

Chapter 5 - A City that utilises its resources with care, protects the air, water and soil and aims for net zero carbon

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Glossary

Built environment - Refers to aspects of our surroundings that are built by humans, that is, distinguished from the natural environment. It includes not only buildings, but the human-made spaces between buildings, such as parks, and the infrastructure.

Climate Change mitigation – Actions to reduce the impact of human activity on the climate system. Entails interventions to reduce the emission of greenhouse gases like carbon dioxide, or to increase their storage within ‘sinks’ (adapted from IPCC).

Circular Economy - Unlike traditional linear economy whereby materials and products are created, used and then thrown away, a circular economy promotes conservation of energy, reduction in waste and extending the lifetime of products through various means such as sharing, reusing, repairing, refurbishing and recycling existing materials and products for as long as possible.

Embodied Carbon – The carbon dioxide in producing materials, including the energy used to extract and transport raw materials as well as emissions from manufacturing processes. The embodied carbon of a building can include all of the emissions from the construction process and materials used throughout; as well as from deconstructing and disposing of it at the end of its lifetime (adapted from UCL fact sheet).

Micro-renewables - Small-scale non-commercial renewable energy installations such as a domestic solar panel array.

Net zero carbon – A situation where any emissions of carbon dioxide are balanced out by removal elsewhere – equating to no net increase (adapted from IPCC).

Retro-fitting – In the context of this chapter, retro-fitting describes improvement works to an existing building for the purpose of improving its energy efficiency (such as by making them

easier to heat or by replacing fossil fuel systems with renewable energy-based systems), or its resilience to climate change.

Renewable energy - Energy that uses technologies which generally rely on the elements (e.g., sunlight, wind, rain), biomass, or on generating energy from the earth itself.

Whole building approach – In the context of retrofitting, taking a Whole Building Approach means that improvements are informed by an understanding of how the entire building and the different materials that it is comprised of currently performs, considering issues such as air quality, damp management and ventilation. It involves selecting fabric improvements and other upgrades that complement each other to ensure the best results for the long-term sustainability of the building and health of occupants and avoiding problems of maladaptation, whereby improvement projects can have unintended, negative consequences (such as excessive moisture build-up, or inadequate ventilation).

5.1 The policies set out in the previous chapter are designed to preserve and enhance green infrastructure and our natural environment, support nature recovery, as well as to build the city's resilience to the changes in the climate that are already happening as a result of greenhouse gas (GHG) emissions (climate adaptation). This chapter sets out policies which seek to ensure new development comes forward in a way that does not further exacerbate climate change through additional carbon emissions and to support the significant reductions in emissions needed from the existing built environment over the coming years – also known as climate change mitigation – to help achieve net zero carbon. The second part of the chapter then deals with protection of various natural resources and ensuring that the development process mitigates its impact on the wider environment.

Net zero carbon development

5.2 In Oxford, the primary source of existing carbon emissions comes from the built environment, including buildings like homes and offices, as well as industrial and commercial uses. It is imperative that new buildings do not contribute further to this problem and that they are able to operate in a way that does not add additional carbon dioxide into the atmosphere. The Climate Change Act requires that the UK achieves net zero carbon emissions by the year 2050 and the City Council has set itself a local target of being a net zero carbon city by 2040. Whilst these targets establish an ultimate point by which net zero carbon status needs to be reached, in actuality, we need to deliver consistent and meaningful reductions in carbon emissions throughout that period if we are to avoid the most extreme impacts of climate change. For example, the Sixth Carbon Budget for the UK sets out that in order to achieve the 2050 target, there needs to be an 78% reduction in emissions by 2035, well in advance of local and national net zero targets.

5.3 As development planned for, and built, during the lifetime of this Local Plan will continue to be in use well beyond 2040 and 2050, it is crucial that it is brought forward in a way that is consistent with a net zero carbon future now. This means that buildings should be able to function without the need for further retro-fit to cut emissions at a later point and, in the meantime, do not contribute any additional emissions into the atmosphere which would

otherwise need to be removed in another way. Development should also be designed in a way that supports users to live their daily lives in a sustainable way. Naturally, there is cross over with other areas in the Local Plan, such as the design policies of chapter 6 and the policies of chapter 7 which seek to support sustainable/active modes of travel, as well as local amenities within walking distance of where people live. There are three key policies in this chapter that address the carbon footprint of the built environment itself: policy R1 addresses the performance of buildings once they are in operation and throughout their lifetime; policy R2 addresses emissions associated with the construction process; and policy R3 addresses the need for retro-fit of existing buildings in the city. The Technical Advice Notes (TANs) will expand on many of the requirements of these policies and are flagged where applicable, Appendix 5.1 also provides some useful external resources that can help applicants inform their design.

Net zero carbon buildings in operation

All new buildings should be net zero carbon in operation (carbon associated with construction is addressed in policy R2). At its simplest, to be 'net zero carbon in operation' means that energy efficiency is maximised and that what energy is being used within the building is sourced renewably, ideally generated onsite, so that the balance of carbon dioxide emissions associated with operation of the building is zero. Exemplary design may actually be able to demonstrate a negative carbon balance (i.e. offsetting more carbon dioxide than the development is producing, such as through installing renewable energy generation capacity that exceeds the needs of the development itself). Applicants will need to clearly demonstrate how all of the relevant principles/targets in this policy have been addressed through submission of an Energy and Carbon Statement.

The key source of emissions from buildings' operation is from energy use. Energy is used in a variety of ways depending on type of building but is primarily consumed for heating (and increasingly cooling), hot water, cooking and powering of appliances. The policy has been framed around the principles of the energy hierarchy and it is expected that all new development is designed with a fabric-first approach, i.e. the fabric of the building makes energy needs as low as possible (e.g., by being well insulated), in accordance with the energy hierarchy principles as set out in Figure 5.1.

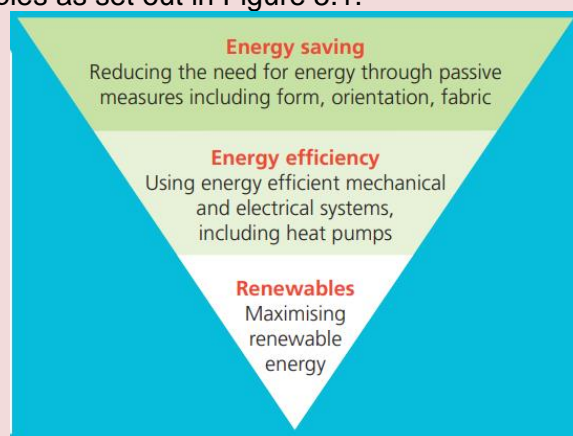


Figure 5.1: The energy hierarchy which should guide the design of all new development

Reduce energy use (energy saving)

The first step in the energy hierarchy is to reduce energy use as much as possible. Various

design measures can help reduce energy demands through the choice of materials and lighting, heating and cooling systems and the layout of the building. Energy efficient design will also reduce the amount of energy generation needed to meet energy needs, which can be particularly important on more constrained sites.

An Energy Use Intensity (EUI) calculation will be required within the Energy and Carbon Statement identifying the overall energy demand for the proposal and that it meets the target set in the policy. EUI is the measure of the building's energy use, which is calculated by combining energy demands from all sources, then dividing by the gross internal floor area (m²).

All energy calculations required for this policy, including in relation to EUI and space heating as detailed below, will need to be undertaken using an approved methodology. At the current time, the most appropriate methodology is considered to be the CIBSE TM54 methodology¹ and the Energy and Carbon Technical Advice Note (TAN) expands on this with additional guidance. Use of an alternative methodology should be agreed with the Council in advance. The TAN will be kept under review and updated to set out any additional approved methodologies.

Use energy efficiently (energy efficiency)

Once energy demands have been reduced as much as possible, the second step in the energy hierarchy is to use energy efficiently. The energy used for space heating is typically a significant proportion of overall energy use and is the key concern at this stage. A space heating target as part of the total EUI target, is set out in the policy.

Certain types of heating system run more efficiently than others, in terms of heat generated to power consumption, and the policy is not prescriptive in terms of technology choices. However, on many developments, the most suitable low/zero carbon technology to meet heating/cooling needs is likely to be heat pumps as they are particularly efficient in terms of electricity used and heat generated and can help to reduce overall EUI for a building. On larger developments, communal and district heating/cooling systems, such as heat networks, may be the appropriate choice; these systems should be designed in a way that does not rely on fossil fuels as their main heat source.

Meet energy needs through renewables

To be net zero carbon in operation, proposals will need to demonstrate that all energy needs are being met without relying on fossil fuels, and this energy should ideally be generated onsite. Increasing levels of decentralised energy generation through onsite micro-renewables such as solar PV is an important step in moving our energy systems to net zero carbon. This also helps to reduce strain on the central energy network (which will be subject to increasing demands as we switch to electric technologies like electric vehicles and heating) and improve energy security in general. Technology choice will depend upon the specifics of the site and the local context, rooftop solar PV is likely to best suited to many new developments though is not a requirement. Design and siting of technology on buildings should be guided by local context. Where there are wider sensitivities, such as risk

¹ LETI operational modelling guidance includes more info on the TM54 methodology:
https://www.leti.uk/files/ugd/252d09_68369f33aca74bf49edaea562eca81d5.pdf

of harm to heritage assets, negative impacts that might otherwise make an application unacceptable can be reduced or avoided through careful design choices or locating technologies on less visually impactful facades.

The Energy and Carbon Statement will need to clearly demonstrate that the development's total EUI figure is being met through the equivalent onsite energy generation. Use of battery storage is encouraged in order to meet needs throughout the day and to reduce reliance on grid energy even at times of low generation resource. Where operational energy needs cannot be fully met onsite, applicants should seek to secure additional offsite generation to offset the residual need. The Council will look to ensure that this offsite provision is secured through an appropriate legal agreement. As such, evidence will need to be submitted to show that there is capacity for the required renewable installation there; that this can be installed in an appropriate time to begin generating energy to offset the development's unmet energy needs; and, where the offsite location is not in direct control of the applicant, a formal agreement between the landowner and the applicant showing that they are happy to accommodate these installations. The offsite energy generation should be able to offset the remaining energy demand that is being sourced from the wider energy grid and where it is not being met through renewables on the development itself.

Energy offsetting

Energy offsetting is the least favourable approach to delivering net zero carbon development; however, the Council accepts that there may be circumstances where certain requirements in this policy may not be technically feasible and may require an element of offsetting to deliver net zero carbon through mitigating onsite energy demand elsewhere as a last resort. For example, particularly energy intensive uses that may not be able to meet all energy needs onsite and are unable to secure off-site renewable installation themselves as an alternative.

Before offsetting will be considered acceptable, the onus will be on the applicant to robustly justify that the earlier steps in the energy hierarchy *have been exhausted* and onsite/offsite energy generation is not possible to meet the development's EUI figure. Only then, will payment be accepted into the Council's offsetting fund to mitigate remaining energy use that cannot be met through establishing new renewable generation capacity directly through the proposed development. This would be secured through a legal agreement/S106. The preference will be to utilise offset funds to deliver additional renewable energy production or energy saving measures elsewhere in the city (also known as 'insetting').

Conversions, extensions and change of use

Proposals for conversions, extensions and change of use (where they include works to the fabric of the building to facilitate this) that would require planning permission will be expected to demonstrate that the design process for the new elements of the building have followed the principles of the energy hierarchy where relevant. The specific targets set out for energy use, generation and monitoring (criteria 2, 3, 5 and 6 in the policy) do not apply. However, where development would result in the creation of a self-contained dwelling(s)/or non-residential units, all policy requirements will need to be met, unless it can be demonstrated that this would not be technically feasible (e.g., such as without imposing further works to the remainder of the building).

Policy R1 – Net Zero buildings in operation

All new buildings should be net zero carbon in operation. This must be demonstrated through submission of an Energy and Carbon Statement that details how all the criteria below have been met:

1. Developments have been designed in accordance with the energy hierarchy. Applications should demonstrate how design has methodically followed the steps in the hierarchy, firstly through reducing energy use; using energy efficiently; and then, meeting all energy needs through renewables sources, ideally generated onsite, or else offsetting as a last resort.
2. A total Energy Use Intensity (EUI) figure for the development has been provided, calculated using an approved methodology as set out in supporting text. Developments will not be permitted where they exceed the following Energy Use Intensity targets:
 - Residential: 35 kwh/m²/yr
 - Non-residential: 70 kwh/m²/yr
3. The proportion of the development's total EUI associated with space heating is no more than 20 kwh/m²/yr.
4. No fossil fuels are being directly utilised in the operation of the development (e.g., no gas used for heating and cooking).
5. All energy needs (matching the development's total EUI figure) will be met through onsite renewable energy generating technologies in the first instance, accompanied by energy storage where possible. Where the total energy need cannot be met onsite, the remaining energy balance should be met through installation of sufficient additional renewable generation at a location offsite. In these circumstances, it will need to be demonstrated in the Energy and Carbon Statement that offsite provision has been fully secured and will be in operation upon completion of the development.

As a last resort, where the above steps have been fully explored and net zero carbon still cannot be fully delivered, offsetting may be accepted to mitigate any remaining energy demand that cannot be sourced renewably either onsite or through an identified offsite location. The Council will accept payment into the Council's offsetting fund that can be shown to fully offset this remaining energy demand, and this will be secured through an appropriate legal agreement/S106.

6. All new development must include information that specifies the approach to metering that will be adopted as well as proposed monitoring of the performance of the development to be undertaken post-completion (to ensure performance is in line with design specifications).

Proposals for conversions, extensions and change of use (where they include works to the fabric of the building to facilitate this) that would require planning permission are only expected to demonstrate accordance with criteria 1 and 4, unless they would

result in the creation of a self-contained dwelling or non-residential unit, in which case all criteria apply.

The City Council will expect that, having worked through requirements 1-6, Energy and Carbon Statements demonstrate compliance with the above criteria; however, a case for anything short of full compliance will be expected to be clearly justified as follows:

- 1. Full details of where a criterion cannot be met will be provided and justified within the Energy and Carbon Statement with explanation of the reasonable attempts to meet it provided; and**
- 2. clarification that all other criteria are met or exceeded; and**
- 3. the proposal is overall net zero carbon in operation (meaning no reliance on fossil fuels and including use of offsetting only as a last resort).**

Embodied Carbon in the construction process

There is an embodied carbon content within the materials used in the built environment and associated with the construction, maintenance, redevelopment and demolition processes. As energy use of developments becomes net zero carbon when they are in operation, the embodied carbon cost for constructing, maintaining and deconstructing buildings will become the primary source of carbon emissions associated with them making this an important issue to address too.

The lifetime of a typical building can be broken down into various life stages and the balance of embodied carbon associated with processes at each of these stages is a complex one and still subject to much research. Knowledge and understanding is better for the earlier design and construction stages prior to completion of the building, whereas understanding of embedded carbon associated with maintaining a building whilst it is in operation, or deconstructing it at the end of its life, is still emerging. As such this policy is primarily concerned with addressing **the construction stages** prior to building completion **(including sourcing/selection of materials)**, though many of the principles will apply at all stages and where possible designers are encouraged to consider impacts at these later stages.

Simple actions can help to reduce carbon embodied in the construction process. This policy sets out a number of high-level principles which will need to be applied to all scales of development. Applications will need to demonstrate how the design and construction process has been approached in light of each of these principles, setting out a sufficient level of detail that is proportionate to the size and scale of the development. Many of these principles are also beneficial in aligning with a circular economy, such as reducing waste and promoting re-use of materials wherever possible, which enable more prudent use of resources and protection of our natural environment.

Additional requirements for large scale new-build developments

Larger developments are likely to produce a higher proportion of emissions associated with construction processes due to their larger scale and typically higher material/resource use. As such, it is expected that applicants quantify their embodied carbon (associated with the material sourcing and construction stages prior to completion of the development). The Energy and Carbon statement should include this figure and be supported by submission of the assessment using a recognised methodology such as a

Whole Life Cycle Carbon Assessment. More details on recognised methodologies that applicants should choose from are included in the Energy and Carbon TAN.

Along with quantifying embodied carbon, applicants for major development are also expected to demonstrate what actions have then been taken to reduce carbon dioxide emissions in the construction process as much as possible – supported by figures for how much carbon dioxide has been reduced through these actions. The high-level principles set out in the first part of the policy could be used as a way to frame these actions.

Future direction of policy/Building Regulations/ and more guidance

It is envisaged that future Local Plans will seek to embed targets for embodied carbon in policy, unless this is superseded by targets set out in national policy/building regulations. As such, the requirements of this policy are intended as a stepping stone to building understanding and good practice within the building industry, supporting a shift to more rigorous reporting of embodied carbon in construction and driving the shift toward net zero carbon construction in future. Further detail and guidance on all requirements of this policy are set out in the accompanying Energy and Carbon TAN, which will be subject to regular updates whenever possible to reflect improved future guidance and understanding.

Policy R2 – Embodied carbon in the construction process

All developments are expected to demonstrate consideration of embodied carbon in the construction process and take actions to limit this as much as possible through careful design choices. Planning permission will be granted for proposals that demonstrate through their Energy and Carbon Statement that the following principles are embedded in design choices:

- a. Re-use of any existing buildings on a site has been robustly explored and demonstrated to be unfeasible before resorting to demolition.
- b. Waste generation has been minimised and re-use and recycling of materials has been maximised in the construction process, including using any demolition materials.
- c. The selection of construction materials has been informed by the carbon footprint associated with their sourcing and production (carbon footprint sought to be reduced wherever possible); use of materials that sequester more carbon than is produced in making them is prioritised where opportunities arise.
- d. The ways that materials are transported to site and processed during construction have been chosen to minimise the associated carbon emissions wherever possible.
- e. Design choices would allow buildings to be easily maintained, adapted and repurposed at the end of use/life.

Proposals for large scale new-build development (developments of 100 or more dwellings, or 10,000m² or more non-residential floorspace) will also need to be accompanied by details within their Energy and Carbon Statement that provide the following:

- a) a measurement of total embodied carbon associated with the construction process (including sourcing/selection of materials). A recognised methodology should be followed to determine these quantities, such as completion and submission of Whole Life Cycle Carbon Assessment.
- b) details of actions taken to reduce this embodied carbon as much as possible and the specific reductions in embodied carbon that have been secured through design process.

Where any future updates to Building Regulations (or other national policy) make embodied carbon requirements at a national level, the Energy and Carbon Statement should instead demonstrate how embodied carbon is being addressed in the context of that national legislation.

Retro-fitting existing buildings

The Council recognises the significant need to retrofit the existing built environment to address its impact on the climate. Retro-fitting existing buildings to net zero carbon through energy efficiency improvements will be essential if we are to mitigate our impacts on the changing climate. Equally, retrofitting has a role in facilitating adaptation of buildings to the changing climate and building in resilience to impacts like flooding and heatwaves to protect the health and wellbeing of occupants. Not only can improving and adapting these buildings help reduce their impact on the environment, but it can also ensure that carbon embodied within the materials of these structures remains locked up

by helping to extend their usable lifetimes for many years to come.

It is recommended that retro-fitting projects are undertaken as part of a 'whole building approach'. This means that retro-fit improvements are informed by a methodical assessment of how the entire building and the different materials that it is comprised of currently performs, considering issues such as air quality, moisture movement and ventilation. Fabric improvements and other upgrades are then selected that complement each other in order to ensure the best results for the long-term sustainability of the building and health of occupants. This can also help to avoid problems of maladaptation, whereby improvement projects can have unintended, negative consequences (such as excessive moisture build-up, or inadequate ventilation).

For all existing buildings which are not designated heritage assets, or within the setting of a designated heritage asset, the starting point in decision-making is to support retro-fitting measures that have been designed to secure demonstrable energy efficiency and/or climate adaptation improvements – particularly where this is in line with a whole building approach. This means that applications received which propose such measures should be approved, unless other policy/material considerations would make them unacceptable.

Traditional buildings and heritage assets

In relation to traditional buildings, including heritage assets (such as listed buildings and conservation areas), there are an additional set of considerations which need to be carefully thought about, thus the presumption in favour does not automatically apply. Nevertheless, retrofitting can be carried out sensitively and successfully, whilst preserving their unique historic character, and the Council will support this wherever possible where interventions have clearly been designed with appropriate consideration of these additional factors.

Many of these heritage assets are afforded statutory protection through the Listed Building and Conservation Area Act as well as great weight being automatically assigned through the National Planning Policy Framework to preserving the significance of these assets. This needs to inform the selection of retrofit measures. Equally, it is important that retrofit measures for traditional buildings have been informed by the whole building approach, which takes account of the way they have been constructed and how they perform. This will help ensure that the optimum interventions are selected for the building, without compromising the natural processes such as passive ventilation and free movement of moisture that the fabric of these structures often rely on. The policy sets out some principles to inform the approach taken to designing any intervention in order to get the best outcome from a proposal.

National policy sets out that harm to heritage assets should be mitigated as far as possible, and any residual harm must be justified by public benefits of the scheme that outweigh the harm (see policies HD1-HD6). Measures that seek to deliver carbon reduction through energy efficiency or provide adaptation to changing climate will be considered as a public benefit; however, this will not automatically override any harm to an asset. The City Council will need to consider the level of harm to the significance of the asset and make a determination as to whether or not this is outweighed by that public benefit where harm does occur.

Applicants are encouraged to review the additional guidance set out in the Heritage Retro-fit TAN which expands on many of these considerations/principles and seeks to illustrate the variety of approaches that could be tailored to specific site contexts.

Policy R3 – Retro-fitting existing buildings

The Council will support retrofit measures to existing buildings where they secure energy efficiency improvements or adaptation to changing climate. The expectation is that the interventions are selected in accordance with the steps of the energy hierarchy (reduce energy use, use energy efficiently, source energy renewably) as set out in Policy R1.

A whole building approach should be taken to the retrofitting of traditional buildings, including heritage assets, whereby applications will need to demonstrate how the following principles have been embedded in the design rationale:

- a. choices on interventions have been informed by a whole building approach which includes methodical assessment of the building’s heritage significance, its current performance in terms of energy efficiency and climate risk, its use (now and in future), its context, and the selection of suitable materials;**
- b. any harm to the heritage significance of the asset has been minimised and mitigated as much as possible through careful design choices and in line with requirements of policies HD1-HD6;**
- c. professional advice has been sought from historic environment and energy/climate experts to inform proposals where necessary/appropriate;**
- d. all required consents have been secured, or are in the process of being secured, such as Listed Building Consent or consent for works affecting TPOs.**

Measures that seek to deliver carbon reduction through energy efficiency or provide adaptation to changing climate will be considered as a public benefit in the balance against harm, although this will not automatically override any harm to an asset.

Natural resources

5.4 As well as carbon impacts of development in the city, there are a wide range of natural resources which need to be considered by new development. Natural resources such as the soil, air, and water are all important to health and wellbeing but also to the sustainable functioning of the wider natural environment that makes Oxford so special. As such, it is important that the development process considers these issues and mitigates its impact on them.

5.5 There are several policies in this section which deal with protection of different elements of the natural environment. Policy R4 addresses the issue of air quality, which is a key concern in the city due to ongoing issues from a range of sources (e.g., tail pipe emissions, burning of fossil fuels for heat, wood-burning stoves, as well as construction pollutants). Policy R5 and R6 deal with the quality of the land and its soils. Due to Oxford's long history of development, there are areas of the city which are likely to be affected by poor soil quality and the presence of contaminants that could be harmful for human health (particularly on sites of historic landfills), as such, policy R5 sets out expectations for how development should address potentially contaminated land to make sites safe for future occupants. Meanwhile, policy R6 sets out expectations for conserving and enhancing soil quality including protection of peat reserves which are located across the city and are important stores of both carbon and potentially valuable archaeological resources. Finally, policy R7 addresses wider impacts on amenity and environmental health and includes a range of potential risks which new development will need to consider and mitigate through careful design choices (e.g., noise and vibration as well as other micro-climatic issues such as wind drafts).

5.6 The issue of water quality is addressed via several interlinked policies across the Local Plan. New development has the potential for directly introducing a range of pollutants into water bodies where it is not appropriately mitigated, equally, once in operation, its users can influence nearby water quality through increased demand on water supplies as well as through output of pollutants which can be particularly harmful where this happens close to sensitive catchments. The risk of pollutants discharging into water bodies as well as impacts of new development on wastewater are part of the considerations for compliance with policy R7 (amenity and environmental health), but also of relevance are the requirements for limiting water use in new development in policy G9 Resilient Design and Construction as well as the incorporation of multi-functional green SuDS in policy G8 SuDS.

Air quality assessments and standards

Improving local air quality, mitigating the impact of development on air quality and reducing exposure to poor air quality across Oxford is key to safeguarding public health and the environment. Some people are more vulnerable to poor air quality because they are at a heightened risk of negative health outcomes due to existing ill health (defined as sensitive receptors).

The whole of the city has been declared an Air Quality Management Area (AQMA) and the City Council has produced an Air Quality Action Plan (AQAP)¹ which sets out a range of measures that will be required to improve air quality across Oxford. The AQAP includes a commitment to a more rigorous standard for Nitrogen Dioxide (NO₂) compared with national legal limits which is to be kept under review throughout the Plan period and it is important new development accords with this. Whilst air quality in the city continues to

improve, there are a number of areas of the city where exceedance of the local annual mean target for NO₂ occurs².

In 2022 a Zero Emission Zone (ZEE) pilot was introduced in the city centre with a view to expanding the ZEE over the coming years. The move away from vehicles which do not have an internal combustion engine alongside traffic measures to reduce the number of private vehicles driving across Oxford and the introduction of a workplace parking levy will all support the ambition to improve air quality across the city (see Chapter 7) as well as reduce carbon emissions from the transport sector. Policies in the Local Plan (R1 & R3) that seek to deliver net zero buildings for new development and support retrofitting existing buildings will also contribute towards improving air quality across the city as the need for fossil fuels to heat homes and other buildings reduces.

It is important that any negative impacts on air quality from new development are mitigated and that exposure to poor air quality is minimised or reduced (including emissions of NO₂ as well as other harmful pollutants such as particulate matter). The potential impacts upon air quality from new development must be considered at the outset to avoid the need for future site mitigation. Sensitive uses in particular, meaning those expected to host more sensitive receptors such as schools, nurseries, care homes and healthcare settings need to be located away from areas of poor air quality. This means site layout should be designed in such a way as to protect human exposure to high pollution, which could involve setting the development back from key sources of pollutants; placing habitable rooms away from, and avoiding installation of balconies near to, highest pollution areas; as well as use of buffering measures like planting.

Major applications will be expected to submit an Air Quality Assessment that fully considers the issue of air pollution, identifies negative impacts from the development and sets out how these will be mitigated. Further guidance on meeting the requirements of the policy is set out in Oxford City Council's Air Quality Planning Application Guidance Note and the most up to date Institute of Air Quality Management (IAQM)³ guidelines which applicants are expected to follow.

² These locations can be found at: www.oxonair.uk

³ Institute of Air Quality Management website: <https://iaqm.co.uk>

Policy R4 – Air quality assessments and standards

Planning permission will only be granted where the impact of new development on air quality is mitigated and where exposure to poor air quality is minimised or reduced as far as is reasonably practicable.

The design of new development (during construction and in operation) needs to consider the potential impacts upon air quality for current and new occupants. Sensitive uses such as schools, nurseries, care homes and healthcare settings, should be located away from areas of poor air quality as far as reasonably practical through careful site layout designed to protect human exposure to high pollution levels.

Air Quality Assessments (AQA) will be required for all major developments. Planning permission will only be granted for major developments where the AQA meets the following criteria:

- a) provides an assessment of the impacts of all the different sources of air pollution generated during the development's operational and construction phases, (including but not limited to transport, heating, dust generated from demolition/construction/earthworks activities); and
- b) has considered the cumulative impacts from other sources of air pollution in the local area where relevant; and
- c) clearly identifies any potential negative air quality impacts, including where these would compromise achievement of the local annual mean air quality target for Nitrogen Dioxide (NO₂), as set out in the city's Air Quality Action Plan (AQAP) and
- d) sets out appropriate site-specific mitigation measures to address negative impacts identified, following the principle of redesign – mitigate – offset.

Planning applications for proposals that involve significant demolition, construction or earthworks will also be required to submit a dust assessment as part of the AQA, to assess the potential impacts and health risks of dust emissions from those activities. Any appropriate site-specific dust mitigation measures will be secured as part of the Construction Traffic Management Plan (CTMP) as required by Policy C6.

All applications are expected to follow the guidance set out in the Oxford City Council's Air Quality Planning Application Guidance Note.

Land contamination

Due to Oxford's extensive history of development, there are areas of the city which are likely to be affected by poor soil quality and the presence of contaminants that could be harmful for human health. For example, the city has a number of closed landfill sites of varying ages, some of which are still actively producing landfill gas, as well as previously developed sites that have been contaminated by historic industrial processes. Contamination can also arise from natural sources.

Whilst the presence of contamination can restrict the use of land, development can also be an important mechanism in bringing land back into beneficial use through sustainable remediation processes that eliminate and/or control unacceptable risks in a safe and timely manner, and which maximise the overall environmental, social and economic benefits of the remediation work. The NPPF sets out that after remediation, as a minimum, land should not be capable of being determined as contaminated land under Part IIA of the Environmental Protection Act 1990.

In assessing whether land contamination is an issue that needs to be taken into account when a planning application is submitted, the Council will have regard to a range of information sources including its database of potentially contaminated sites, information provided by developers and third parties, and the advice from the Council's Environmental Health department. Ultimately, where a site is affected by contamination or land stability issues, responsibility for securing a safe development rests with the developer and/or landowner.

Policy R5 – Land contamination

Planning applications where proposals could be affected by contamination or where contamination may present a risk to the surrounding environment, must be accompanied by a report which:

- a) details the investigations that have been carried out to assess the nature and extent of contamination and the possible impacts it may have on the development and its future users, biodiversity, the natural and built environment; and**
- b) sets out detailed mitigation measures to allow the development to go ahead safely and without adverse effect, including, as appropriate:**
 - I. removing the contamination;**
 - II. treating the contamination;**
 - III. protecting and/or separating the development from the effects of the contamination;**
 - IV. validation of mitigation measures.**

Where site investigation and mitigation measures are needed, these will be required as a condition of any planning permission.

Soil Quality

Soils are a source of natural capital from which we derive many benefits including food production and flood mitigation, preserving water quality and acting as stores of organic carbon. The natural accumulation of soil can be a slow process and as such, soil should be considered to be a non-renewable resource which needs to be managed as such⁴.

⁴ https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/909069/ncc-advice-soil-management.pdf

On development sites in Oxford, particularly undeveloped areas of land and predominantly greenfield sites, it is important that proposals consider the type and quality of the existing soils and be designed in a way that incorporates measures to mitigate negative impacts from the development where appropriate, particularly to the highest quality soils. This could include tailoring construction processes to avoid loss, erosion, compacting soils with heavy machinery, as well as minimising risks from release of contaminants through the construction stages (see also policy R8 amenity). Applicants should make careful choices about the design of the site and its landscaping, such as by locating development away from the highest quality soils where relevant; ensuring beneficial soil reuse and sustainable soil management; as well as minimising artificial surface cover that would lock away the soils (in combination with high-quality green and blue infrastructure which will help meet requirements of policies G2 and G3). This will help to conserve and enhance soils as well as creating opportunities to allow regenerative practices to enhance soil quality in future.

Though the mapping of these habitats in the UK is limited, there is evidence of peat deposits (which are especially beneficial as carbon sinks) in several locations across Oxford as highlighted by Natural England⁵, particularly on greenfield sites. Where development comes forward in areas of known potential for peat deposits, any impacts on the natural and historic value of these reserves needs to be considered, including their important role as carbon sinks. Any harm or loss from a proposal which equates to removal or dewatering of 10m³ or more of peat will be refused.

To allow the Council to make an informed decision as to the impact of the development, proposals for major development of undeveloped land upon, or within 200m of, an identified peat reserve in the city (as per Natural England mapping) will need to submit an assessment that details soil conditions and any existing peat reserve affected by the scheme alongside the application. This assessment will need to be informed by physical borehole sampling to better understand the physical character of the underlying site and potential extent of any possible peat reserves. The submitted assessment should clearly set out the existing value of any identified reserves, addressing the key requirements in the policy.

Where there is potential for harm or loss of peat, proposals could seek to avoid impacts through careful design choices informed by the assessment, such as through development being located away from peat reserves where the site allows. Reliance on mitigation through offsetting the impact of lost peat alone, such as by providing carbon storage elsewhere, is unlikely to make a development acceptable as it is very difficult to achieve the same benefit for many years.

⁵ https://naturalengland-defra.opendata.arcgis.com/datasets/1e5a1cdb2ab64b1a94852fb982c42b52_0/explore?location=51.761809%2C-1.240866%2C13.00 (This mapping is expected to be updated by the England Peat Map project in future)

Policy R6 – Soil quality

Planning applications will be expected to demonstrate how the impact of development on soils has been mitigated and opportunities for conserving and enhancing the capacity/quality of soil maximised. The design and access statement and associated landscape plans should include details setting out the following where relevant:

- a. How impact on soils during the construction process has been minimised through avoiding: soil loss, compaction, pollution and reduction in the quality of soil; and
- b. Development has been located in a way that avoids highest quality soils on sites where possible; and
- c. Beneficial soil reuse and sustainable soil management has been implemented where possible; and
- d. Artificial surface cover that seals off soils has been minimised.

Planning permission will not be granted for proposals that would remove or dewater 10m³ or more of peat.

Major developments on undeveloped land upon, or within 200m of, known peat reserves should submit an assessment, informed by borehole sampling, to allow the Council to determine any potential impacts on reserves. The assessment should include details of the following:

- The estimated carbon footprint of the peat impacted by development.
- Its palaeo-archaeological interest.
- Its function in the surrounding habitats.
- Its hydrological condition and stability.

Amenity and Environmental Health Impacts of Development

New development can create environmental impacts, particularly during the construction phase, as well as once in operation. This can range from increased noise and vibration (e.g., from movement of trucks bringing materials to site, to presence of plant equipment on buildings once in operation), to the generation of dust and other contaminants (e.g., during demolition or processing of construction materials). These impacts need to be fully assessed during the planning application process to ensure that any potential nuisance resulting from the development can be properly mitigated to protect the amenity of residents, employees and the wider environment in the vicinity of the development.

The policy sets out a number of factors which should be considered where they could have an impact on amenity and health. As every development is different, the considerations set out will be of varying relevance – e.g., a taller building will have more potential to cause issues of loss of privacy for neighbours (refer to Policy HD 11) or microclimatic impacts like changes to wind drafts, meanwhile, a development in a quieter neighbourhood could cause more concerns about noise and traffic from construction than one located elsewhere. It is important that applicants consider the factors of relevance to their proposal and appropriately address these in their application to demonstrate that

they have addressed the amenity and environmental health impacts set out in this policy. For example, should the risk of glare be present from elements of the building, design could be modified by reorienting elements of the building to avoid reflection, or using matte cladding material.

Noise and vibration have a significant impact upon amenity and people's health and wellbeing. The management of noise should be an integral part of development proposals and should be considered at the earliest opportunity to ensure that the right acoustic environment is achieved in new development. The consideration of existing noise sensitivity within an area is important to minimise potential conflicts of uses or activities⁶. In cases where noise sensitive development is proposed near to an existing noise generating use (e.g., a music venue or pub) the Council will consider whether the introduction of the sensitive use might threaten the continued operation of the existing premises, which might mean the development is inappropriate in that location. Measures to mitigate the impacts of noise and vibration associated with demolition and construction will be secured by legal agreement or condition through construction management plans which form part of the transport assessment.

Applicants must ensure that any transport impacts likely to occur as result of the development are assessed and managed in compliance with Policy C6 Transport Assessments, Travel Plans and Service and Delivery Plans. Specific requirements related to amenity are also set out in separate policies in relation to matters of air quality (policy R4) and land quality including contamination (policy R5).

⁶ The Council typically require the cumulative noise level from all proposed building services plant to be 5 dB below the representative background noise level. Noise levels that are 10 dB or more above the existing background sound level, are likely to be an indication of a significant adverse impact. If the level is 5 dB above the existing background sound level, it is likely to be an indication of an adverse impact.

Policy R7 – Amenity and Environmental Health Impacts of Development

Planning permission will only be granted for development that:

- a. ensures that the amenity of communities, occupiers, neighbours and the natural environment is protected; and
- b. does not have unacceptable transport impacts affecting communities, occupiers, neighbours and the existing transport network; and
- c. provides mitigation measures where necessary.

The factors the City Council will consider in determining compliance with the above elements of this policy will also include where relevant:

- a) visual privacy, outlook;
- b) sunlight, daylight, overshadowing and mitigating glare from solar panels and windows where applicable;
- c) artificial lighting levels;
- d) transport impacts;
- e) impacts of the construction phase including the assessment of these impacts within the construction traffic management plans (refer to Policy C6);
- f) odour, fumes and dust;
- g) microclimate e.g., wind, overheating
- h) contaminated land;
- i) impact upon waste and wastewater infrastructure;
- j) noise and vibration; and
- k) preserving surrounding water quality.

Planning permission will not be granted for development sensitive to noise in locations which experience high levels of noise, unless it can be demonstrated through a noise assessment, that appropriate attenuation measures will be provided to ensure an acceptable level of amenity for end users and to prevent harm to the continued operation of existing uses.

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