsibility on us all to minimise our carbon emissions, and this must be seen as an essential component of all development.

1.2 As Hammersmith and Fulham continues to grow, there is an increasing need for businesses, homes, health facilities, retail and leisure outlets, transport, and other supporting infrastructure, all of which can result in an adverse impact on the climate. It will be vital to the long-term sustainability of the borough, and the health, safety, and quality of life of residents, that adaptations are made to this new reality and new development is designed to deal with changes in the climate and reduce greenhouse gas emissions. Green infrastructure and nature recovery will have a role to play in this, helping to mitigate the impacts of high temperatures, reduce flood risk, and maintain biodiversity. Hammersmith and Fulham Council, residents, and businesses all have a part to play in realising these collective ambitions. The Council is committed to working with and supporting others to achieve these aims.

## What do we need to do?



1.3 It is widely acknowledged that tackling the climate emergency will need changes not only in planning, but right across society and the economy.

1.4 Over the past hundred years, human activity - in particular, the burning of fossil fuels - has caused the concentration of greenhouse gases in the atmosphere to rise sharply. According to [NASA](#), if we continue to rely on fossil fuels as we do now, CO<sub>2</sub> levels will continue to rise to levels of 1500 parts per million (ppm). For context, the preindustrial level of CO<sub>2</sub> was about 280 ppm<sup>1</sup>. As a result, CO<sub>2</sub> in the atmosphere would not return to pre-industrial levels even tens of thousands of years into the future. This has already resulted in over a 1°C rise in global average temperatures, resulting in sea level rises that threaten low-lying areas, and increasingly frequent extreme weather events. According to the United Nations (UN) secretary-general's special representative on disaster risk reduction, Climate change is already causing one disaster around the globe per week<sup>2</sup>.

1.5 Successive governments have recognised climate change as a significant challenge. The Climate Change Act 2008 introduced a legally binding target for the UK to reduce its carbon emissions by at least 80% by 2050 compared to 1990 levels. Amended in June 2019, this legislation now requires a 100% reduction in greenhouse gas emissions by 2050 -

known as the net zero target. The Government have since made further statements regarding an earlier target for carbon neutrality by 2035, and the Government's sixth carbon budget sets out a more ambitious target of 68% reduction by 2030<sup>3</sup>. Despite this, the UK Climate Change Committee (CCC) 2022 Progress Report to Parliament has warned the Government that current policies will fail to deliver net zero by the legally binding target<sup>4</sup>. Analysis contained within the report shows that carbon emissions rose 4% across the UK in 2021 compared with 2020 as the economy began to recover from the COVID-19 pandemic. The report recognises the role of Planning Policy in preventing and mitigating climate change through place-shaping, active travel, public transport, shared mobility, and efficient and sustainable building practices.

1.6 Local planning authorities have a statutory duty to take action on climate change and to reduce emissions (as per Section 19 of the Planning and Compulsory Purchase Act 2004, and the National Planning Policy Framework), and the Council will seek to balance the competing demands of growth and mitigate any negative impacts as far as is reasonably possible. Achieving the net zero target will require coordinated effort, and it is important that, where possible, planning policy matches ambitions and goals of other departments in the Council.

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<sup>1</sup> Massachusetts Institute of Technology (MIT), '[What is the ideal level of carbon dioxide in the atmosphere for human life?](#)'

<sup>2</sup> United Nations, '[Staggering' rise in climate emergencies in last 20 years, new disaster research shows](#) || UN News

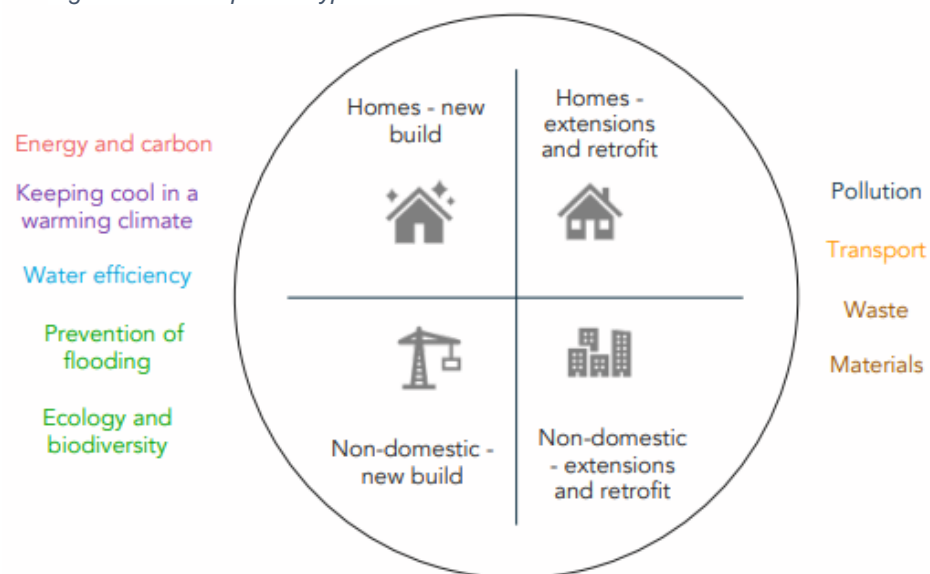
<sup>3</sup> [The Carbon Budget Order 2021 \(legislation.gov.uk\)](#)

<sup>4</sup> Climate Change Committee, [2022 Progress Report to Parliament - Climate Change Committee \(theccc.org.uk\)](#)

## Purpose of the Climate Change SPD

1.7 The purpose of this SPD is to provide supplementary guidance for the planning policies contained in the council's Local Plan that relate to climate change and to help implement the actions contained in the council's climate change strategy. This includes topics encompassing (but not limited to) sustainable design and construction, flooding, energy, ecology, waste, and transport and travel.

Figure 1: Development Types



*This SPD covers all development types: new-built and retrofit, homes and non-domestic buildings. A broad range of climate change and sustainability issues are addressed.*

### Key aims of this SPD and the Climate Change Strategy

- Implement the **Council's Vision for 2030**.
- Promote reduction and re-use as well as recycling to achieve Borough's targets on **household waste and recycling**.
- Promote pedestrian-friendly and **cycle-friendly transport** network.
- Take action on **air quality issues**, especially those caused by vehicle emissions, and encourage sustainable travel throughout the borough and beyond.
- Work with partners to ensure the environmental quality of open spaces is of the highest quality including the **promotion of biodiversity**, rewilding, and the phasing out of pesticide use other than in exceptional and defined circumstances; and
- Making **H&F a net zero-carbon organisation**, including the offices and other assets, by working with staff and partners to implement the Council's Climate and Ecology Strategy.

## How to use this SPD

1.8 This SPD is intended for use by developers, landowners, homeowners, planning officers, and other interested parties when preparing and assessing planning applications.

### Do I need planning permission?

1.9 Some of the climate change adaptations and measures discussed within this document do not require planning permission. Please visit [Climate change and planning | LBHF](#) and the Heritage chapter of this SPD to check if your proposal is permitted development or whether it needs planning permission.

### Building Regulations

1.10 Building Regulation requirements apply on a number of the issues covered by this document, and guidance on these is provided online here: [Building Regulations and Approved Documents index - GOV.UK \(www.gov.uk\)](#) In many cases, planning policy requires better levels of performance than the minimum standards set in these Regulations.

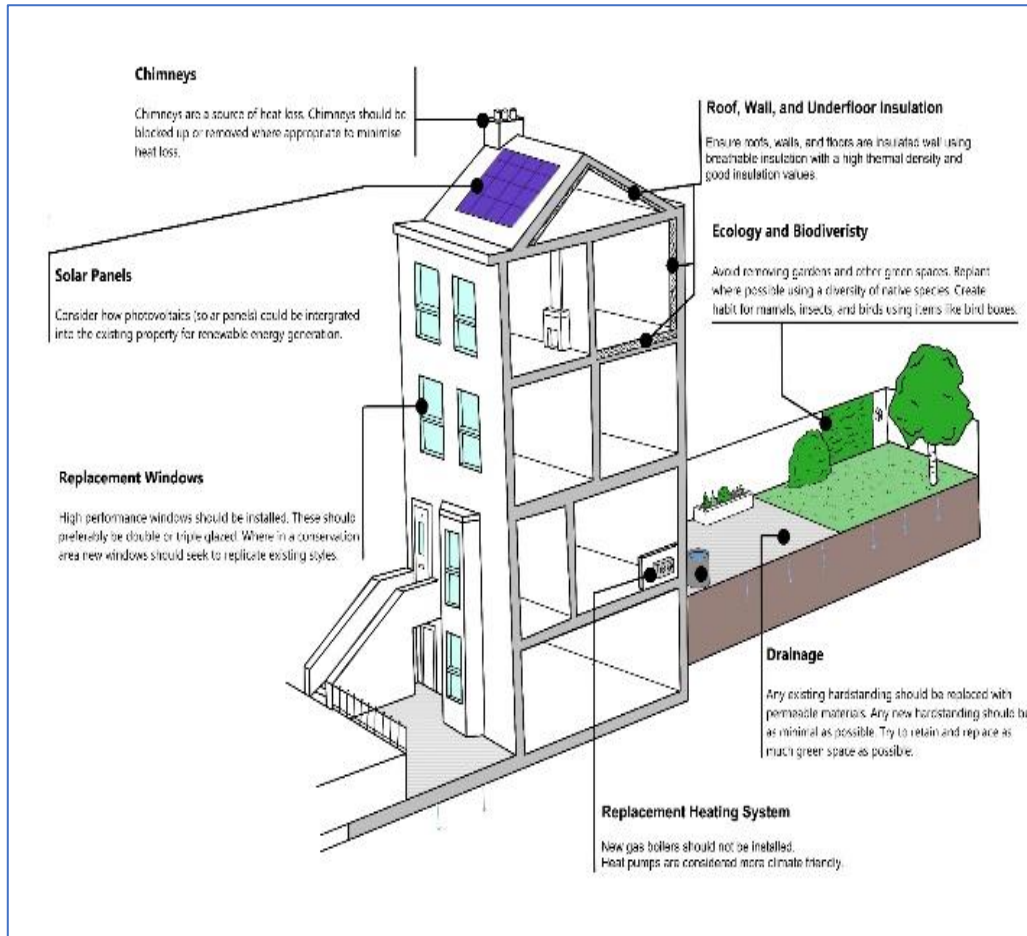
### Planning applications

1.11 The guidance in this SPD applies to new build homes, extensions and retrofitting of homes, non-domestic and mixed-use developments. Applicants will be expected to demonstrate, within their development proposals, how they have integrated in the early stages of design, an acceptable and proportionate response that aligns with the SPD. The Council advise that applicants should also read other best practice guidance and evidence documents where referenced in this document. A checklist at the end of this SPD provides the applicant an easy-to-digest summary of what to include in your application.

1.12 **Interactive summaries** are provided for each of the four building categories illustrating key measures for addressing climate change. Associated key principles can be found in the **guidance chapter** of this SPD.



## Interactive summary example



## Guidance chapter example

### Building form

All developments should seek to achieve a net zero energy balance on-site. Optimising building form can make it easier and cheaper to achieve these targets.

#### Simple forms are more energy efficient

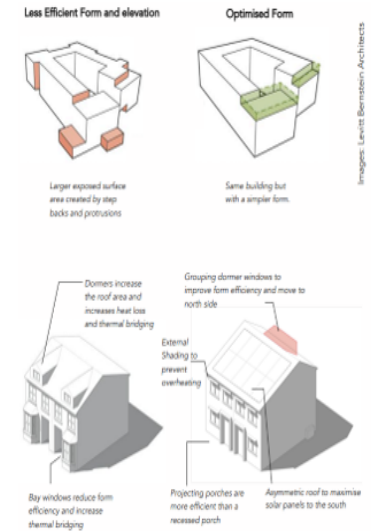
The building form should be simple and compact. Join homes into terraces and simplify the form of apartment buildings where possible. This will reduce the exposed surface area, reducing the amount of heat that is lost through the walls and roof. A simple shape also reduces the number of junctions and corners in the walls and roof, where it can be difficult to make sure that insulation is continuous, and where extra heat can be lost (thermal bridges).

#### Harnessing energy from the sun for heating

Utilise principles of passive solar design to reduce winter heating load, limit summertime overheating and aid natural ventilation.

#### Maximising renewable energy generation

Consider how the building form supports the capture of renewable energy, passive solar gains from the sun, and efficient natural ventilation where possible.



#### Key principles – What you CAN do

- Achieve a net zero energy balance on-site.
- Keep the building form simple and compact.
- Consider how the building form supports the capture of renewable energy



## How to interpret the Key principles

### What you MUST do

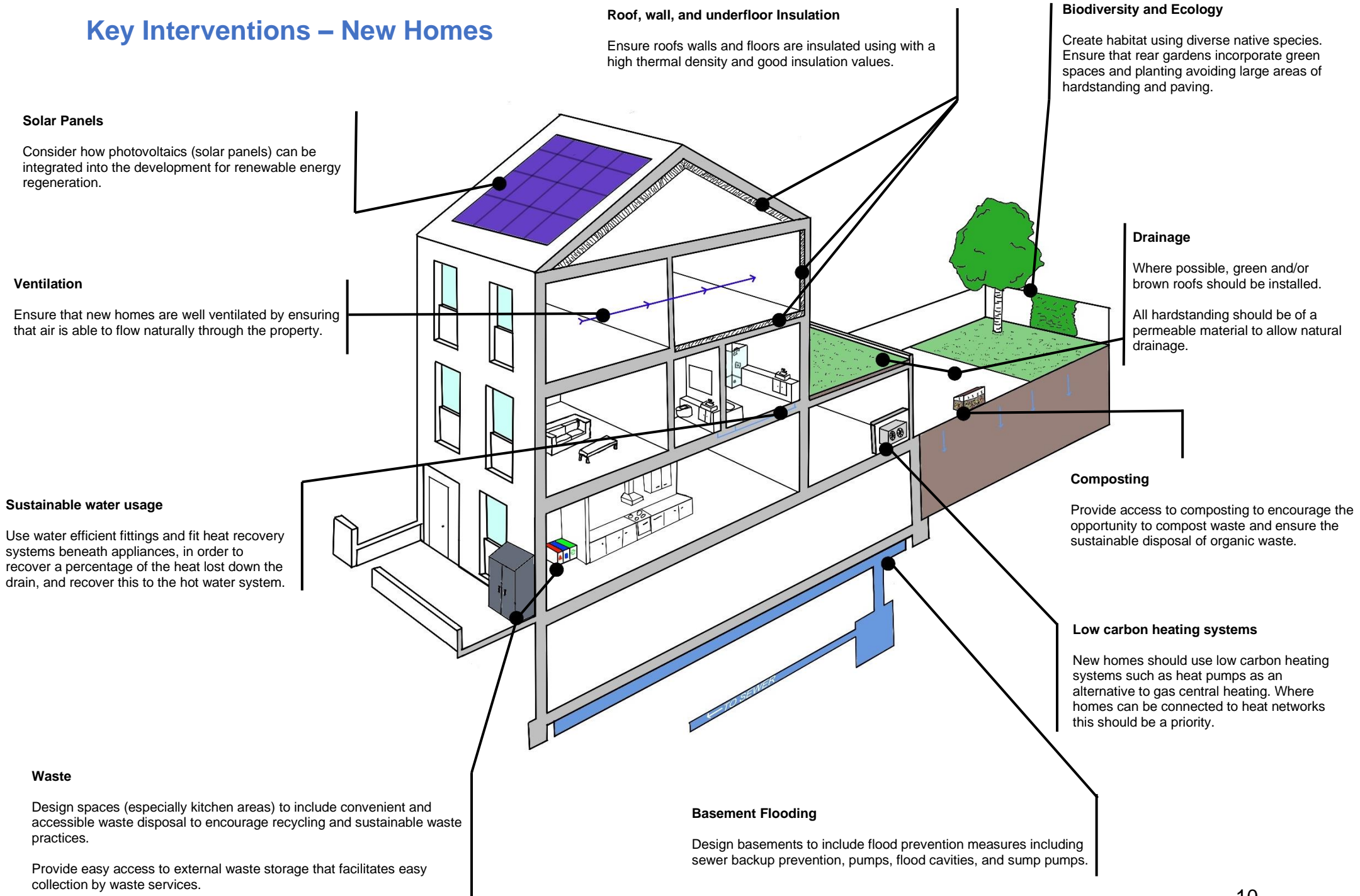
The SPD key principles are split into two parts. The first are “**What you must do – Key Principles**”. These are intended principally for applicants seeking planning permission, and for planning decision makers. These key principles have been produced to ensure that applicants provide the right information so that planning decision makers can assess whether development proposals comply with Local Plan policies. These key principles are a material consideration in the determination of planning permission. Any writing in red represents the key principles that must be considered as part of any development. These principles are considered the bare minimum requirements for a development to acquire the basic level of climate resilience and must be incorporated into development in order to obtain planning permission.

### What you CAN do

In addition to this, the Council has chosen to use this document to show what can be done outside of the requirements of the Local Plan. These are “**What you can do – key principles**” and are examples of good practice and steps that can be taken to minimise the impact of climate change on the built and natural environment. These are intended for residents who would like to make their properties more climate friendly, and for developers who are looking to go above and beyond the requirements of the current Local Plan in ensuring that their developments are as environmentally friendly as possible.

# Interactive Summaries

# Key Interventions – New Homes



# Key Interventions - Retrofitting Homes

## Chimneys

Chimneys are a source of heat loss. Chimneys should be blocked or removed where appropriate to minimise heat loss.

## Solar Panels

Consider how photovoltaics (solar panels) could be integrated into the existing property for renewable energy generation.

## Replacement Windows

High performance windows should be installed. These should be either double or triple glazed. In conservation areas these new windows should seek to replicate existing styles.

## Conservation and Listed Buildings

It is possible to undertake climate friendly retrofit with heritage buildings. Early conversations with Conservation Officers and use of the Council's pre-application service is recommended to ensure that the most climate friendly retrofit can be achieved whilst also ensuring the proposals meet conservation and design policies.

## Roof, Wall, and Underfloor Insulation

Ensure roofs, walls and floors are insulated well using breathable insulation with a high thermal density and good insulation values. Insulation should be selected based on the original building construction and materials.

## Ecology and Biodiversity

Avoid removing gardens and other green spaces. Replant where possible using a diverse range of native species. Create habitat for mammals, insects and birds using items such as bird boxes.

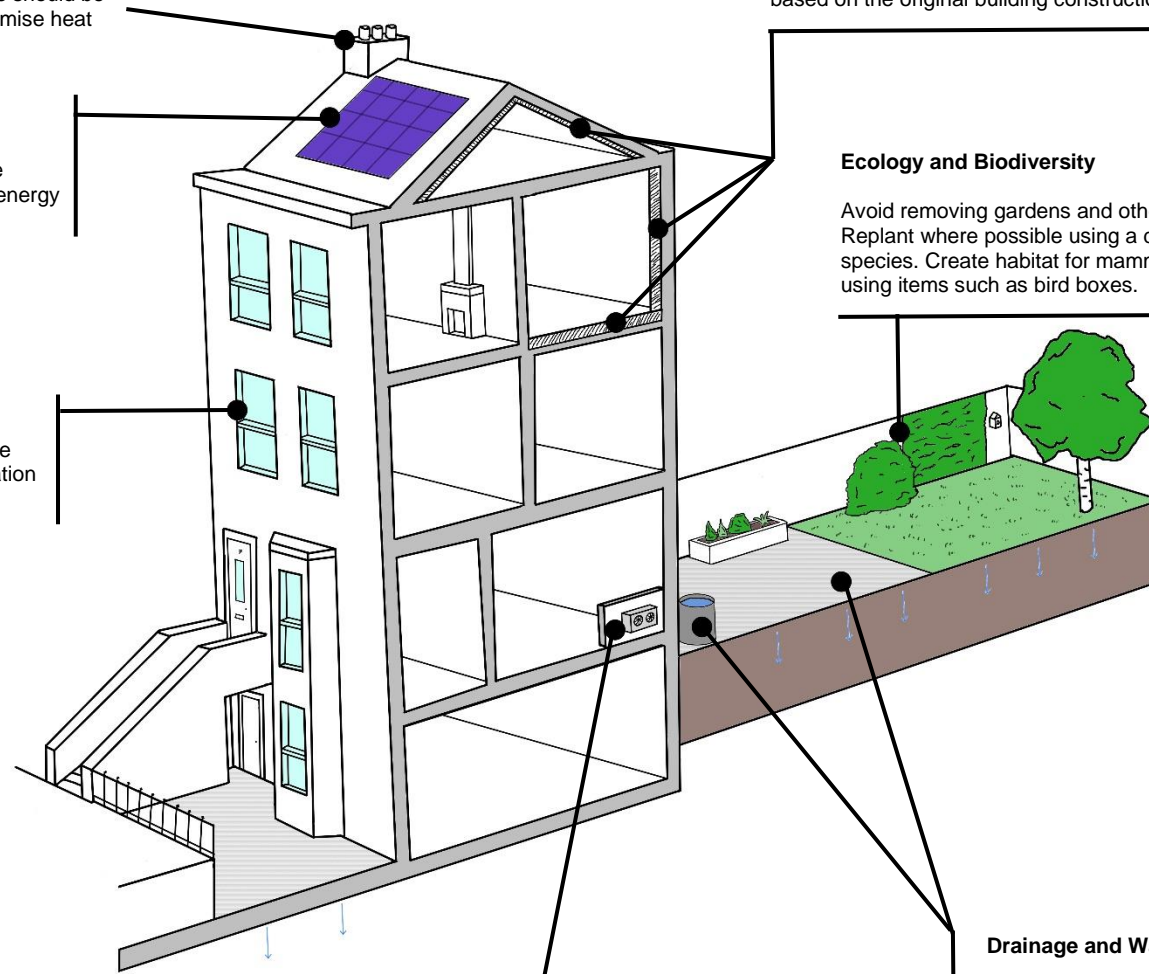
## Replacement Heating System

New gas boilers should not be installed. Heat pumps are considered a climate friendly alternative.

## Drainage and Water Efficiency

Any existing hardstanding should be replaced with permeable materials. Any new hardstanding should be avoided. Try to retain and replace any green space as far as possible.

Water Butts can be a great way to ensure efficient and sustainable water usage.



# Key Interventions – New Non-Domestic Buildings

## Drainage

Urban greening contributes to the removal of surface water and removes the risk of flooding.

All hardstanding should be of a permeable material to allow natural drainage.

Soft landscaping provides benefits for local ecology.

## Avoid Overheating

Consider a Brise Soleil to provide shading and limit summertime solar gain – especially where large expanses of glazing is included as part of the design.

## Renewable Energy

Consider how renewable energy sources can be incorporated into the development to match annual energy use of the building.

When incorporating renewable energy, roof design should be optimised for energy generation.

## Ventilation

Ensure that spaces are well ventilated by ensuring that air is able to flow naturally through workspaces using secure cross ventilation.

## Waste Management

Design spaces (especially kitchen areas) to include convenient and accessible waste disposal to encourage recycling and sustainable waste practices.

Provide easy access to external waste storage that facilitates easy collection by waste services.

## Sustainable water usage

Use water efficient fittings and fit heat recovery systems beneath appliances, in order to recover a percentage of the heat lost down the drain, and recover this to the hot water system.

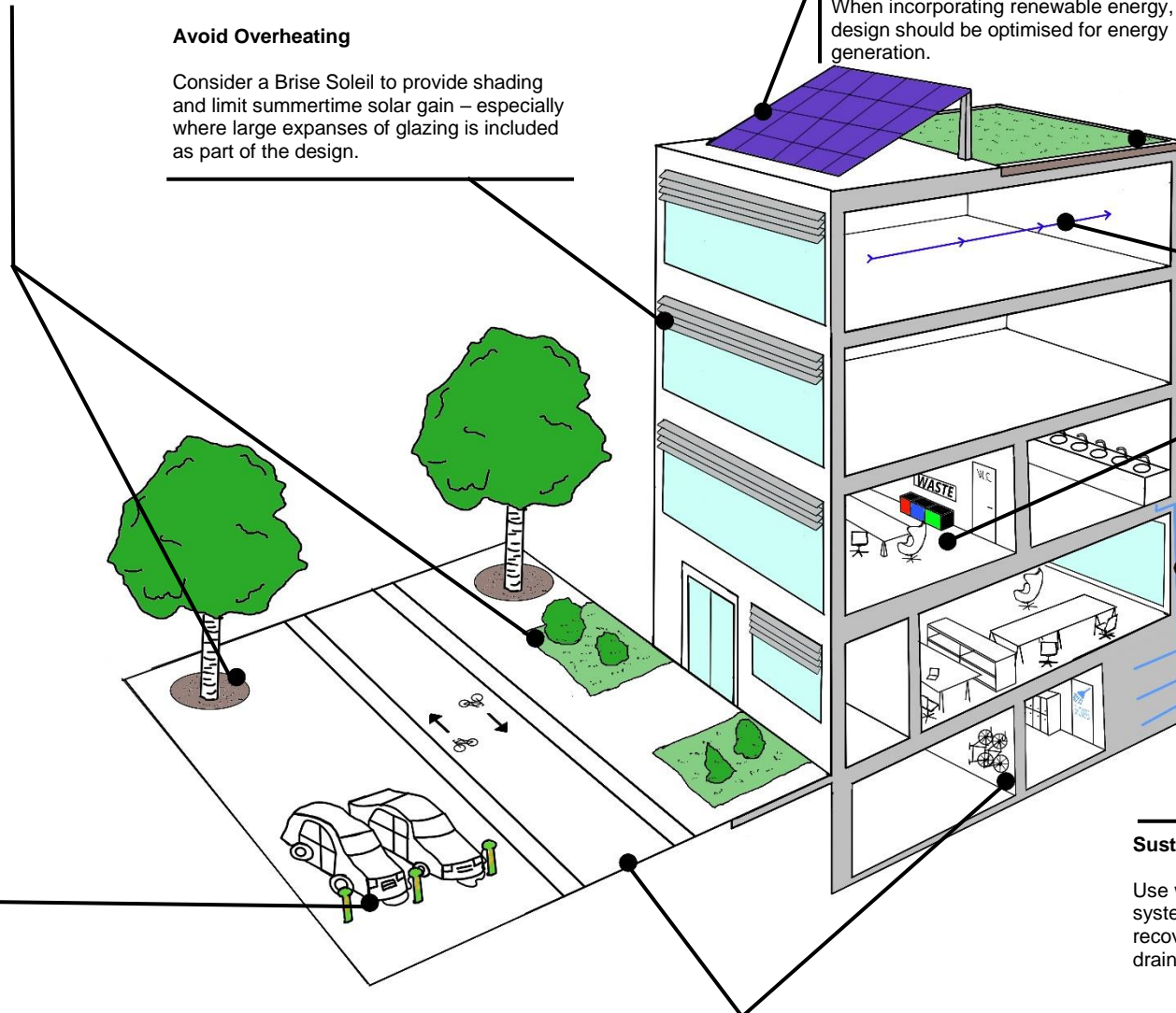
## Active Transport

Active travel should be encouraged by connecting developments to local cycling and walking routes.

Provide secure cycle parking and other associated facilities for workers and visitors to encourage cycling and other forms of active travel.

## Transport

Electric charge points should be provided where car parking is included as part of the development.





## Key Interventions - Mixed use buildings and high-rise buildings

### Avoid Overheating

Consider a Brise Soleil to provide shading and limit summertime solar gain – especially where large expanses of glazing is included as part of the design.

Avoid large expanses of east/west facing glazing.

### Drainage

Urban greening contributes to the removal of surface water and removes the risk of flooding.

All hardstanding should be of a permeable material to allow natural drainage.

Soft landscaping provides benefits for local ecology.

### Biodiversity and Ecology

Create habitat using diverse native species. Ensure that rear gardens incorporate green spaces and planting avoiding large areas of hardstanding and paving.

Consider providing small planting spaces on balconies and other exposed spaces to encourage planting for biodiversity.

### Active Transport

Active travel should be encouraged by connecting developments to local cycling and walking routes.

Provide secure cycle parking and other associated facilities for both residents and visitors to encourage cycling and other forms of active travel.

### Waste Management

Design to include convenient and accessible waste disposal to encourage recycling and sustainable waste practices.

Ensure that separate waste disposal and storage facilities are provided for residential and commercial uses.

Provide easy access to external waste storage that facilitates easy collection by waste services.

### Renewable Energy

Consider how renewable energy sources can be incorporated into the development to match annual energy use of the building.

When incorporating renewable energy, roof design should be optimised for energy generation

### Ventilation

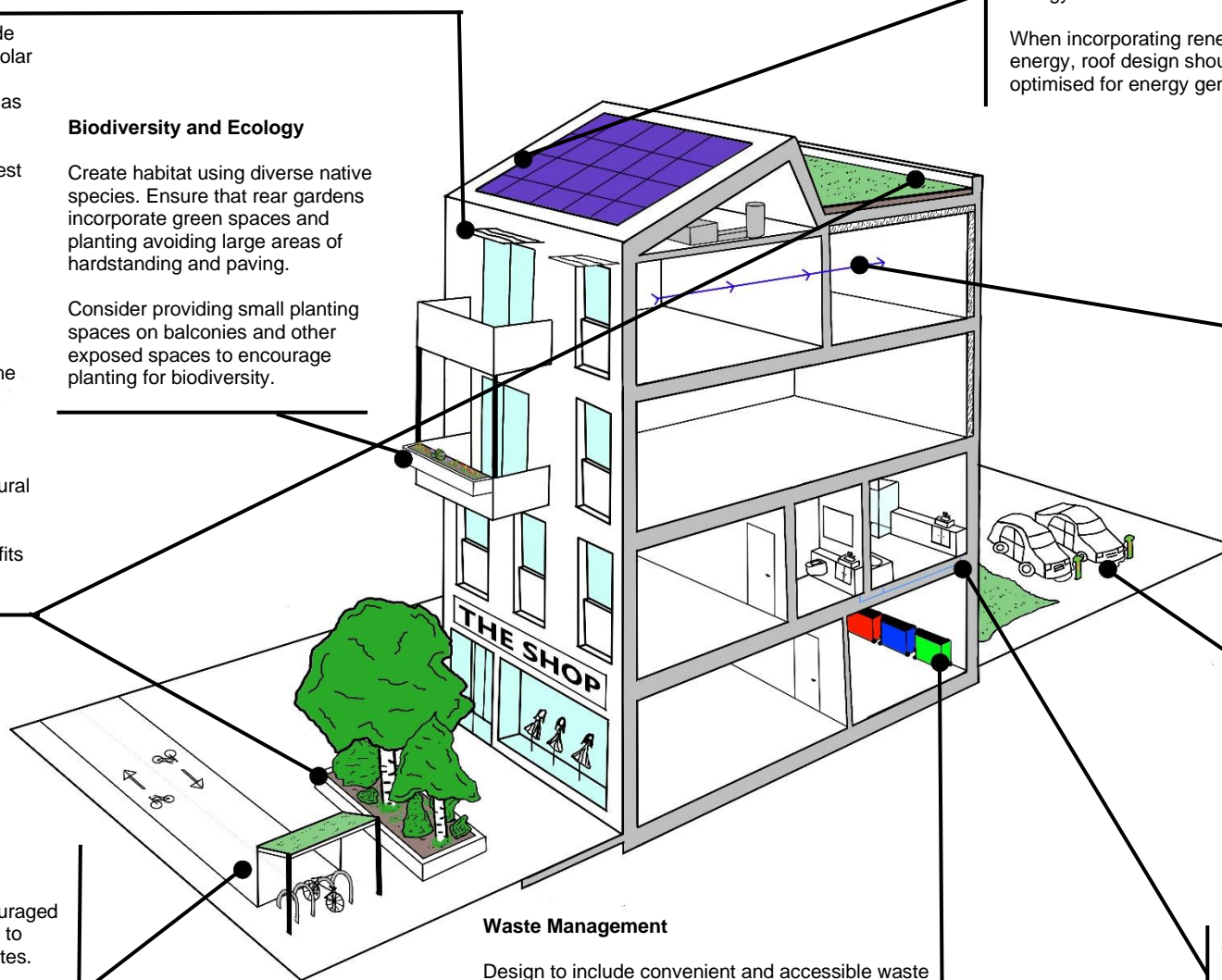
Ensure that spaces are well ventilated by ensuring that air is able to flow naturally through workspaces using secure cross ventilation.

### Transport

Electric charge points should be provided where car parking is included as part of the development.

### Sustainable water usage

Use water efficient fittings and fit heat recovery systems beneath appliances, in order to recover a percentage of the heat lost down the drain, and recover this to the hot water system.



# Guidance



## Retrofitting your property

2.0 Retrofitting your property will be supported in Hammersmith and Fulham, where proportionate measures are taken to improve the energy efficiency of existing buildings as well as providing comfortable and healthy internal environments, adapting the building to cope with impacts of climate change.

2.1 A whole building approach, which looks at all parts of the building and all potential opportunities to tackle climate change, should be taken into consideration to ensure a holistic and balanced strategy is developed in each case.

2.2 Clean energy sources which rely on external systems/infrastructure/units should also be considered sensitively, and in conjunction with mitigation measures such as urban greening.

2.3 To see if you need planning permission for your retrofit scheme, please visit [Climate change and planning | LBHF](#)

2.4 If your property is in a conservation area, is a building of merit or a listed building please see the heritage and conservation chapter (page 42) for further advice.

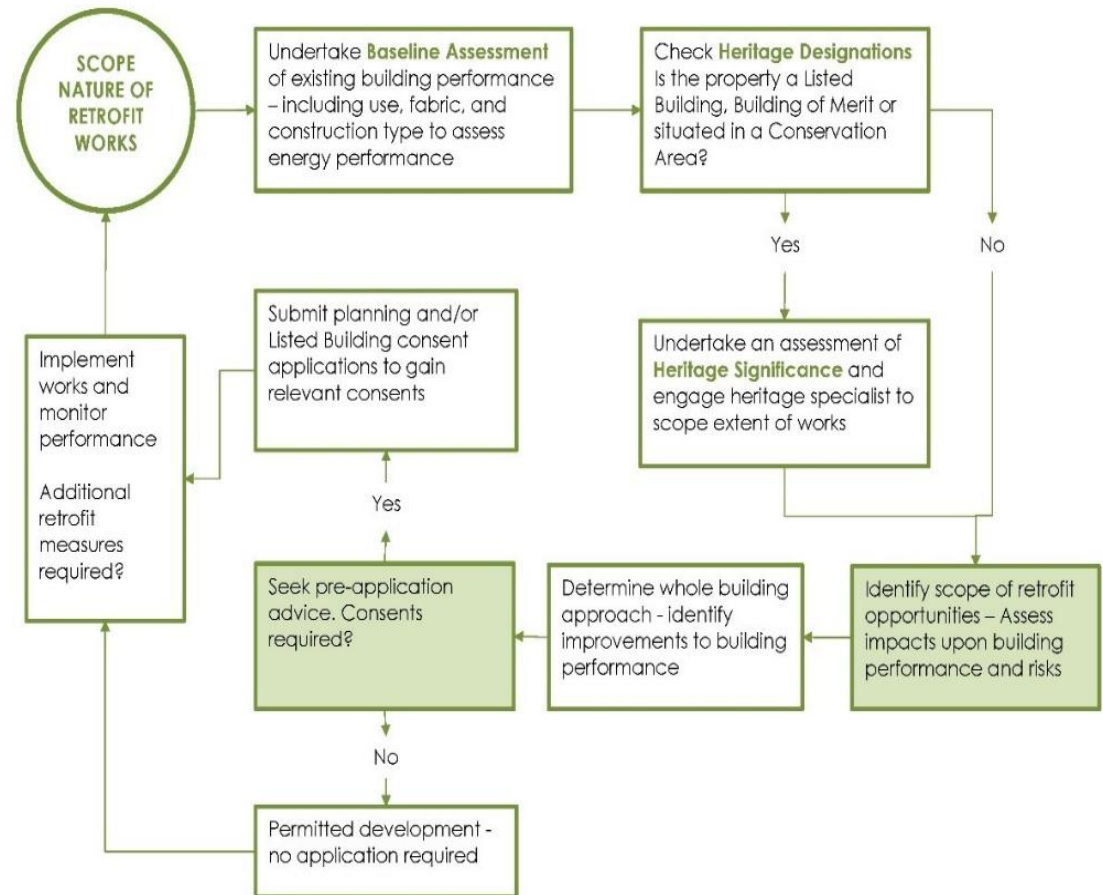


Figure 2: Process for undertaking a retrofit project.

## Net zero carbon buildings

2.5 New major developments in the borough must achieve Net Zero carbon in operation through applying the three core principles outlined below, and by demonstrating the Key Performance Indicators (KPIs) defined by LETI and reproduced on the right. Similarly high levels of performance are also encouraged for smaller developments.

### Energy efficiency

- Buildings should use energy efficiently. Space heating demand expresses the amount of energy a building needs for heating and is impacted by site and orientation, window design, form, building fabric, materials and detailing, and ventilation (see relevant chapters below).
- Energy Use Intensity (EUI) expresses the total amount of energy a building uses and can be measured in-use through energy meters. It is impacted by the space heating demand, the choice of heating system, ventilation system, lighting, cooking, appliances, and other equipment (see relevant chapters below).

### Low carbon heating

- All new buildings should be built with a low carbon heating systems and where possible should avoid connecting to the gas network.

### Renewable energy generation

- In new buildings, it is recommended that annual renewable energy generation should be at least equal to the energy use of the building (the EUI). If this is not possible on- site, it should be demonstrated that the equivalent of 120 kWh/m<sup>2</sup>/yr footprint/yr of renewable energy is generated across the development.





	Housing	Offices	Schools
Space heating demand, kWh/m <sup>2</sup> /yr 	15-20	15-20	15-20
Energy use intensity (EUI), kWh/m <sup>2</sup> /yr 	35	55	65
Renewable energy 	Balance EUI OR 120 kWh/m <sup>2</sup> /yr footprint	Balance EUI OR 120 kWh/m <sup>2</sup> /yr footprint	Balance EUI OR 120 kWh/m <sup>2</sup> /yr footprint
Embodied carbon 	350 kgCO <sub>2</sub> e/m <sup>2</sup> /yr	300 kgCO <sub>2</sub> e/m <sup>2</sup> /yr	300 kgCO <sub>2</sub> e/m <sup>2</sup> /yr

Figure 3 above: new developments should seek to achieve the KPIs recommended by LETI: [www.leti.london/cedg](http://www.leti.london/cedg)

LETI also has a Climate Emergency Retrofit Guide:  
[www.leti.london/retrofit](http://www.leti.london/retrofit)

## Building Form and Fabric

2.6 All developments should seek to achieve a net zero energy balance on-site. Optimising building form can make it easier and cheaper to achieve this target.

### Simple forms are more energy efficient

2.7 The building form should be simple and compact. Join homes into terraces and simplify the form of apartment buildings where possible. This will reduce the exposed surface area, reducing the amount of heat that is lost through the walls and roof. A simple shape also reduces the number of junctions and corners in the walls and roof, where it can be difficult to make sure that insulation is continuous, and where extra heat can be lost (through thermal bridges).

### Harnessing benefits of natural sunlight

2.8 Utilise principles of passive solar design to reduce winter heating load, limit summertime overheating and aid provision of natural light and ventilation.

### Maximising renewable energy generation

2.9 Consider how the building form supports the capture of renewable energy, particularly by providing space for installations such as solar PV panels, solar water heating systems and/or heat pumps to generate electricity and heat.

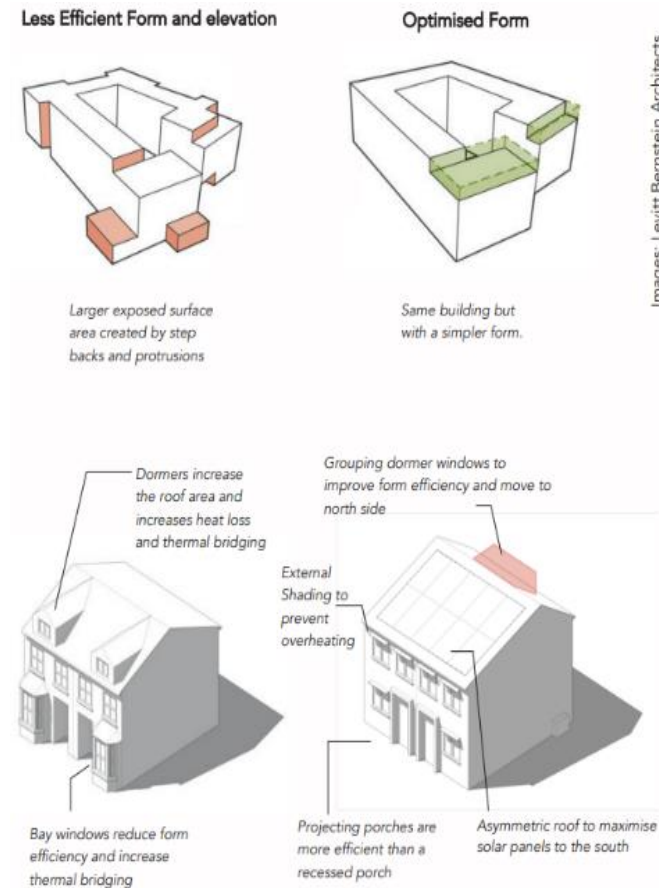


Figure 4: Building Form (Levitt Bernstein Architects)

## Reducing energy demand

2.10 Improving insulation levels of building fabric elements such as the walls, roof, floor etc beyond Building Regulation minimum requirements is technically feasible for most buildings, although it can be easier to do this in new developments.

2.11 Reducing energy demand by increasing insulation at the outset of the design of a building or extension should be prioritised over other measures such as installing renewable energy generation. This is in-line with the “Energy Hierarchy” approach (see below) and helps minimise carbon emissions and reduce energy costs.

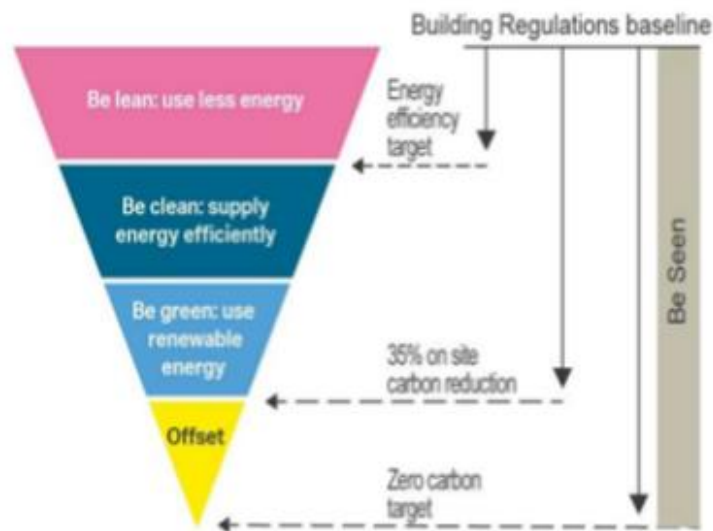


Figure 5: Energy Hierarchy

2.12 The LETI Climate Emergency Design Guide includes: [Climate Emergency Design Guide | LETI](#) includes recommended U-values (a measure of heat loss) for a range of building types such as small and medium scale housing projects, offices and schools, which are lower (and therefore better) than the Building Regulation requirements.

2.13 In many cases it is feasible to include building fabric elements which perform twice as well as the Regulations requirements.

### KP1 Key principles – What you CAN do

- Achieve a net zero energy balance on-site.
- Keep the building form simple and compact.
- Maximise inclusion of energy efficiency measures and go beyond the Building Regulation requirements on U-values
- Consider how the building form supports the capture of renewable energy
- Following Passivhaus principles can help achieve optimisation of passive design measures.

## Site and orientation

2.14 The orientation and massing of the building should be optimised, if possible, to allow useful solar gains and prevent significant overshadowing in winter. Encourage south facing buildings ( $\pm 30^\circ$ ) with solar shading and prioritise dual aspect. Overshadowing of buildings should be avoided as it reduces the heat gain from the sun in winter.

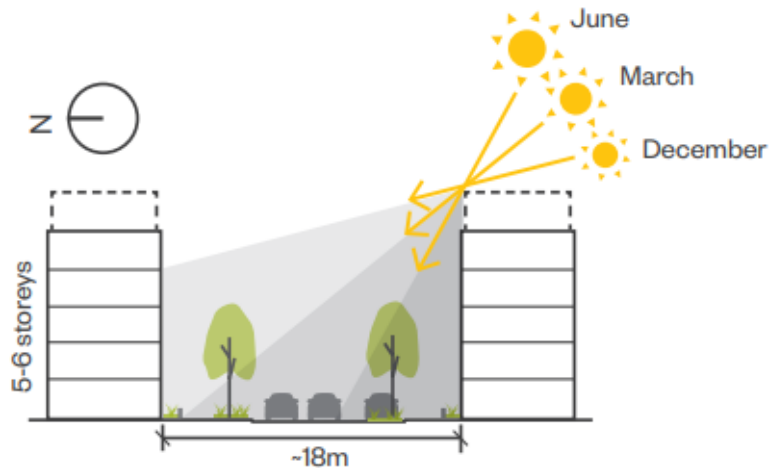


Figure 6: Overshadowing (Levitt Bernstein Architects)

### Overshadowing

2.15 Prioritise the south in orientating masterplans, angling the roofs to make the most of PV opportunities to the south. Allow a distance of 1 to 1.5 times the buildings height between buildings to avoid overshadowing and impacting internal solar gains.

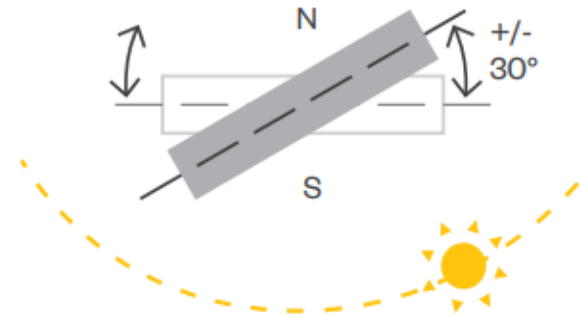


Figure 7: South Facing Buildings (Levitt Bernstein Architects)

### How big should the windows be?

2.16 Getting the right glazing-to-wall ratio on each façade is a key feature of energy efficient design. Minimise heat loss to the north (smaller windows) while providing sufficient solar heat gain from the south (larger windows).

#### KP2 Key principles – What you CAN do

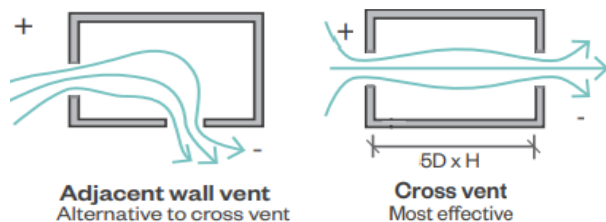
- Encourage south facing buildings ( $\pm 30^\circ$ ) with solar shading and prioritise dual aspect.
- Prioritise the south in orientating masterplans, angling the roofs to make the most of PV opportunities to the south.
- Allow a distance of 1 to 1.5 times the buildings height between buildings to avoid overshadowing and impacting the internal solar gains.

## Ventilation and Overheating

2.17 Overheating is one of the main impacts caused by climate change. The ten hottest years ever recorded have all occurred since 2002 and in July 2022 the highest UK temperature ever was recorded at 40.3°C. Extreme weather such as heatwaves are expected to increase in frequency and severity and could have serious impacts, including causing increases in death rates, other health and quality of life impacts and causing damage to and preventing efficient operation of vital infrastructure such as transport and energy networks. Heatwaves also create higher demand for drinking water supplies.

2.18 As a densely built inner London borough, H&F is particularly vulnerable to 'Urban Heat Island' (UHI) effects, in which urban areas can be up to 10°C warmer than surrounding areas. New developments need to be designed and built to provide adequate ventilation and avoid causing overheating in the summer. For existing buildings, there are retrofitting measures that should be considered to help improve air flow and keep over-heating to a minimum.

Figure 8: Ventilation (Levitt Bernstein Architects)



### KP3 Key principles – What you CAN do

- Follow the guidance laid out in the GLA's [Energy Assessment Guidance \(london.gov.uk\)](https://www.london.gov.uk/energy-assessment-guidance)
- For new developments, provide dual aspect dwellings where possible as this can help provide cross-ventilation via openable windows which can help control internal temperatures
- Avoid single aspect dwellings if possible as these are more difficult to ventilate and keep cool using natural, passive measures and therefore more likely to overheat.
- Consider minimising the glazing ratio to reduce the risk of overheating
- Design out the need to include active air conditioning systems and minimise their use
- Use Passivhaus standards to guide the design of developments in terms of ventilation
- If cooling is required, use an Air Source Heat Pump to do this



## KP4 Key principles – What you MUST do

### Householder and Minor Developments

- Assess ventilation provision and overheating risks and include mitigation measures where necessary
- Use site layout and building design to improve ventilation and reduce the risk of overheating.
- Include passive ventilation measures as the priority
- Use soft landscaping and green infrastructure to help provide shading and reduce surface temperatures. These features can also provide other benefits e.g. increase biodiversity levels and reduce flood risk
- Use other passive measures such as blinds and shades or painting surfaces white (e.g. flat roofs) where appropriate
- Manage overheating without having to rely on energy intensive mechanical air conditioning systems



Image1: Ventilation in the home

## KP5 Key principles – What you MUST do

### Major Developments

- Overheating modelling should be carried out and the results included in the scheme's Energy Assessment
- The London Plan "Cooling Hierarchy" should be followed to demonstrate that the design ensures that the potential for internal overheating is managed using passive design measures
- Where blocks of flats are being built, a minimum ceiling height of 2.5m for at least 75 per cent of the gross internal area is required so that the new units are adequate in terms of ventilation and cooling
- Reliance on air conditioning systems should be minimised but heat recovery used if they are installed
- Passive measures that should be maximised include:
  - Orientation
  - Shading
  - Prioritise passive ventilation where external factors such as noise levels and air quality allow
  - Use of high albedo materials
  - Inclusion of windows etc with low solar gains
  - Use of insulation which can prevent heat retention
  - Provide green infrastructure e.g. green roofs



## Low Carbon Heating and Renewable Energy

2.19 H&F, along with all other boroughs, needs to shift our current reliance on fossil fuels such as natural gas and move to a more diverse mix of energy sources which are low and zero-carbon, including renewable energy technologies.

2.20 Gas boilers are the single largest contributor to CO<sub>2</sub> emissions locally and the council's vision is that the borough's heat and power will be supplied by renewable energy and, where possible, by local sources that efficiently meet demand. Use of low-carbon heating will have a much greater benefit in terms of reducing CO<sub>2</sub> emissions than renewable electricity generation.

2.21 New developments have an important role in helping to increase the use of renewable energy, but many existing buildings are also capable of retrofitting energy generation technologies such as solar PV panels and Heat Pumps to provide low carbon heating and electricity. Solar thermal panels can also be considered as a way of generating hot water on-site, reducing energy demand. In summer months 100% of hot water demand can be met through one of these systems.

2.22 Buildings therefore have a vital role to play in helping to meet the council's commitment to be net zero carbon by 2030. On-site renewable energy generation will also help the borough become more self-sufficient and resilient in terms of its future energy use and can provide cheaper energy.

2.23 By adding energy efficiency and other energy reduction measures this can help improve the Energy Performance Certificate (EPC) rating of properties. Some of these measures could be done without the need for planning permission such as topping up loft insulation levels or upgrading the heating system. whereas others, like adding external insulation to a property may need further consideration in terms of planning implications and requirements.



### Use a heat pump

The preferred heating technology to meet zero carbon is a heat pump. There are lots of different types and arrangements to consider. To leave the most flexibility, a location for external fan units should be allowed.



### Design the roof for photovoltaic panels (PV)

Prioritise asymmetric south-facing or east/west roof pitches for maximum PV energy generation. Keep roof parapets as low as possible or keep PV away from parapets. Place roof plant to the north to avoid overshadowing.

Figure 9: Renewable Energy (Levitt Bernstein Architects)

## **KP6 Key principles – What you MUST do**

### **Major Developments**

- Provide an Energy Assessment with your application demonstrating how renewable energy generation will contribute to meeting the London Plan requirement to be net zero carbon
- Follow the London Plan “Energy Hierarchy” in designing an Energy Strategy for your building(s)
- Prioritise minimising energy demand first, then look at how energy will be supplied on-site by renewables
- Maximise available opportunities to integrate low/zero carbon heating renewable energy generation, such as solar PV panels and Ground or Air Source Heat Pumps, which are the most common renewable technologies being installed in the borough
- Include energy storage facilities where possible
- Use communal systems rather than individual installations for each dwelling and demonstrate how they can be integrated into wider local networks in the future
- Achieve a minimum 35% reduction in CO2 emissions through on-site measures compared to the Building Regulation baseline

2.24 Achieving good levels of airtightness beyond the minimum requirements of the Building Regulations can help to limit heat loss which in turn reduces energy use and associated CO2 emissions. One of the key principles of Passive House design is an extremely airtight building envelope. Mechanical ventilation with heat recovery helps control the internal environment, providing good indoor air quality and preventing issues such as damp and mould arising.

2.25 Smaller scale new developments are not currently required to submit supporting information on energy use or inclusion of low carbon heating and renewable energy to reduce CO2 emissions. However, these types of developments are encouraged to include low carbon heating and renewables where possible and in line with any other planning policy requirements.

## KP7 Key principles – What you CAN do

### All developments

- Consider working towards achieving an “energy balance” for your site i.e use on-site low carbon heating and renewable energy generation in conjunction with energy efficiency measures to provide all of your energy consumption, including heating, hot water and electricity
- If this is not possible, renewable energy generation should target at least 120 kWh/m<sup>2</sup> footprint/yr – see key performance indicators (page 16).
- Generate surplus energy and store this on-site for later use or sell into the national grid
- Use Heat Pumps with the best Coefficient of Performance ratings and PV panels with the highest efficiency - i.e. state of the art technology – in the interests of maximising on-site CO<sub>2</sub> reductions. Heat Pumps with lower Global Warming Potential refrigerants are also preferred
- PV panels are suitable for both new and existing buildings. Heat pumps are also suitable for both, but achieve better performance in more energy efficient buildings, so insulation and energy efficient glazing should be optimised.
- Listed buildings and conservation areas should seek the advice of the Conservation team (see chapter on Heritage and Conservation)
- Achieve a minimum 50% reduction in CO<sub>2</sub> emissions through on-site measures compared to the Building Regulation baseline
- Explore options to improve the thermal efficiency of the building through use of alternative glazing, double, triple, or vacuum glazing should be carefully considered. Upgrade or replacement of existing should look to replicate the form of original windows as closely as achievable.



Image 2: Solar Panels



Image 3: Heat Pump

## Embodied Carbon

2.26 Embodied carbon refers to emissions associated with the manufacture and use of a product. In the case of planning, this means the carbon emissions associated with extraction, manufacturing, transporting, installing, maintaining, and disposing of construction materials and products throughout the lifecycle of a building or infrastructure – essentially, embodied carbon is built into the fabric of building. As the energy use of buildings and infrastructure is decarbonised, the emission from embodied carbon becomes increasingly significant and important to tackle. CO<sub>2</sub> emissions from unregulated energy use and potential carbon “benefits” from re-use of building components at the end of its useful life are covered by Whole Lifecycle Carbon Assessments.

2.27 Developments should seek to minimise emissions from embodied carbon by using more resilient materials that will last longer and that are produced via a more efficient construction processes. Adopting these changes will reduce expenditure as well as maintenance, repair, and replacement costs. In order to assess embodied carbon in a development, a whole-building life-cycle assessment (WBLCA) can be used, but other tools can be included to supplement this as a first step. To get an idea for the carbon footprint of different materials it is advised to refer to the [Bath University's Inventory of Carbon and Energy \(ICE\) toolkit](#), which is a well-respected source of embodied carbon data. The GLA has also

drafted guidance on Whole Lifecycle Carbon Assessments: [Whole Life-Cycle Carbon Assessments guidance | GLA \(london.gov.uk\)](#)

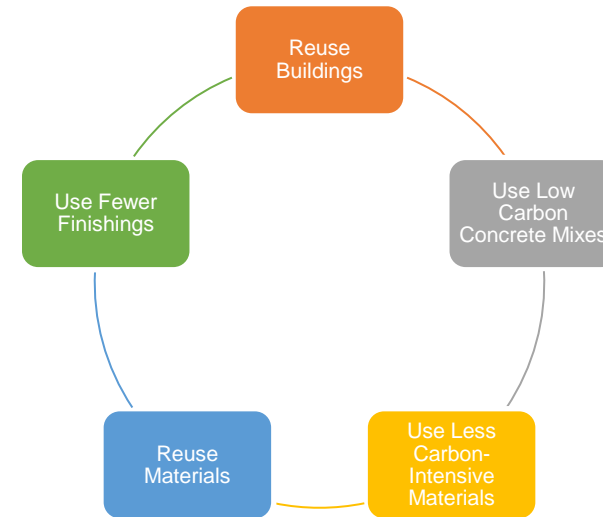


Figure 10: Whole Lifecycle Carbon

**2.28 Reuse Buildings** - Renovation projects usually save between 50–75% of embodied carbon emissions compared to constructing a new building. If the foundations and structure are already preserved, most of the embodied carbon will already be there and this drastically reduces new emissions.

**2.29 Use low-carbon concrete mixes** - Concrete can be the biggest source of embodied carbon for a new site, but lower-carbon concrete is easy to develop. By working with structural



engineers, options include fly ash, slag, calcined clays or lower-strength concrete where possible.

**2.30 Use less carbon-intensive materials** - Aluminium, plastic and foam insulation all has high carbon footprints so try to use alternatives or use them sparingly if you can. A wood structure is a good alternative to one of steel and concrete for example, and straw, hemp, and wool are renewable options for insulation.

**2.31 Reuse materials** - Second-hand materials such as brick, metal, wood and even broken concrete can make a big difference to embodied carbon emissions. Salvaged materials have a lower carbon footprint as the carbon used to make them has already been spent. For example, steel that's brand new has an embodied carbon footprint five times greater than recycled content steel.

**2.32 Use fewer finishings** – By using structural materials for the finishing touches less material is required and embodied carbon can be reduced. Polished concrete slabs make a good alternative to carpet or vinyl and unfinished ceilings can significantly cut emissions.

## KP8 Key principles – What you CAN do

### All developments

- Minimise the effect of embodied carbon in development using the measures set out in this chapter.
- Prioritise materials that are reused, reclaimed or natural from local areas and sustainable sources and that are durable. If not available, use materials with a high recycled content. Use the following material hierarchy to inform material choice particularly for the building structure.
  1. Natural and renewable materials e.g., timber
  2. Concrete and masonry
  3. Light gauge/Cold rolled steel
  4. Hot rolled steel
- Ask manufacturers for Environmental Product Declarations (EPD) and compare the impacts between products in accordance with BS EN 15804.
- Allow for flexibility and consider how a layout may be adapted in the future.
- Design buildings so that maintenance can be carried out easily.
- Consider disassembly to allow for reuse at the end of life of the building.
- Create material passports for elements of the building to improve the ability of disassembled elements to be reused.

## Water efficiency

2.33 All water companies serving London are located in areas classified as seriously water stressed. Climate change means London is already experiencing periods of drought, higher than average temperatures and more severe hot weather events. This, with Hammersmith's increasing population, means that we risk water restrictions being imposed unless we all reduce water consumption.

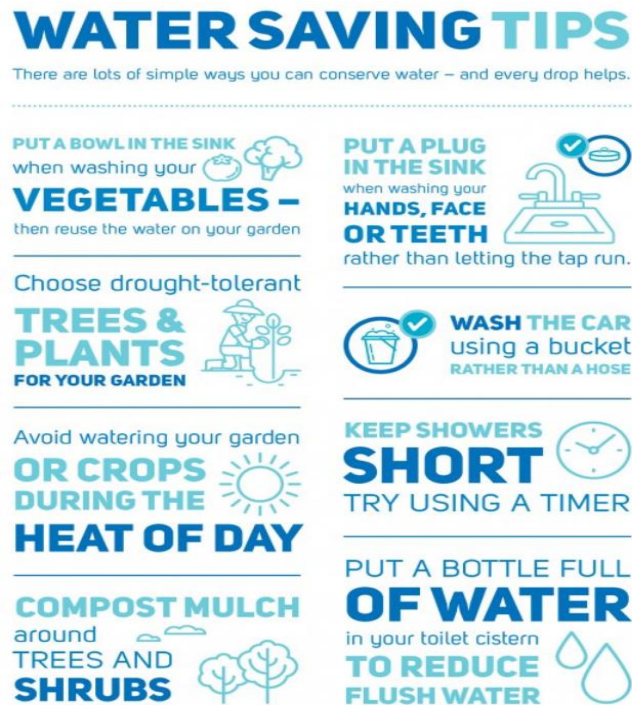


Figure 11: Water saving Tips

Appliance / Fitting	AECB Good Practice Fittings Standard
Showers	6 to 8 l/min measured at installation. Mixer to have separate control of flow and temperature although this can be achieved with a single lever with 2 degrees of freedom (lift to increase flow, rotate to alter temperature). All mixers to have clear indication of hot and cold, and with hot tap or lever position to the left where relevant.
Basin taps	4 to 6 l/min measured at installation (per pillar tap or per mixer outlet). All mixers to have clear indication of hot and cold with hot tap or lever position to the left.
Kitchen sink taps	6 to 8 l/min measured at installation. All mixers to have clear indication of hot and cold with hot tap or lever position to the left.
WCs	≤ 6 l full flush when flushed with the water supply connected. All domestic installations to be dual flush. All valve-flush (as opposed to siphon mechanism). WCs to be fitted with an easily accessible, quarter turn isolating valve with a hand-operated lever. Where a valve-flush WC is installed, the Home User Guide must include information on testing for leaks and subsequent repair.
Baths	≤ 180 litres measured to the centre line of overflow without allowing for the displacement of a person. Note that some product catalogues subtract the volume of an average bather. A shower must also be available. If this is over the bath then it must be suitable for stand-up showering with a suitable screen or curtain.

Figure 12: Water Standards (Association of Environment Conscious Building)

## KP9 Key Principles - What You MUST Do

### All Development

- Demonstrate adequate water and waste water capacity and include water efficient fitting/appliances in line with London Plan Policy SI5.
- Meet Part G Optional Building Requirements in the Building Regulations (residential development), achieving internal mains water consumption of 105 litres or less per head per day

### Commercial Development

- Achieve at least the BREEAM excellent standard for the 'Wat 01' water category 160 or equivalent.

### Major Developments

- Major developments and high water use developments must include other measures such as rainwater harvesting and greywater re-use. Aim to achieve maximum water credits in a BREEAM assessment, or best practice level Association of Environment Conscious Building (AECB) water standards (see table above).



Image 4: Fitting a water meter

2.34 Greywater recycling systems collect the water you've used in your sinks, dishwashers, showers and baths, and then clean it up and plumb it straight back into your toilet, washing machine and outside tap. Refer to British Standard BS8525-1:2010 (Greywater Systems Code of Practice) .

2.35 It is relatively cheap to install a greywater system in new buildings. For residents, the easiest time to is likely to be when you are carrying out an extension to provide new bathroom, or renovating an existing bathroom. Washing machines are typically the easiest source of greywater to reuse because greywater can be diverted without cutting into existing plumbing.



*Figure 13: A 190 litre water butt: By installing a water butt you could also cut your carbon footprint as each household has half a tonne of water treated and pumped to their door every day! (Waterwise)*



### KP10 Key Principles – What You CAN Do

- Minimise consumption in all development including extensions, ideally below the London Plan target of 105L per person /per day for internal use. Aim for 80L pp pd.
- Include water efficient fittings and appliances.
- Take a whole property approach - refitting all kitchen, bathroom and cloakroom appliances to at least AECB standards.
- Fit a water meter to help you reduce consumption.
- Incorporate measures such as smart metering, water saving and recycling, and retrofitting to help to achieve lower water consumption rates and to maximise future proofing.
- Reduce water consumption outside the property by:
  - ▶ Fitting a water butt to capture rainwater for watering the garden. These do not need planning permission but should be discretely sited particularly in conservation areas.
  - ▶ Choosing plants which are hardy and drought-resistant to avoid the need for watering. Adding mulch to all planted areas can help retain moisture. The RHS has produced a useful [guide](#) to gardening and climate

## Transport and Movement

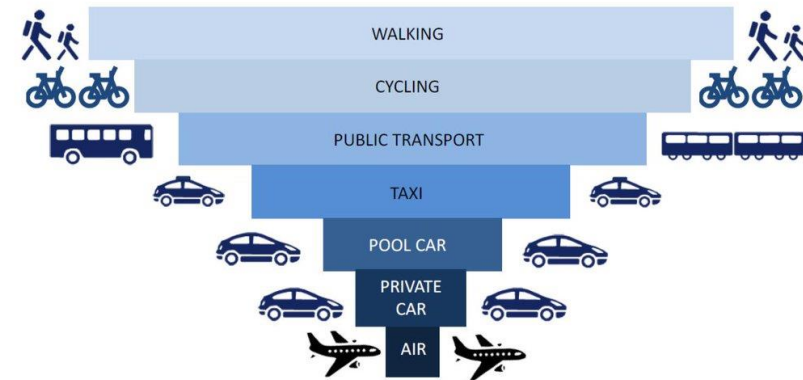
2.36 Vehicle emissions contribute to the increasing concentration of gases that are leading to climate change. The principal greenhouse gases associated with road transport are carbon dioxide (CO<sub>2</sub>), methane (CH<sub>4</sub>) and nitrous oxide (N<sub>2</sub>O). Road transport is the third largest source of UK greenhouse gases, and is responsible for 16% of the borough's emissions. Freight accounts for 28% of fuel use, with the remaining 72% from personal travel predominantly car usage, as opposed to public transport (buses, 9%) Reducing the need to travel and making sustainable travel choices is a priority.



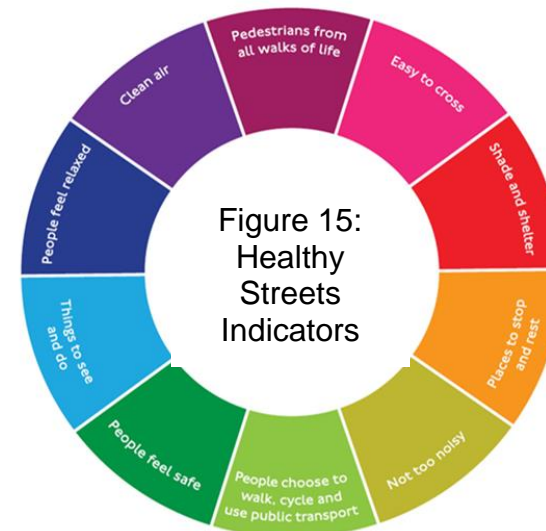
Image 5: Cycle route Hammersmith Broadway

2.37 A well designed, safe and accessible public realm can make walking and cycling an attractive option and encourage switching from private cars – particularly school travel and other local short journeys. This will benefit air quality,

overheating from road surfaces and running engines, and reduce surface water flooding.



**Figure 14 above: The Transport Hierarchy:** Prioritise the modes of transport in the order they appear in the transport hierarchy and promote 'Active Travel' principles.



## KP11 Key Principles – What You MUST Do

### All Development

- Prioritise reducing the need to travel.
- Focus on achieving high-quality public realm which:
  - ▶ embeds Healthy Streets principles;
  - ▶ facilitates Active Travel; and
  - ▶ takes on board Healthy Streets Approach 'Access for All', walking and cycling in line with the London Plan
- Provide an Active Travel Strategy
- Make the most effective use of land, reflecting its connectivity and accessibility by existing and future public transport, walking and cycling routes.
- Ensure that any impacts on London's transport networks and supporting infrastructure are mitigated.
- All development to align with London Plan and cycle parking standards

### Major developments

- Promote sustainable travel choices.
- Integrate high quality transport infrastructure with consideration of and connection of walking and cycling with public transport connections beyond the site
- Take on board the Healthy Streets Approach including in Transport Assessments
- Create direct connections to existing communities and facilities
- Innovative and future flexible approaches to parking and deliveries: promote 'last mile' logistics and electric service vehicles in mixed use and commercial developments
- A full and comprehensive Transport Assessment and Travel Plan will be required to support the proposals, with a separate Inclusivity Statement in line with London Plan policy D5



Image 6: Active travel connections



Image 7: Electric van at charging point London





Image 8: Secure cycle parking with green roof

## KP12 Key Principles – What You CAN Do

### Major developments

- Provide facilities to encourage cycling, such as secure parking and cycle storage.
- Provide electric car charging points (EVs) in car parking spaces to encourage a switch to low emission electric vehicles.

### All developments

- Replacing parking areas and other hard surfaces with permeable surfacing, and planting trees and soft landscaping can reduce surface water flooding in heavy rainfall, and help cool the local environment during heatwaves
- Residential developments including new build, flats or existing homes should ensure any hard surface is permeable.  
Restore residential front gardens given over to parking (diagram)
- Provide cycle storage /parking - contact the council for advice if your property is in a conservation area

### Existing Commercial Uses and New Developments

- Provide a Green Travel Plan for Staff
- Encourage cycling by provide safe cycling storage, e-cycle charging points, lockers, changing space and shower facilities.
- Provide electric vehicle charging points and switch to electric fleet vehicles
- Switch to 'last mile' Logistics and Servicing
- Provide Cargo bikes

## Air Quality

2.38 London's poor air quality is directly related to transport emissions. Hammersmith & Fulham has declared itself an Air Quality Management Area, and the council has in place an Air Quality Action Plan, aiming to reduce traffic fumes (Nitrogen Dioxide -NO<sub>2</sub>) and particulates (PM<sub>10</sub>s). The emissions of most concern in H&F also contribute to climate change: Oxides of Nitrogen (NO<sub>x</sub>), as well as Particulate Matter, particularly the smallest particles (PM<sub>2.5</sub>, PM<sub>10</sub>).

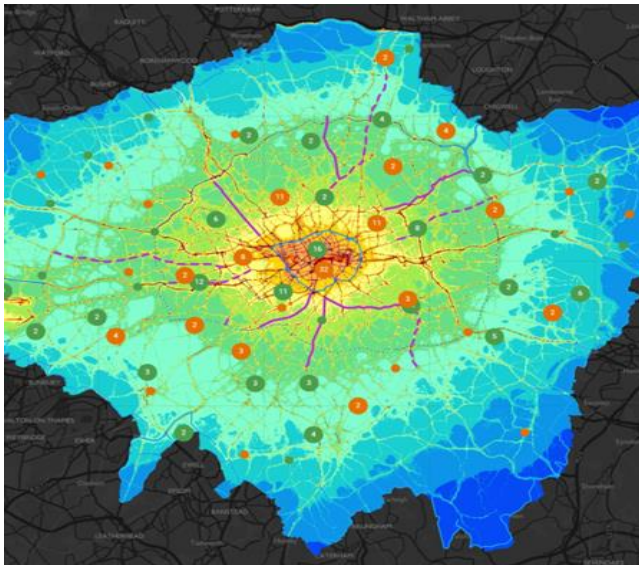


Image 9: Air quality in London

2.39 The main sources of emissions of NO<sub>2</sub> and PM<sub>10</sub> in new developments are vehicular traffic and heating (and cooling) systems which are likely to be based on combustion technologies. Construction and demolition, and the trend for stove burners are also a sources of particulates locally.

2.40 Industrial type developments can also be a source of emissions. Certain trees and vegetation can improve local air quality and it is important to retain and chose planting schemes which can help improve local air quality as well as reducing the effects of urban heating and heavy rainfall events.

### KP13 Key Principles – What You MUST Do

#### Major developments

- Carry out a preliminary Air Quality Assessment before designing the development to inform the design process

#### All developments

- Take on board London Plan policy SI1
- Be at least Air Quality Neutral
- Be designed to avoid increased exposure to existing air pollution and make provision to address local problems of air quality
- Demonstrate that heating and/or cooling systems have been selected to minimise CO<sub>2</sub> emissions.

2.41 Air quality is a material consideration in the assessment of planning applications. The London Plan's **air quality positive approach** links other policies in the London Plan, such as Healthy Streets, energy master planning and green infrastructure. The London Plan and Local Plan both have reducing the need to travel and promoting sustainable travel choices - walking and cycling - as strategic priorities. The Planning Guidance SPD sets out key principles for assessing and mitigating the relative impacts of transport and proposed developments on air quality. The London Plan aims to maximise the benefits to local air quality in and around large-

scale development. It requires information to be submitted as part of the application process to demonstrate what measures have been taken during the design stages to achieve the best possible outcomes for air quality. To reduce the impact on air quality during the construction demolition, London Plan policy requires proposals to demonstrate compliance with the Non-Road Mobile Machinery Low Emission Zone and reduce emissions from the demolition and construction of buildings.

2.42 It is considered best practice for businesses to have a travel plan and an active travel strategy. These encourage sustainable transport and active travel, to reducing local congestion and improving air quality, reducing commuter car journeys. Providing secure cycle storage is another practical way of positively encouraging cycle ownership and active travel. It is best to avoid stove burners which are a significant contributor to poor quality because of the high level of particulate pollution, even with approved fuels. Greening any parking spaces and planting hedges and other air quality-friendly vegetation can contribute to improving local air quality.

Appliance	Main Fuel Source	Local PM2.5 Emissions (g/MWh)	Pollution Rating
Air/Water Source Heat Pump	Renewable Heat from Air/Ground/Water	0	Low
Electric boiler	Electricity	0	Low
Gas Fired Boiler	Gas	0.72	Moderate
Oil Fire Gas Boiler	Oil	16	Moderate
Pellet Fired Boiler	Wood	216	High
<b>ClearSkies Stove-Level 5</b>	Wood	235	High
<b>Clearskies Stove Level 4</b>	Wood	285	High
<b>DEFRA Ecodesign Stove</b>	Wood	335	High
Non DEFRA exempt Stove	Coal, Wood	2660	Very High
Solid Fuel Open Fire	Coal, Wood	2950	Very High

## KP14 Key Principles – What You CAN Do

### Make sustainable travel choices:

Positively encourage cycling -facilities and secure parking

Householders- Replace any car parking in front gardens

Install secure cycle parking

Commercial and businesses – use of cargo bikes, electric fleet and 'last mile logistics'

*These principles apply to all development including those which do not require planning permission*

### Avoid local air quality pollution from demolition and construction:

*Major planning applications* will need to demonstrate how the Mayors Supplementary Planning Guidance: 'Control of Dust and Emissions' has been addressed,

Builders and contractors should be members of the Considerate Constructors scheme

### Reduce CO2/PM emissions from buildings:

Aim for the most sustainable way of heating your home or commercial building, as shown in figure xx.

**Retain trees:** contact the council for approval to prune or remove a tree in a conservation area or is protected by a Tree Preservation Order

### Planting improves air quality:

By planting up more of our surrounding surfaces such as walls, roofs, buildings and fences around our gardens we can substantially reduce harmful particulates that pollute the air



## Ecology, Biodiversity and Green Infrastructure

2.43 Prior to its climate emergency declaration, H&F has pursued its ambition to become the greenest borough. Since 2016 it has worked with resident-led biodiversity, parks and air quality commissions, followed by the 2018-22 business plan covering improvements to habitats and reducing pollution.

2.44 Hammersmith and Fulham is heavily urbanised, with only 28% of land vegetated and 12% canopy cover compared to London-wide averages of 43% and 21%. Whilst it is a densely built-up borough, there are also many areas of good quality habitats including 'blue infrastructure' along the River Thames. The borough offers a fantastic opportunity to provide for 'greening' and nature conservation even when space and resources are limited.



Image 10: Planting under Hammersmith Flyover

2.45 Green infrastructure includes parks, playing fields, trees, allotments and private gardens. Open spaces and biodiversity have an important role in mitigating the effects of climate change and the Council will protect and enhance green and blue infrastructure and opportunities for nature conservation and biodiversity through the planning process. Making space for nature is a key aim, and the Council will work to “retrofit” ecology into the built environment. Residents and businesses can help with small actions such as keeping plants on a balcony can attract pollinators such as butterflies and bees. Installing a garden pond can also be beneficial to nature.

2.46 Green infrastructure provides wide-ranging climate resilience and benefits, notably - managing overheating and improving local microclimates through cooling, sustainable drainage, and improved air quality. Protection and provision of new 'blue' infrastructure such as raingardens, lakes and ponds can also achieve these benefits.

2.47 **Urban Greening Factor** (UGF) - The London Plan policy G5 provides an Urban Greening Factor (UGF) model to calculate the appropriate provision of urban greening in new developments. Green and brown roofs, street trees, and additional vegetation are likely to be the most appropriate measures of achieving more urban greening because of the heavily built-up character of the borough.

2.48 **Biodiversity Net Gain** (BNG) Biodiversity Net Gain (BNG) is a national and London Plan policy approach to delivering measurable improvements for biodiversity by securing delivery of enhanced habitats in new developments.

## KP15 Key Principles - What You MUST Do

### All Development

- Include urban greening as a fundamental element of site and building design, and by incorporating measures such as high-quality landscaping (including trees), green roofs, green walls, and nature-based sustainable drainage.

### Major Developments

- Submit an assessment showing the UGF score. Higher standards are required for residential development. Aim to exceed the target UGF score of 0.4 in residential developments, and 0.3 in commercial developments.

### Smaller Sites/All Development

- Protect and maintain existing trees, including tree roots during building work.
- Apply the BNG mitigation hierarchy: avoidance of damage; minimisation of impact and compensation.
- Deliver 10% biodiversity net gain from November 2023 and secure this for 30 years.
- Avoid any harm to the ecological value of the protected areas of nature conservation in the borough.
- Integrate an uplift in green infrastructure at design inception stage - aim to achieve a maximum UGF score.



Image 11: Green roofs in Hammersmith



Image 12: Balcony Planting



## KP16 Key principles - What you CAN do

### All Development

- Exceed the Urban Greening Factor or exceed score for non-major development and currently exempt B2 and B8 (industrial and storage) uses.
- Maximise Biodiversity Net Gain
- Aim to increase soft planting and landscaping. Choosing appropriate trees and climate resilient plants in gardens and on balconies, parking areas and around commercial buildings can help mitigate climate change effects. Even planters on balconies can make a difference, mitigating against heat, and attracting insects
- Replace impervious hardstanding and paving and avoid replacing soft landscaping and lawns with paved areas.
- Wherever possible, instal a brown or green roof and green walls.
- Protect and maintain existing trees, including tree roots during building work.
- Residents and businesses can plant new deciduous trees to provide shade to windows in the summer and enable passive solar heating and maximising day light in winter reducing the need for artificial ventilation and heating. The Council's tree officers can advise on suitable species and tree maintenance.
- Plant native and climate resilient plants - the RHS and Thames Water have produced a useful [guide](#).
- Attract insects and pollinators: plant trees, install bird and bat boxes. Most of our bees are solitary and do not make colonies - help them by providing [bee hotels](#) in your garden, patio or roof.
- Refer to the London Greening [Design Guide](#) .

Image 13: Green parking space

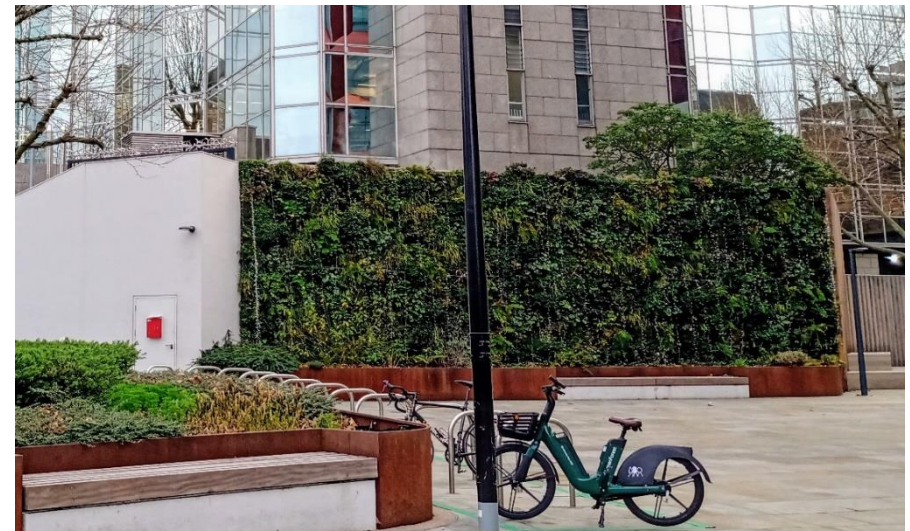


Image 14: Green Wall - Hammersmith W6

## Flooding and Sustainable Drainage

2.49 Risks from flooding are widespread across the borough. As a riverside borough we are at risk from flooding from the River Thames. Flood defences such as the Thames Barrier and our local river walls provide the currently required level of protection but sea levels are projected to rise as a result of climate change and defences will need to be raised in the future. Even with defences in place however, flood risks cannot be removed completely and an extreme storm event or failure of defences could result in areas being flooded.

2.50 Surface water and sewer flood risks are also present across the borough and as recently as summer 2021, a large number of properties were flooded when a major storm occurred and rainfall overwhelmed the sewer system. People's homes and businesses were flooded, including basements where the drains backed up internally and sewer water flooded properties from inside by flowing out of toilets etc. Basements can also be susceptible to groundwater flows if not properly waterproofed. Climate change is projected to make more extreme weather events such as intense rainstorms more frequent. It is also important to minimise foulwater flows into the sewers by installing water efficiency measures where new kitchens/bathrooms etc are installed as part of new developments and extensions (see water efficiency chapter).

Image 15: Runoff and Sustainable Drainage





2.51 Wherever flood risks are present, this triggers the requirement to submit a Flood Risk Assessment with planning applications which assesses flood risks and provides details of appropriate mitigation measures to be included which minimise flood risks on site and include measures that make new buildings and extension more resilient to flood impacts. Information should also be provided on how Sustainable Drainage Systems (SuDS) will be incorporated to reduce the flows of surface water into the sewers, particularly during a major storm when there are higher risks of flooding.

2.52 Green features such as green roofs and walls, rain gardens and swales can provide multiple benefits for people and wildlife in addition to managing surface water, so these are preferred as part of a SuDS Strategy, as are rainwater harvesting measures where these are possible.

2.53 Where hard surfaces are required, the preference is for run-off to be managed without directing it into the sewer system if this can be avoided. This can be implemented by using permeable or pervious hard surfaces in designs for car parking areas or patios and hard landscaped areas for example, or by directing surface water into soft landscaped areas where it can infiltrate into the ground.

2.54 Guidance on conserving water use is also provided in the water efficiency chapter. Using water efficient fixtures and fittings and appliances in new developments and extended kitchens and bathrooms etc can help minimise foul water flows into the sewer system.

#### KP17 Key Principles – What you CAN do

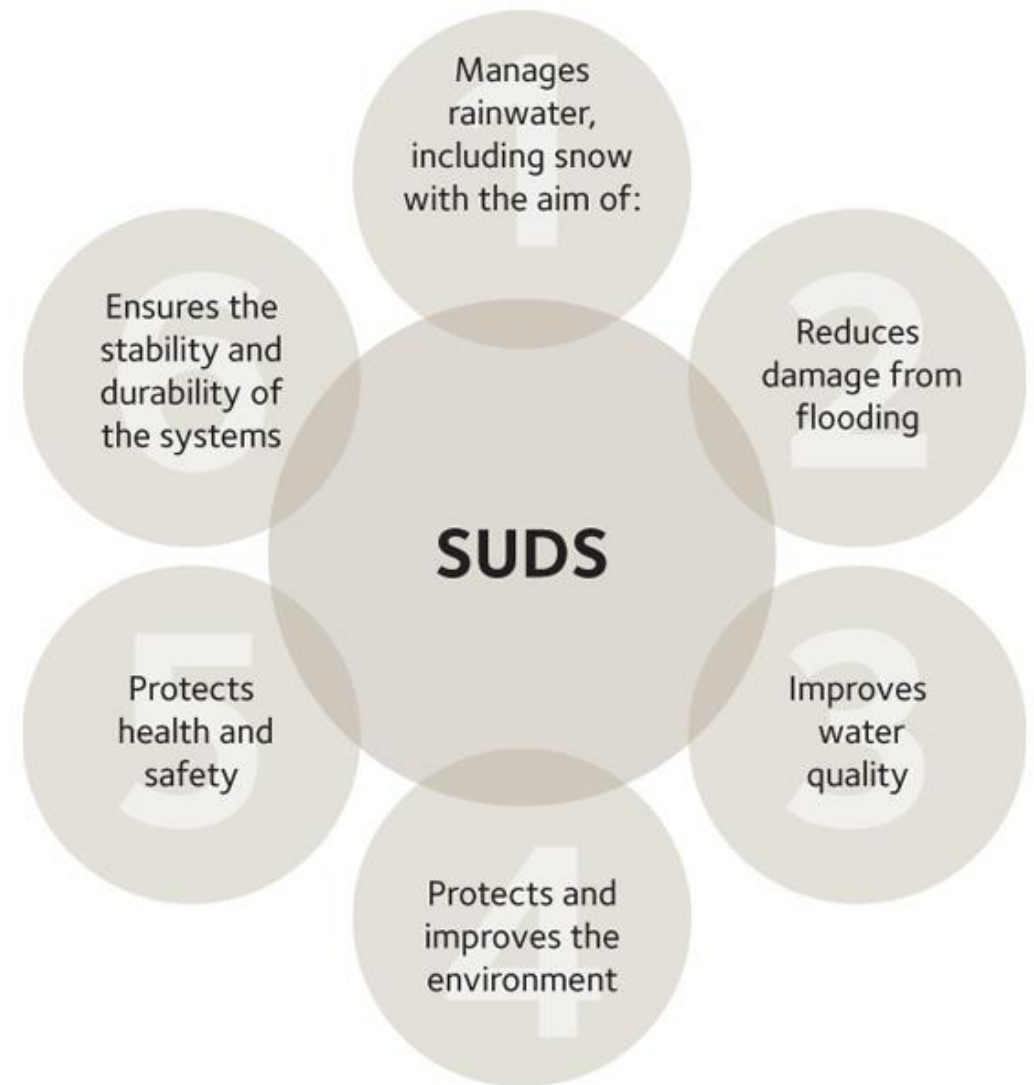
- Developments along the riverside which incorporate river wall defences should use the opportunity to raise the defences in line with Thames Estuary 2100 Plan principles
- Include rainwater harvesting systems to collect rainwater for re-use such as for toilet flushing or for irrigation of landscaped areas
- Plant trees and other soft landscaping features such as rain gardens and green walls to intercept rainwater and allow it to drain into the soil below
- Include living roofs (incorporating blue roof storage)
- Maximise the additional benefits that landscaped SuDS features can provide in addition to flood management by planting to encourage biodiversity



Image 16: Sustainable Drainage in Hammersmith

### KP18 Key Principles – What you MUST do.

- All planning applications must include a Flood Risk Assessment (FRA) where the site in question is located in an area identified as being at risk of flooding in Policy CC2 of the Local Plan
- FRAs should take account of the impacts of climate change on sea level rises and rainfall. For the latter, a climate change factor of +40% should be used when assessing future storm scenarios
- Sufficient information on the risks and mitigation measures to be included to meet national, regional and local planning requirements will need to be provided.
- Details of appropriate mitigation measures such as structural waterproofing and sewer surcharge protection measures for basement/lower ground floor development should be provided alongside other mitigation measures. Examples of these are provided in the council's Planning Guidance SPD.
- Follow the Drainage Hierarchy and provide details of proposed Sustainable Drainage Systems (SuDS). The level of detail required and the targets that are required to be met are different for major and minor schemes, with more stringent attenuation requirements set for major schemes
- Reduce any discharges of surface water to the sewer to the greenfield rate (majors). All other schemes should minimise discharges.





## Sustainable waste management

2.55 Appropriate waste management and disposal can significantly reduce carbon emissions. There are three key areas in the design and construction process of a development where waste-hierarchy principles must be applied to reduce this impact effectively. Proposals are encouraged to demonstrate how steps have been taken to prevent, reuse, recycle, recover waste as follows:

1. In the design of recycling storage in both new and existing buildings.
2. In the sourcing and selection of building and construction materials.
3. In the management of waste both throughout and after the construction process.

2.56 To ensure sustainable waste management in new constructions, applicants should consider the following:

- how waste will be minimised through design or through construction practice (including offsite/modular construction)
- how waste materials will be reused, recycled, or returned to suppliers to avoid disposal.
- how the development has been designed to facilitate reclamation of materials at deconstruction, and
- how demolition or other reclaimed materials have been incorporated into the new construction.

### KP19 Key Principles – What You MUST Do

#### All Development

- Provide facilities for the efficient separation and storage of waste in accordance with standards set out in the Hammersmith and Fulham Planning Guidance SPD [[www.lbhf.gov.uk/localplan](http://www.lbhf.gov.uk/localplan)].
- Comply with waste standards set out in the Hammersmith and Fulham Planning Guidance SPD [[www.lbhf.gov.uk/localplan](http://www.lbhf.gov.uk/localplan)] to ensure that waste can be collected safely and efficiently by the Council.
- Provide access to composting in all residential properties in the borough to encourage the opportunity to compost waste.
- Recycling facilities should be designed so that they are at least as convenient for residents as it is to dispose of non-recyclable refuse.
- Adequate waste and recycling storage should be provided in all residential developments in the borough to encourage and increase the opportunities for the recycling.
- Domestic extensions: Improving storage space for recyclable waste as part of a kitchen re-design or addition of a utility room.
- Commercial buildings: Provide clearly labelled bins and dedicated areas for waste recycling. Calculate predicted waste streams and provide sufficient, labelled waste storage in bin stores before waste collection.
- Large developments and flats: Use accessible, communal waste storage for the efficient storage of waste.

## Introducing the principles of a circular economy

2.57 The Council is supportive of applications that demonstrate how proposed development will conserve resources, increase resource efficiency and sustainable sourcing of materials. In doing so, applicants are encouraged to apply the principles of a circular economy to all development. A circular economy is one where materials are retained in use at their highest value for as long as possible and are then re-used or recycled, leaving a minimum of residual waste. In applying the principles of a circular economy, applicants should:

- Design waste out from the lifecycle of a building.
- Demonstrate how sustainable construction and operational waste will be managed and ensure that it is managed at the highest value.
- Design buildings so that structural elements are capable of lasting for the full lifetime of the building. If this is not possible due to for example anticipated change in requirements (e.g., IT infrastructure), those elements should be reusable, recyclable or dismantlable.
- Prevent premature building demolition by anticipating changes in requirements. Consider how buildings could be adapted to meet changing needs and how products and materials can be designed for assembly, deconstruction, reuse, or recycling at the end of their lifetime.

2.58 Further information about designing out waste and case studies on reducing construction and demolition waste is available on the Waste and Resource Action

Programme (WRAP) website: [www.wrap.org.uk](http://www.wrap.org.uk). Good practice for waste management is part of the Considerate Constructors Scheme: [www.ccscheme.org.uk/](http://www.ccscheme.org.uk/). The GLA has published draft guidance here: [Circular Economy Statement Guidance | GLA \(london.gov.uk\)](http://CircularEconomyStatementGuidance|GLA(london.gov.uk))

### KP20 Key Principles – What You CAN Do

#### Major Developments

- The Council will support the inclusion of a Circular Economy Statement for all major applications.



Image 17: Waste Storage with a green roof

## Heritage and Conservation Areas

2.59 Hammersmith and Fulham has a rich built heritage with around 500 listed buildings, 44 Conservation Areas and around 3000 locally listed Buildings of Merit.

2.60 Recognising the intrinsic and finite social, historic, cultural and economic value that our heritage assets provide, and following the NPPF approach which recognises that heritage assets require a considered approach in the management of change, we promote a balanced approach towards improved environmental performance in older buildings that uses sensitive methods of retrofit that ensures the preservation of character, appearance and significance.

2.61 Many historic buildings within the borough are not protected by specific heritage designations but because of their age and construction require care and consideration when seeking to improve energy efficiency.

2.62 **Conservation Areas** where planning permission is required to apply retrofit measures to buildings in Conservation Areas, the Council will only grant permission if the proposed development would preserve or enhance the

character and appearance of the area or if the public benefits of the proposal outweigh any harm to its significance and that there is a mechanism in place to secure the delivery of the public benefits.

2.63 **Listed buildings** are buildings and structures of special architectural or historic interest included on the statutory list. Listed Building Consent is required for any internal or external alterations which affect the special architectural or historic interest of a listed building. The Council has a statutory duty to ensure the preservation and enhancement of these assets.

2.64 **Locally listed buildings** are buildings and structures on the Council's Local List, locally referred to as Buildings of Merit and are considered by the Council to be of local importance due to their architectural, historical or townscape significance.

2.65 Listed Building Consent is not required for works to a locally listed building. However, when considering applications for planning permission in connection with proposals to retrofit locally listed buildings, the Council will only grant permission if the proposals would conserve the building, unless the public benefits of the proposal outweigh any harm to its significance.

### **KP21 Key Principles - What you MUST do**

The **two key areas of risk** which must be considered when upgrading older buildings to improve their environmental performance are:

1. Causing harm to the character, appearance, or significance of a heritage assets.
2. Causing conflicts between the existing traditional construction and structural fabric of a heritage asset through retrofit proposals. Traditional buildings were usually constructed to take up moisture from their surroundings and release it according to environmental conditions, which is in contrast to most modern buildings which are constructed with impermeable barriers. Poorly considered changes to building fabric, heating or ventilation can lead to longer term problems of moisture accumulation and damage to building fabric.

In all instances where a property features any heritage designations, it is recommended to engage in pre-application discussions at an early stage of any retrofit works.

### **Options for building adaptation**

*Below sets out some general guidance on the main opportunities to retrofit heritage properties and how to find the best interventions for your property. Please note that not all measures will be appropriate for all buildings.*

Table 1 – Building Adaptation		Building Type		
Intervention Type	Risks/Benefits	Listed Building	Building in Conservation Area	Locally Listed building (Building of Merit) or any other building
<p><b>Replacement or renewal/repair of windows</b></p> <p><b>Introduction of thermal single or double/triple glazing/vacuum glazing</b></p>	<p><b>Medium/Low risk</b></p> <p>Advice should be sought regarding potential ventilation and condensation issues.</p>	<p><b>Listed building consent required.</b> Thermal single glazing likely to be acceptable where windows are modern replacements and there is no historic glass.</p> <p>Double and triple glazing likely to be acceptable on modern areas of building due to thickness of glazing bars and reflective qualities of glass.</p> <p>In all cases, windows should match the existing, (as closely as possible), in terms of profile, reveal depth, horn detail, spacer bar and materials.</p>	<p>Planning permission only required for flats where new windows materially affect the external appearance of the building, i.e. changes to the window materials, frame size or glazing arrangement.</p> <p>Planning permission only required for a dwellinghouse (not flats) where the new windows and doors are not of a similar appearance to those used in the construction of the house, or the property is subject of an Article 4 Direction.</p>	<p>Planning permission will be required for flats where new windows materially affect the external appearance of the building, e.g. where the frame size changes; opening mechanisms change or materials for the window changes.</p> <p>Planning permission only required for a dwellinghouse (not flats) where the new windows and doors are not of a similar appearance to those used in the construction of the house, or the property is subject of an Article 4 Direction.</p>
<p><b>Introduction of secondary Glazing</b></p>	<p><b>Low risk</b></p> <p>Glazing should be aligned with existing sash frames to minimise visual impact.</p>	<p><b>Listed building consent required</b> if the works involve interventions to the fabric of the building e.g. creating notches in shutters.</p>	<p>Planning permission not required.</p>	<p>Planning permission not required.</p>

Table 1 – Building Adaptation		Building Type		
Intervention Type	Risks/Benefits	Listed Building	Building in Conservation Area	Locally Listed building (Building of Merit) or any other building
	Installation should minimise damage to building fabric including walls and shutters. Advice may be needed with regards ventilation and condensation.			
<b>Internal solid wall insulation</b>	<p><b>Medium risk</b></p> <p>Specialist advice should be sought for any building of traditional construction, due to potential ventilation and moisture issues.</p>	<b>Listed building consent required</b> if the changes would affect the special architectural or historic interest of the building.	Planning permission not required.	Planning permission not required.
<b>External solid wall insulation</b>	<p><b>High risk</b></p> <p>Specialist advice should be sought and breathable insulation used to limit future moisture</p>	<b>Planning permission and listed building consent required.</b> Unlikely to be granted on a listed building due to harm and impact on special architectural or historic interest.	<b>Planning permission required</b> where external wall insulation will alter the external appearance of the property or the property is subject of an Article 4 Direction.	<p><b>Planning permission required</b> where external wall insulation will alter the external appearance of the property or the property is subject of an Article 4 Direction.</p> <p>Sensitive approaches will be required which respond positively</p>



Table 1 – Building Adaptation		Building Type		
Intervention Type	Risks/Benefits	Listed Building	Building in Conservation Area	Locally Listed building (Building of Merit) or any other building
	and ventilation problems		Sensitive approaches will be required which respond positively to the existing context and the extent of any build-out is limited.	to the existing context and the extent of any build-out is limited.
<b>Draughtproofing</b>	<b>Low risk</b>  Specialist advice may be required with regards to ventilation and condensation issues.	Likely to be acceptable in most cases without listed building consent.  However, early advice should be sought ahead of any works taking place.	Planning permission not required.	Planning permission not required.
<b>Suspended Timber Floors</b>	<b>Medium risk</b>  Insulation should be breathable and air should be able to circulate i.e. by keeping airbricks uncovered.	<b>listed building consent may be required</b> depending on construction of floor.  Early advice should be sought ahead of any works taking place.	Planning permission not required.	Planning permission not required.

Table 1 – Building Adaptation		Building Type		
Intervention Type	Risks/Benefits	Listed Building	Building in Conservation Area	Locally Listed building (Building of Merit) or any other building
<b>Internal loft and roof insulation</b>  <b>(No changes to roof profile)</b>	<b>Medium risk</b>  Cold roof insulation generally most appropriate. Air should be allowed to still circulate. Insulation materials should be breathable.	Planning permission not required unless the external appearance or structure of the roof will be affected.  Listed Building Consent may be required if the works impact upon the fabric of the building.  Early advice should be sought ahead of any works taking place.	Planning permission not needed unless the external appearance of the roof will be altered.	Planning permission not needed unless the external appearance of the roof will be altered.
<b>Boiler Upgrade</b>	<b>Low risk</b>	<b>Listed building consent required</b> for any flue(s) and for any internal alterations. Flue(s) should be located in as visually discrete a location as possible, ideally out of public view and adjacent to existing downpipes.  The replacement of an existing flue (if lawful) with one to match is unlikely to	A flue is permitted development on a dwellinghouse (not including flats) subject to the height of it not exceeding the roof by more than 1m, and in a conservation area not fronting a highway or being on principal or side elevation.  Flue(s) should be located in as visually discrete location as possible, ideally to the rear and adjacent to existing downpipes.	A flue is permitted development on a dwellinghouse (not including flats) subject to the height of it not exceeding the roof by more than 1m, and in a conservation area not fronting a highway or being on principal or side elevation. Flue should be located in as visually discrete location as possible, ideally to the rear and adjacent to existing downpipes.

Table 1 – Building Adaptation		Building Type		
Intervention Type	Risks/Benefits	Listed Building	Building in Conservation Area	Locally Listed building (Building of Merit) or any other building
		require planning permission.	The replacement of an existing flue (if lawful) with one to match is unlikely to require planning permission.	The replacement of an existing flue (if lawful) with one to match is unlikely to require planning permission.
<b>Heating Controls</b>	<b>Low risk</b>	No consent or permission required.	No consent or permission required.	No consent or permission required.
<b>Ground Source Heat Pumps</b>	<b>Low risk</b>	<b>Listed Building Consent required.</b>	Permitted development for dwellinghouses (including buildings wholly consisting of flats)	Permitted development for dwellinghouses (including buildings wholly consisting of flats)
<b>Air Source Heat Pumps</b>	<b>Low risk</b>	<b>Listed building consent required.</b> External unit should be positioned in a visually discreet location. Should minimise effect on amenity of the area. i.e. by complying with noise standards. Seek advice from Council Environmental Health team for larger systems.	Permitted development for dwellinghouses or a block of flats, subject to certain restrictions. Should minimise effect on amenity of the area i.e. by complying with noise standards. Seek advice from Council Environmental Health team for larger systems	Permitted development for dwellinghouses or a block of flats, subject to certain restrictions. Should minimise effect on amenity of the area i.e. by complying with noise standards. Seek advice from Council Environmental Health team for larger systems

Table 1 – Building Adaptation		Building Type		
Intervention Type	Risks/Benefits	Listed Building	Building in Conservation Area	Locally Listed building (Building of Merit) or any other building
<b>Solar Photovoltaic systems (PV) and Solar thermal panels</b>	<p><b>Low risk</b></p> <p>May need a structural survey to ensure the roof structure can carry weight of panels. Replacement roof tiles needed in case these are broken during installation</p>	<p><b>Listed building consent required.</b> Should be in a discreet location, not visible from surrounding properties (e.g. internal valley roof or flat wall behind a parapet).</p>	<p>Planning permission generally not required, even on flats, unless panels protrude more than 20cm from the roof slope; are higher than the highest part of the roof (excluding chimney); and in a conservation area, on a wall which fronts a highway. Panels should also be 'sited so as to minimise its effect on the external appearance of the building and the amenity of the area'</p> <p>Planning permission may be required if the property is subject of an Article 4 Direction.</p>	<p>Planning permission generally not required, even on flats, unless it protrudes more than 20cm from the roof slope or is higher than the highest part of the roof (excluding chimney). It should also be 'sited so as to minimise its effect on the external appearance of the building and the amenity of the area'</p> <p>Planning permission may be required if the property is subject of an Article 4 Direction.</p>
<b>Living Roof</b>	<p><b>Low risk</b></p> <p>Specialist advice required regarding depth of substrate, planting and</p>	<p><b>Listed Building Consent and Planning Permission required.</b> Acceptability will depend on impact upon significance. May be acceptable on an existing</p>	<p>Planning permission required for flats. Planning permission for householders required where depth of build-up is greater than 150mm. However, where the build-up is less than 150mm and</p>	<p>Planning permissions required for flats. Planning permission for householders required where depth of build-up is greater than 150mm. However, for dwellinghouses where the build</p>

Table 1 – Building Adaptation		Building Type		
Intervention Type	Risks/Benefits	Listed Building	Building in Conservation Area	Locally Listed building (Building of Merit) or any other building
	balustrade heights. May need a structural survey to ensure the roof structure can carry weight of substrate.	flat roof in a discreet location such as behind a parapet wall.	<p>doesn't exceed the highest part of the existing roof this is likely to be permitted development, provided the works relate to a flat roof in a discrete location, rather than a pitched roof.</p> <p>Planning permission may be required if the property is subject of an Article 4 Direction.</p>	<p>up is less than 150mm and doesn't exceed highest part of the existing roof this is likely to be permitted development, provided the works relate to a flat roof in a discrete location, rather than a pitched roof.</p> <p>Planning permission may be required if the property is subject of an Article 4 Direction.</p>

# Case studies



## Case studies for retrofitting homes

### Victorian Terraced House, Battersea

- External Wall insulation – on the rear projection walls
- Internal wall insulation on the front wall – retaining architectural features
- Suspended floor insulation
- Loft insulation
- New double glazed wooden framed sash windows in period style
- High spec gas boiler and zoned heating controls
- Solar PV panels for electricity generation
- LED lights

[Case Studies | Ecofurb - Low carbon home renovations in London](#)



### Flat in Mansion Block, Clapham

- Internal wall insulation – retaining architectural features
- Suspended floor insulation
- Loft insulation
- Double glazed sash windows and draughtproofing in the period feature bay
- New double glazing at rear of property
- High spec gas boiler and heating controls
- Passive stack ventilation with heat recovery
- LED lights

[Case Studies | Ecofurb - Low carbon home renovations in London](#)



### Victorian House, Peckham

- External Wall insulation on the rear projection walls
- Internal wall insulation at the front, some of the rear and exposed sides
- Suspended and solid floor insulation
- Loft and flat roof insulation
- Double glazed panes put into period sash windows
- Replacement doors and windows, and thin double glazing installed in refurbished bay windows
- Through-the-wall heat recovery ventilation in wet rooms
- High spec gas boiler and zoned heating controls
- Solar thermal panels for hot water
- Solar PV panels for electricity generation
- LED lights

[Case Studies | Ecofurb - Low carbon home renovations in London](#)



## Case studies for new build homes

### Hartopp and Lannoy Point, Fulham

[Hartopp and Lannoy Point](#) is going to be built to '[Passivhaus](#)' classic standards – the most energy efficient standards of homes in the UK.

Designed to reduce heat loss and energy use, the development uses state-of-the-art technologies such as '**blue**' and '**green**' **roofs**, as well as air source **heat pumps** and **solar panels** to help clean our air locally while helping residents save on their energy bills.

The new energy efficient development is part of our efforts to make H&F the greenest borough in Britain and achieve our carbon net zero targets by 2030.



### Loudoun Road, Camden

[Loudoun Road](#) seeks to achieve the principles of Passivhaus. The challenge was to deliver this very high standard of **energy efficiency** on a large-scale apartment building. Walls became thicker to allow the necessary levels of **insulation**; homes are carefully oriented to gather natural warmth from the sun and reduce heating need; **fixed shading devices** to windows and **overhanging balconies** help prevent **overheating**; and an **effective air tightness** strategy includes triple glazed windows.



### Ashley Road, Haringey

Ashley Road proposals replace an operational refuse depot with 272 new homes. The design strives for the highest levels of **energy efficiency**; all buildings have been designed to connect to the District Energy Network and meet Passivhaus certification. **Passivhaus design** is one tool utilised to achieve as close to zero carbon as possible, alongside low carbon energy, **renewables**, and **low embodied carbon**. This will minimise energy costs for all residents.



## Case studies for non-domestic buildings

### Swindon's cultural quarter, Swindon

[Swindon's cultural quarter](#) proposal will transform a neglected part of town into a new arts district organised around high-quality public spaces. Long-term all-round sustainability underpins the emerging concepts, from financial resilience, environmental and societal perspectives, making this the UK's **first net zero carbon cultural quarter**.



### Oak Meadow Primary School, Wolverhampton

[Oak Meadow Primary School](#) in Wolverhampton was one of the first **PassivHaus** certified schools in the UK. Large windows allow for useful **solar heating** in the winter, while external shading limits overheating in the summer. Spaces are ventilated through openable windows and **ventilation panels** in the summer, and with the mechanical ventilation system with **heat recovery** in the winter.



### The Forge, Southwark

[The Forge](#), previously known as 105 Sumner St, is a 139,000 sq ft office development in LB Southwark. It aspires to a **net zero building** and will be the first commercial building that will be both constructed and operated in line with UKGBC's framework and associated energy performance targets. Construction has started and is due to finish in 2022.



# Checklist and Glossary



## Checklist

### Energy Efficiency

- ☐ Have you maximised opportunities for natural solar gain and natural daylight through passive design and attention to building location, orientation and form?
- ☐ Have you designed the fabric of the building to be ultra-low in energy demand, achieving KPIs for space heating demand (kWh/m<sup>2</sup>/yr) and energy use intensity (kWh/m<sup>2</sup>/yr)?
- ☐ Have you assessed ventilation provision and overheating risks and included mitigation measures?
- ☐ Have you carried out a whole building baseline assessment to inform any retrofit programmes?

### Low Carbon Heating and Renewable Energy

- ☐ Have you provided an Energy Assessment with your major planning application demonstrating how energy efficiency and renewable energy generation will contribute to meeting the London Plan requirement to be net zero carbon?
- ☐ For retrofitting projects, have you prioritised minimising energy demand first before looking at how energy will be supplied on-site by renewables?



## Embodied Carbon

- ☐ Have you implemented measures to minimise carbon emission within the construction process?

For GLA referable schemes, has a Whole Lifecycle Carbon Assessment been provided?

## Water Efficiency

- ☐ Have you provided adequate water and wastewater capacity and included water efficient fitting/appliances in line with the London Plan?
- ☐ Will your new commercial development achieve at least the BREEAM excellent standard for the 'Wat 01' water category 160 or equivalent?
- ☐ Will your development achieve water use that is below the maximum target of 105L pp/pd in line with London Plan Policy SI5?
- ☐ Has your major development/ high water use development included other measures such as rainwater harvesting and greywater re-use?

## Transport and Movement

- ☐ Have you provided a full and comprehensive Transport Assessment and Travel Plan with a separate Inclusivity Statement in line with London Plan policy D5?
- ☐ Have you embedded the Healthy Street Approach within your Transport Assessment?

- ☐ Have you provided for active travel - cycling and walking in line with Local Plan policy T3?
- ☐ Will your development align with London Plan and cycle parking standards?
- ☐ Will your development reduce the need to travel and promote sustainable travel choices?

#### **Air Quality**

- ☐ Have you carried out a preliminary Air Quality Assessment before designing the development to inform the design process?
- ☐ Have you carried out an Air Quality Assessment in line with Local Plan policy CC10?
- ☐ Will your development be at least Air Quality Neutral?
- ☐ Will your development take on board the London Plan's Policy SI1 including taking an air quality positive approach?

#### **Flooding**

- ☐ Have you prepared a Flood Risk Assessment (FRA) where the site in question is in an area identified as being at risk of flooding in Policy CC3 of the Local Plan?
- ☐ Have you followed the Drainage Hierarchy and provided details of proposed Sustainable Drainage System (SuDS)?

### **Ecology, Biodiversity and Green Infrastructure**

- ☐ Have you submitted an assessment showing the Urban Greening Factor (UGF) score?
- ☐ Have you applied the 10% minimum requirement of Biodiversity Net Gain (BNG) to the proposed development?
- ☐ Have you included urban greening as a fundamental element of your site and building design?
- ☐ Will your development integrate an uplift in green infrastructure at design inception stage to achieve a maximum Urban Greed Factor (UGF) score?

### **Sustainable Waste Management**

- ☐ Have you provided facilities for the efficient separation and storage of waste in line with Chapter 19 of the H&F Planning Guidance SPD?
- ☐ For GLA referable schemes, has a Circular Economy Statement been provided?

### **Heritage and Conservation Areas**

- ☐ Have you engaged in pre-application discussions on retrofit works for development involving heritage designations?

## GLOSSARY

**Air Source Heat Pump** A renewable energy technology which uses the outside air to help heat (or cool) buildings. Heat Pumps are an energy efficient way of reducing carbon emissions.

**Air Quality Management Area (AQMA)** An area which a Local Authority had designated for action, based upon a prediction that Air Quality Objectives will be exceeded.

**Biodiversity** - is a measure of the range of living organisms within a habitat and can be maintained by conservation and preservation. It encompasses habitat diversity, species diversity and genetic diversity. Biodiversity has a value in its own right and has social and economic value for human society.

**Blue Roof** A roof that is designed to intercept and hold rainwater either for re-use or controlled release into the drainage system. They can be integrated with other living roofs such as green roofs.

**Building Research Establishment's Environmental Assessment Methodology (BREEAM)** is the methodology for measuring the environmental performance of nearly every land use, including schools, health care or bespoke uses.

**Brown Roof** - Roofs which have a layer of soil or other material which provides a habitat or growing medium for plants or wildlife.

**Carbon Dioxide:** A product of burning fossil fuels such as gas for heating, electrical power and petrol/diesel in motor transport. It is a 'greenhouse gas' directly linked to the increasing global temperatures.

**Carbon footprint** - the amount of carbon that our activities release is called our carbon footprint. Some activities are described as carbon neutral. These add no extra carbon dioxide to the atmosphere and have no effect on our carbon footprint. For example, walking or cycling to school

is carbon neutral. Other activities store carbon and so reduce it from the atmosphere. This also decreases your carbon footprint.

**Circular Economy** - a redefined approach to the economy which focuses on principles of designing out waste and pollution, keeping products and materials in use for as long as possible.

**Conservation – i.** Conservation preserves and protects organisms and their habitats, and so maintains biodiversity.

**Conservation – ii.** The process of maintaining and managing change to a heritage asset in a way that sustains and where appropriate enhances its significance.

**Decentralised Energy** – Power generation in the UK is still largely centralised with large power stations generating electricity which is distributed over large distances via the National Grid. Generating power on a

smaller scale and closer to the end user (i.e. decentralised), is much more energy efficient and can generate potential cost savings for users. Decentralised energy generation using Heat Pumps for example can help significantly reduce carbon dioxide emissions.

**Demolition Protocol** – A resource efficiency model showing how the production of demolition material can be linked to its subsequent specification and procurement as a high value material in new builds.

**Design and access statement** - a statement that accompanies a planning application to explain the design principles and concepts that have informed the development and how access issues have been dealt with.

**Designated heritage asset** - A World Heritage Site, Scheduled Monument, Listed Building, Protected Wreck Site, Registered Park and Garden, Registered Battlefield or Conservation Area designated as such under the relevant legislation.

**Embedded Carbon** - is the carbon dioxide (CO<sub>2</sub>) or greenhouse gas

(GHG) emissions associated with the manufacture and use of a product or service. For construction products, this means the CO<sub>2</sub> or Greenhouse Gases (GHG) emission associated with extraction, manufacturing, transporting, installing, maintaining and disposing of construction materials and products.

**Embodied Energy** – The total life cycle energy used in the collection, manufacture, transportation, assembly, recycling and disposal of a given material or product.

**Energy Assessment** – A report evaluating the energy use of a proposed development which shows how it has been designed to reduce carbon emissions in line with the council's Development Plan policies on tackling climate change. The assessment should show how energy efficiency measures, including passive design and low and zero carbon technologies such as decentralised communal energy systems and renewable energy generation will be implemented to reduce energy use and minimise CO<sub>2</sub> emissions.

**EV charging** - electric vehicles(EVs) can be cheaper to run, due to the lower

cost of electricity compared to petrol or diesel. Recharging at home (overnight) will normally result in the greatest cost savings. EV Charge points can be installed in homes with a garage or driveway, at workplaces, or in public places.

**Flood Resilient Design** – Can include measures such as putting living accommodation on the first floor, using flood-proof materials, incorporating non-return valves to stop surcharges from sewers entering properties, integration of flood barriers etc.

**Flood Risk Assessment** – Flood Risk Assessments (FRA) are required when a planning application is submitted in an area at risk of flooding. This requirement is set out in the Government's policy on development and flood risk as stated in paragraph 103 of the National Planning Policy Framework (NPPF)

**Green infrastructure:** The multifunctional, interdependent network of open and green spaces and green features (e.g. green roofs). It includes the Blue-Ribbon Network but excludes the hard-surfaced public realm. This network lies within the urban



environment and the urban fringe, connecting to the surrounding countryside. It provides multiple benefits for people and wildlife including flood management; urban cooling; improving physical and mental health; green transport links (walking and cycling routes); ecological connectivity; and food growing. Green and open spaces of all sizes can be part of green infrastructure provided they contribute to the functioning of the network as a whole.

**Green Roof** – A green roof is a roof of a building that is partially or completely covered with vegetation and a growing medium, planted over a waterproofing membrane. It may also include additional layers such as a root barrier and drainage and irrigation systems.

**Green Travel Plan** addresses a business' transport use and cover travel /employee travel in the course of business.

**Ground Source Heat Pump** – A heat pump that removes heat from the earth or ground water in cold weather and transfers it to the house through an underground piping system.

The process can be reversed in warm weather to transfer heat into the ground.

**Ground Water** – Water within soils and rock layers.

**Heat Network** A heat network distributes heat to several users, just as an electricity grid distributes power. Heat networks can play an important role in reducing carbon dioxide emissions from new developments.

**Heritage Asset** is a building, monument, site, place, area or landscape positively identified as having a degree of significance meriting consideration in planning decisions. Heritage assets are the valued components of the historic environment. They include assets identified by the local planning authority during the process of decision-making or through the plan-making process (including Local Listing).

**Highly Vulnerable Uses**- in relation to flood risk are considered to be as follows:

- police stations, ambulance stations and fire stations and command centres

and telecommunications installations required to be operational during flooding.

- emergency dispersal points.
- basement dwellings.
- caravans, mobile homes, and park homes intended for permanent residential use; and
- installations requiring hazardous substances consent.

**Inclusive design** creates an environment where everyone can access and benefit from the full range of opportunities available to members of society. It aims to remove barriers that create undue effort, separation or special treatments, and enables everyone to participate equally in mainstream activities independently, with choice and dignity.

**Last mile delivery** -is the movement of goods from out-of-town warehouses or suppliers to the final delivery address, such as homes or businesses. Last mile delivery/servicing is traditionally undertaken by small petrol or diesel vans has numerous negative impacts, including Switching to electric last mile delivery vehicles (commercial electric vehicles -EVs) can help avoid negative

impacts on climate change, and poor air quality.

**Living Roof** Another name for green roof

**Low-flow water fixtures** - reduce water usage.

**Major Development** has the same definition as contained in the London Plan. Major developments (applications decided by the London Boroughs) are defined as these:

- for dwellings: where 10 or more are to be constructed (or if number not given, area is more than 0.5 hectares); and
- for all other uses: where the floor area will be 1000 sq metres or more (or the site area is 1 hectare or more).

The site area is that directly involved in some aspect of the development. Floor space is defined as the sum of floor area within the building measured externally to the external wall faces at each level. Basement car parks, rooftop plant rooms, caretakers' flats etc should be included in the floor space figure.

**Non-major development includes minor and householder development** and extensions; small

sites delivering between 1-9 new dwellings, new non-residential buildings below 1000sqm, and changes of use of existing buildings involving less than 1000sqm of floorspace.

**Passive Solar Design** – This refers to the use of solar energy for the heating and lighting of buildings. Using this approach, the building itself or some part of it can take advantage of the heat/light energy provided by the sun.

**Passivhaus** - a quality assured standard and methodology for low energy buildings, which can help create buildings which use up to 90% less energy than standard practice for UK newbuild homes.

**Permeability** is the degree to which an area has a variety of pleasant, convenient and safe routes through it.

**Permeable Paving** – this allows rainwater to infiltrate the ground below. Examples include block paving laid with gaps around them where water can infiltrate or porous materials which allow water to pass through directly.

**Photovoltaic (PV) Cell** – Also known as a 'Solar Panel' -converts solar energy directly into renewable electricity and heat. Interconnected cells are encapsulated into a sealed module that produces a voltage.

**Particulate Matter (Particulates) PM2.5, PM10** – Fine particulate matter with a diameter of less than 2.5/ 10 microns

**Priority habitats and species:** The England Biodiversity List under section 41 of the Natural Environment and Rural Communities Act 2006 provides details of all Species and Habitats of Principal Importance

**Rainwater Harvesting** – Collecting water from roofs via traditional guttering and through down pipes to a storage tank. It can then be used for a variety of uses such as watering gardens or internally to flush toilets.

**Solar Panel** - see *Photovoltaic (PV) Cell*

**Strategic Flood Risk Assessment** – A study to assess the risk to an area or site from flooding, now and in the

future, and to assess the impact that any changes or developments on the site or area will have on flood risk to the site and elsewhere. It may also identify, particularly at more local levels, how to manage those changes to ensure that flood risk is not increased.

**Surface Water** – Rainwater lying on the surface or within surface water drains/ sewers.

#### **Sustainable Development –**

Development that meets the needs of the present without compromising the ability of future generations to meet their own needs.

#### **Sustainable Drainage Systems**

**(SuDS)** – An alternative approach to the traditional ways of managing rainwater runoff from buildings and other surfaces. SuDS covers the whole range of sustainable approaches to surface drainage management. SuDS can reduce the total amount, flow and rate at which surface water runs directly to stormwater systems or to rivers and other water courses.

**Transport Assessment.** A transport assessment is a comprehensive review

of all the potential transport impacts of a proposed development or redevelopment, with an agreed plan to mitigate any adverse consequence.

**Travel Plans.** Travel Plans are aimed at helping employees to use alternatives to driving to work – for example public transport, walking and cycling. Green travel plans also address business' transport use and cover travel in the course of business. Travel plans can make a major contribution to easing congestion, especially during the peak periods.

**Tree Preservation Order (TPO)** - is an order to protect one or more trees. Any works to these trees including pruning requires written approval from the Council.

**Urban Greening Factor-** is a tool within the London Plan to evaluate the quality and quantity of urban greening. It enables major developments to demonstrate how they have included urban greening as a fundamental element of design.

**Water Butt** - a large container for collecting and storing rain that can then

be used to water plants and usually attached to a guttering downpipe.

#### **Whole Life-Cycle Carbon (WLC)**

emissions are the carbon emissions resulting from the materials, construction and the use of a building over its entire life, including its demolition and disposal. A WLC assessment provides a true picture of a building's carbon impact on the environment.