Historic England

Climate Change and Historic Building Adaptation

Historic England Advice Note

Public Consultation Version

Summary

To a greater or lesser degree our historic buildings must continue to change and evolve if they are to contribute to a greener future and be fit for purpose for the people who live in, experience and care for them. If done thoughtfully and carefully these changes can achieve the complementary goals of protecting our heritage and adapting to a changing climate and low carbon economy. Historic England has produced this Advice Note to provide clarity and to support consistent decision-making.

The world faces huge challenges as a result of the climate emergency and the need to mitigate and adapt to unprecedented levels of environmental change. As an intrinsic part of the wider environment the historic environment is also under threat, but it can also be part of the solution. In the same way that nature-based solutions can address climate change, heritage-based solutions can also play a positive role.

Greenhouse gases emitted by human activities are the largest cause of global warming and climate change today, particularly the release of carbon dioxide. Buildings are one of the largest contributors of UK carbon emissions and can emit carbon dioxide throughout their whole lifecycle, including during construction and demolition. Maintaining, repairing, reusing, and adapting existing buildings to enable their continued use is, therefore, one of the most effective ways to reduce carbon emissions and unnecessary waste.

Buildings can and must adapt in response to climate change. It is not a question of 'if' but a question of 'how'. Adapting historic buildings appropriately does not just mean reducing carbon emissions and reliance on fossil fuels, it also means adapting buildings in ways that protect historic character, which contributes so much to making beautiful places, as well as supporting the economy and creating jobs.

Mitigating climate change and conserving historic buildings are compatible goals. Balancing and reconciling the two, however, can be challenging, particularly for local planning authorities (LPAs) when determining applications for planning permission and/or listed building consent.

Historic England has produced this Historic Environment Advice Note (HEAN) to provide clarity - to support consistent decision-making on what can be done and cannot be done to historic buildings to improve their energy efficiency and support carbon reduction, whilst conserving their significance. The HEAN also covers some typical building adaptations that can improve their resilience to the impacts of climate change. It sits within a suite of more detailed technical advice provided by Historic England.

Sections 1 and 2 outline the need for climate action and the general approaches that should be adopted when considering climate change adaptations to historic buildings, including the permissions that may be needed.

Within section 3 of this document - Climate action through building adaptations: common interventions – there is an outline of what changes can be made to historic buildings, and where caution is required. It is not an exhaustive list and instead focuses on the most common types of changes to historic buildings in response to climate change, which are primarily energy efficiency measures.

Section 4 considers how climate change and historic environment policies can be integrated in local plans.

This HEAN is aimed primarily at LPAs, heritage consultants and other parties directly involved in the planning process. Whilst largely a specialist audience, it is hoped that it might also be of use to applicants and building owners and occupiers. Whilst its contents may be instructive, it is not intended to cover buildings in ecclesiastical use, changes to which are managed by the parallel system of ecclesiastical exemption.

This HEAN provides:

- Advice on the need for planning permissions or other consents for some of the common changes required to decarbonise and improve the energy efficiency of historic buildings.
- Advice to assist LPAs – and other parties involved in the planning process – in determining proposals to decarbonise and improve the energy efficiency of historic buildings to enable positive climate action. Some typical building adaptations that can improve their resilience to the impacts of climate change are also included.
- Advice on how local plans and other planning mechanisms can deliver a positive strategy for historic buildings that proactively supports climate action.
- Signposting to other relevant information, advice and guidance and will be accompanied by online case studies available on our website.

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HistoricEngland.org.uk/advice/planning/planning-system

Contents

1 The need for climate action

A heritage solution: adapting historic buildings

1. Under the Climate Change Act 2008, the UK government is committed to reducing greenhouse gas emissions by 100% compared to 1990 levels by 2050 - this target is known as Net Zero. Buildings are the UK's second highest carbon-emitting sector, accounting for 17% of total emissions[1], and they can emit carbon over their whole lives. Buildings are also at risk from the effects of climate change and may need to adapt to ensure their resilience to current and future impacts.

2. Embodied carbon emissions are generated during construction, repair, maintenance, alteration or demolition of buildings, including carbon emitted through the extraction, processing and transportation of materials. The greenest building is the one that already exists and keeping them in active use is one of the most beneficial things we can do to lower our carbon emissions. Furthermore, many historic buildings are inherently sustainable because they were constructed from – and can be maintained and repaired using - local, low-carbon materials.

3. Operational carbon emissions are derived from the generation, supply and use of electricity, gas and other fuels used in a building for heating, cooling, ventilation, lighting, hot water, appliances and other equipment. Improving the energy efficiency of buildings and maximising opportunities for on-site renewable energy generation, can lower carbon emissions and fuel bills, and can improve thermal comfort.

4. Whole-life carbon is the sum of embodied and operational carbon emissions resulting from the construction and use of a building over its life (including its demolition).

5. The process of improving the energy performance of existing buildings through technical interventions is commonly referred to as retrofit. Responsible retrofit should deliver sustained net reductions in energy use and carbon dioxide emissions, at minimal environmental impact, while maintaining the quality of the existing built environment and improving human health. Heritage conservation and climate action can and should be mutually reinforcing.

1 2023 Progress Report to Parliament - Climate Change Committee (theccc.org.uk)

6. For more information on how adapting historic buildings can reduce carbon emissions and fight climate change see:

- Heritage Counts, 2020. Know Your Home, Know Your Carbon: Reducing Carbon Emissions in Traditional Homes.
- Heritage Counts. 2019. There's No Place Like Old Homes: Re-Use and Recycle to Reduce Carbon.

It is important to note that energy efficiency is not the same as carbon reduction. It is possible to improve the energy efficiency of a building while also increasing its carbon footprint if energy efficiency measures are not carefully designed with the building context, location, design, construction and use in mind. While the operational emissions may be reduced, the overall embodied carbon can increase when emissions associated with the sourcing, manufacture and transportation of materials are considered. Further emissions can be generated if inappropriate measures need to be removed or replaced later because they do not perform effectively.

2 Climate action through building adaptations: approaches and permissions

7. Historic buildings, both listed and unlisted buildings in conservation areas, are likely to be of traditional construction. For example, they may incorporate solid walls and permeable construction materials. These require a different approach to buildings of modern construction, which typically have cavity walls and are vapour impermeable.

8. This section outlines some of the factors to consider when dealing with buildings of traditional construction, including any additional controls that may be in place for listed buildings and unlisted buildings in conservation areas.

Listed buildings and conservation areas

The Planning (Listed Buildings and Conservation Areas) Act 1990 allows for the designation and protection of listed buildings and conservation areas. There are other categories of designated heritage assets, such as world heritage sites, scheduled monuments, registered parks and gardens and registered battlefields. Listing or designation as part of a conservation are the most commonly used tools for protecting historic buildings.

All listed buildings are nationally important and are classified into three grades:

- Grade I for buildings of exceptional significance and the highest importance.
- Grade II* for buildings of more than special significance.
- Grade II for buildings of special significance.

Most listed building owners are likely to live in a Grade II building as these make up 92% of all listed buildings.

There are around 400,000 entries on the National Heritage List for England, accounting for around 2% of the building stock in England. The 8% of buildings listed at Grade I and II* therefore represent a very small proportion of England's building stock.

Listing of a building protects not only the building, both inside and out, but also pre-1948 ancillary structures within its curtilage, and ancillary objects or structures fixed to the building. Protection applies to all fixtures, fittings and ancillary structures unless expressly excluded in the listing. Curtilage is a complex area and more information on it is available in Historic England Advice Note 10: Listed Buildings and Curtilage.

A conservation area is an area of special architectural or historic interest, the character or appearance of which it is desirable to preserve or enhance. The character or appearance of a conservation area is derived from a variety of factors including the buildings and spaces within it.

There are around 2.8 million homes in conservation areas in England.

Preliminary considerations

9. When considering any works to a historic building there are three main considerations:

- Would the works be effective and compatible with the way the building performs?
- Would they harm the significance of the building or conservation area?
- What planning permission(s) or consents would be required?

10. Both technical considerations and significance vary greatly from building to building - there is no one-size fits all approach. Some works in response to climate change would be so harmful to a building's heritage significance that they would not be approved, but in other cases some impact on significance might be balanced against real climate change benefits.

11. Whilst every building – and the solutions to making energy and carbon savings – may be different, there are some principles that apply across the board and Historic England advocates, where appropriate, adopting

a ‘whole-building approach’ that uses an understanding of a building in its context to find balanced solutions that save energy, sustain heritage significance, and maintain a comfortable and healthy indoor environment.

12. Taking a whole-building approach does not necessarily mean prioritising interventions that will achieve the greatest energy and carbon savings. In many cases, incremental and specific changes should be made (for example replacing failing windows) as and when the opportunities arise.

13. The maintenance and repair of older buildings is essential to their long-term conservation and energy performance, and should be undertaken before adaptions are considered. Small-scale interventions should be considered before more substantial ones and should be reversible where possible. Historic England’s Energy Efficiency and Historic Buildings How to Improve Energy Efficiency includes more information on the whole-building approach and a helpful checklist on the order of priority in which different interventions should be considered.

14. It is also important that works are undertaken by experienced contractors, who understand how historic buildings perform technically. For more complex interventions it will be necessary to get advice from appropriately qualified and experienced professionals. Details on finding the right help can be found on our website.

Would the works be effective and compatible with the way the building performs?

15. Successful retrofit takes into account the construction and heritage significance of the existing building. Certain retrofit strategies, specifically those for modern construction, are not appropriate for historic buildings. Some works to improve energy efficiency (particularly internal and external wall and underfloor insulation) can cause dampness within a building’s structure, if not properly specified. We strongly recommend that you take specialist advice to guard against maladaptation when considering such interventions.

16. Technical characteristics of each building's performance differ due to a building’s location, orientation, design, construction, engineering services, and the way it is used, managed and maintained. All these factors influence energy use and the effectiveness of energy efficiency measures.

17. We strongly advise that Historic England’s Your Home and technical guidance webpages are read at the outset of the project.

18. Energy Performance Certificates (EPCs) provide information on a property's energy use, typical energy costs, and recommendations about how to reduce energy use and save money. Caution should be exercised when using EPC's to inform design or retrofit activities as modelling can be misleading and may provide inappropriate recommendations which could harm the character or risk deterioration of such buildings. More information on EPCs and traditional buildings is available here.

Would the works be consistent with the significance of the building?

What is significance?

19. The concept of significance is central to the historic environment chapter of the National Planning Policy Framework (NPPF). The NPPF defines significance as 'the value of a heritage asset to this and future generations because of its heritage interest.' This interest may be archaeological, architectural, artistic or historic and it may derive 'not only from a heritage asset's physical presence, but also from its setting.'

What is significance – an example

A 17th century house in Warwick, rebuilt after a fire in 1694 would derive its significance from its:

- architectural and artistic interest, as an example of a late 17th century classical house, altered in the later 18th century;
- historic interest, as the expression of the social and economic life of a prosperous town of the period, and, specifically, as the product of the rebuilding of Warwick after the devastating fire of 1694.

20. For listed buildings and conservation areas, 'significance' is another way of understanding what the Planning (Listed Buildings and Conservation Areas) Act 1990 describes as architectural or historic interest. In decision-making, the 1990 Act requires that 'special regard' is given to preserving the architectural or historic interest (that is the significance) of listed buildings and their settings. 'Special attention' needs to be paid to the preservation or enhancement of the 'character or appearance' (that is significance) of conservation areas.

21. Where permissions are required, it is important that the application describes the significance of the heritage asset affected. For LPAs it is important that they articulate how they have had special regard to preserving the architectural or historic interest of the listed building (or paid special attention to the character or appearance of the conservation area) when coming to a decision.

Understanding significance

22. To understand the significance of a building or other heritage asset, it is necessary to consider why it is valued. Historic England's Conservation Principles, Policies and Guidance identifies 'heritage interests' as a mechanism for understanding and articulating significance. Historic buildings and areas embody some, or all, of these interests, to varying degrees.

23. Buildings may embody archaeological interest within their fabric – evidence of successive changes in form, function and material and of the social and economic circumstances which these reflect – as well as in the ground beneath them.

24. Architectural and artistic interest is immensely varied. It is to be found in the architectural design of the grandest buildings, such as St. Paul's Cathedral, in that of modest vernacular houses and cottages, the product of local and regional building traditions, and in the design of agricultural and industrial buildings. All structures may have architectural interest. Artistic interest is most obviously to be found in things such as richly modelled plasterwork or painted interiors, but the craftsmanship of many buildings will be of architectural or artistic interest.

25. Buildings' historic interest reflects their capacity to illustrate or evoke our past and embody shared meanings. Again, it is immensely varied. Buildings such as the Palace of Westminster or Manchester Town Hall illustrate our national story, but villages, market towns, industrial mills and structures of all sorts will illustrate equally meaningful stories.

26. The National Heritage List for England can be helpful in finding out more about a building. It does not always contain an exhaustive description and some listing records are more detailed than others, however it may give an indication of some aspects of a building's significance.

27. For conservation areas, LPAs should have prepared a Conservation Area Appraisal, which outlines the history of an area and explains its significance. It should also provide some general guidelines on managing change and carrying out development in the conservation area.

28. It is important to note that an understanding of heritage significance must include an analysis of the contribution that setting – which is the surroundings in which an asset is experienced – makes to that significance. Whilst setting is often concerned with views and other visual

considerations, other factors can also be important. Historic England's The Setting of Heritage Assets: Historic Environment Good Practice Advice in Planning: 3 contains further information on how to understand and assess how setting contributes to the significance of heritage assets.

Making sure proposals are consistent with significance

29. Proposals that affect historic buildings (and the historic environment more generally) are much more likely to gain the necessary permissions if they are designed with the knowledge and understanding of the significance of the heritage assets they may affect.

30. As a rule, it is important that any proposals aim to first avoid, and then to minimise, harm to the significance of a heritage asset – in this case the historic building or conservation area.

31. When applications for changes to a building in response to climate change are assessed, a balance will have to be made between the significance of the heritage asset and the public benefits (that is positive climate action) provided by the proposal. Conservation of the heritage asset should always be given great weight and the more important the heritage asset, the greater that weight should be (NPPF, paragraph 199).

32. Proposals to undertake changes to a historic building in response to climate change are likely to be acceptable where:

- They are based on a full understanding of the significance of the heritage asset;
- They have been designed to avoid and then minimise impact on heritage significance as far as is practicable;
- The benefits could not reasonably be achieved in a way that is less harmful to the significance of the asset; and
- They do not cause unjustified harm to the significance of the heritage asset.

33. More information on how significance should be managed through the planning system is available in Historic England's Managing Significance in Decision-Taking in the Historic Environment Historic Environment Good Practice Advice in Planning: 2.

34. Section 3 of this Advice Note offers advice to general advice on the likely impact on significance of different interventions and gives advice on how this approach can be applied to decision-making.

Assessing significance

35. Both planning applications and applications for listed building consent need to describe the significance (including setting) of any heritage assets affected by the proposals and explain how that significance might be changed – for worse or better.

36. These assessments should be proportionate to the affected assets' importance and no more than is needed to understand the potential impact of the proposal on their significance.

37. When making major changes to historic buildings and places, this should be accompanied by a Statement of Heritage Significance, setting out the importance of the building affected by the proposal. An archaeological desk-based assessment may also be needed if disturbance of buried archaeology is anticipated.

38. Statements of Heritage Significance and archaeological desk-based assessments should be prepared by appropriately qualified specialists.

39. More information on assessing significance is available in Historic England's Statements of Heritage Significance: Analysing Significance in Heritage Assets and in the Chartered Institute for Archaeologists Standard and guidance for historic environment desk-based assessment.

What planning permission or consents would be needed?

40. The need for planning permission or other consents does not automatically mean that change is not allowed, they are a mechanism for assessing proposals and managing change effectively.

Planning permission

41. Planning permission is needed for works that constitute development. This includes building works, some kinds of demolition and changes of use to existing buildings. It does not include internal alterations to buildings and works that do not materially affect the external appearance of a building and, accordingly, such works do not need planning permission although other consents may be required (for example, listed building consent).

42. Further advice is provided in the Planning Practice Guidance and on the Planning Portal and further clarification can be sought from the planning or conservation officers at the relevant LPA.

Permitted development

43. Certain works can be done without applying for planning permission as they do not constitute development. Other works which constitute development may have been granted permission through 'Permitted Development Rights' and are set out in the Town and Country Planning (General Permitted Development) (England) Order 2015 (as amended) (GPDO).

44. Permitted development rights are a national grant of planning permission which allow certain works to take place without having to submit a planning application. Permitted development rights allow for a wide variety of works in conservation areas (albeit with limitations). There may also be additional restrictions on certain permitted development rights for example in article 2(3) land, this includes national parks, World Heritage Sites, areas of outstanding natural beauty, and conservation areas.

45. Some permitted development rights exclude listed buildings but, regardless of whether planning permission is granted by a permitted development right, listed building consent will be required for work to a listed building.

46. A proposal must meet all relevant limitations and conditions (set out in the GPDO) in order to qualify as permitted development. One such condition on certain classes of permitted development is the need to submit an application to the LPA to determine if 'Prior Approval' is required. Prior approval means that a developer has to seek approval from the LPA that specified elements of the development are acceptable before work can proceed. The matters for prior approval vary depending on the type of development and these are set out in full in the relevant parts in the GPDO. An LPA cannot consider any other matters when determining a prior approval application.

47. The GPDO has been amended on a regular basis and, whilst every effort will be made to keep this Advice Note up to date, you are strongly advised to check whether there have been any subsequent amendments to permitted development rights. Additional government advice is available on the permitted development rights that apply to homeowners.

Article 4 Directions

48. In some circumstances, permitted development rights can be removed by an LPA by using an Article 4 Direction. These are put in place when there are elements of a building or place that it wants to protect and they restrict the scope of permitted development rights either in relation to a particular area or site, or a particular type of development anywhere in the authority's area. Where an Article 4 Direction is in effect, a planning

application may be required for development that would otherwise have been permitted development. Information on Article 4 Directions in place should be available from the LPA's website.

Heritage consents

Listed Building Consent

49. Listed building consent is required for all works – alterations, extensions, or demolition – that affect the significance/special interest of a listed building under the Planning (Listed Buildings and Conservation Areas) Act 1990, irrespective of the need for planning permission. It is important that it is obtained when required, as carrying out unauthorised works to a listed building is a criminal offence.

50. An application for listed building consent is made to, and determined by, the LPA. Where the works have an impact on the external appearance of the building, planning permission may also be required and if so should be applied for at the same time.

51. Where there is uncertainty as to whether permissions are required we recommend contacting the LPA in the first instance. Strict certainty as to whether proposed works for the alteration or extension of a listed building would not affect the special interest of the listed building – that is, be lawful – can be sought from the LPA by applying for a Certificate of Lawfulness of Proposed Works (CLPW), describing the works proposed to the building. If the LPA is satisfied that the works would not affect its significance, it must then issue a Certificate to that effect. There is no charge for an application for listed building consent or a CLPW.

52. Historic England's Advice Note 16: Listed Building Consent gives further advice on the operation of this consent regime.

Scheduled Monument Consent

53. In some instances a building or structure may be scheduled in addition to, or instead of, being listed. Scheduled monuments are nationally important monuments that are added to the 'Schedule' (the list of legally-protected monuments) by the Secretary of State for Culture, Media and Sport, under powers contained in the Ancient Monuments and Archaeological Areas Act 1979.

54. Scheduled Monument Consent must be obtained from the Secretary of State for Culture, Media and Sport before any works to a scheduled monument. Where a scheduled monument is both listed and scheduled, the scheduled monument statutory regime takes priority over the need for listed building consent.

3 Climate action through building adaptations: common interventions

Introduction

55. Decision makers need to strike a balance between maximising the benefits from mitigation and adaptation to climate change and minimising harm to the historic environment. Judging where the balance lies is pivotal.

56. This section sets out the approach to decision-making, highlights the key considerations needed to judge the planning balance for climate change and the historic environment, and seeks to provide clarity as to what is and is not acceptable in particular scenarios. It forms the basis for Historic England advice and should inform LPA decision-making.

Approach

57. When deciding planning or heritage consent applications LPAs should assess the proposal and supporting information in the application against the following legislation and policy.

58. **Legislation:** The Climate Change Act 2008 requires that the UK reaches Net Zero by 2050. The Levelling Up and Regeneration Act 2023 requires the Secretary of State to have special regard to the mitigation of, and adaptation to, climate change with respect to national policy, local plan-making and planning decisions; making reference to the Climate Change Act 2008.

59. The Planning (Listed Buildings and Conservation Areas) Act 1990 requires that in decision-making 'special regard' is had to the desirability of preserving the architectural or historic interest of listed buildings and their settings and 'special attention' paid to desirability of preserving or enhancing the character or appearance of conservation areas. In those rare cases where historic buildings are also scheduled monuments the Ancient Monuments and Archaeological Areas Act 1979 applies.

60. **Policy:** The NPPF aims to deliver sustainable development through three interdependent objectives, which are to be pursued in mutually supportive ways. The three objectives comprise: an economic objective; a social objective; and an environmental objective (paragraph 8). There are climate change and heritage references throughout the NPPF, as well as specific chapters on both topics:

- Chapter 14 - Meeting the challenge of climate change, flooding and coastal change
- Chapter 16 - Conserving and enhancing the historic environment

61. Together the chapters emphasise the importance of shaping places in ways that respond to their existing environments, be they historic and/or natural. Decisions need to balance the inevitable need for change with the impact that change has on that environment. Whilst those principles align, it is decision-making at the level of planning and listed building consent applications where impacts need to be balanced, and it is that process of balancing that is covered in this section.

Decision-making

62. Where proposals to improve the energy efficiency of historic buildings require planning and/or listed building consent applications, their determination by the LPA will be guided by planning legislation and the NPPF. The need for permissions for different types of interventions is covered in more detail in paragraphs 73-108.

63. To understand the potential impact from climate change actions on the significance of historic buildings and areas the following steps and questions are advised. This approach is necessary to meet the requirements of the NPPF paragraph 199 and ensure 'great weight' is given to the asset's conservation, noting that the more important the asset the greater the weight should be.[2]

64. Understand the significance of the affected assets.

- Has the significance of the historic building(s) and area been properly identified, understood and articulated?

2 This is informed by the approach in the chapter 16 of the NPPF, accompanying Planning Practice Guidance and Historic England's Good Practice Advice Note 2: Managing Significance in Decision-Taking in the Historic Environment.

65. Understand the impact of the proposal on that significance.

- Has the effect on significance of the historic building(s) and areas, including any contribution made by setting, been properly identified, understood and articulated?[3]

- What level of harm is the proposal likely to have on the significance (including any contribution made by setting) of the building(s) or conservation area?

66. Avoid, minimise and mitigate impact in a way that meets the objectives of the NPPF.

- Has the proposal been designed and/or modified to avoid, minimise and then mitigate harm to the significance of the historic building(s) and area?

- Are the proposed works reversible?

67. Look for opportunities to better reveal or enhance significance.

- Have opportunities to better reveal or enhance the significance of the historic building(s) or conservation area, or the appreciation of that significance been taken?

68. Justify any harmful impacts in terms of balancing the sustainable development objectives of conserving significance and the need for change.

- Does the proposal justify any remaining harm to the significance of the historic building(s) or conservation area in a clear and convincing way?

69. Understand the public benefits.

- Does the proposal offer public benefits as defined in the Planning Practice Guidance (Paragraph 020 Ref ID: 18a-020-20190723) and are these understood and articulated?[4]

3 The advice later in section 3 of this Note provides some help in considering the impacts and benefits of commonly proposed works.

4 The Planning Practice Guidance states that 'Public benefits may follow from many developments and could be anything that delivers economic, social or environmental objectives as described in the NPPF paragraph 8'.

Advice

70. The advice in this section outlines what changes can be made to historic buildings and where caution is required. It is not an exhaustive list and instead focuses on the most common types of changes to historic buildings in response to climate change, which are primarily energy efficiency measures but also includes measures in the setting of historic buildings in response to climate change.

71. Clear advice on how to strike the balance described above cannot remove the complexity of this subject. Some works which would help mitigate or adapt to climate change would be so harmful to special interest or character that they should not be approved. Other works, which might be acceptable if effective, could, in particular cases, prove counter-productive by reducing performance, impacting efficiency, damaging building fabric or harming the health of occupants.

72. Whilst the emphasis is on changes that might be made to domestic properties, matters raised in this section will be of relevance to other historic buildings of traditional construction. By its very nature this is general advice and cannot cover every eventuality.

Works to unlisted buildings in conservation areas

Internal works

73. As a general rule, internal works to unlisted buildings in conservation areas do not require planning permission: although building regulation approval may be required for more substantial internal works.

74. There are, therefore, a wide range of options for improving the energy efficiency of an unlisted building in a conservation area which do not require planning permission, such as:

- Internal insulation: including loft/roof and underfloor insulation.
- Changing boilers and heating systems to a more efficient installation, including switching to a cleaner fuel source.
- Draught-proofing doors and windows.
- Secondary glazing of windows.

Some works to improve energy efficiency (particularly internal and external wall and underfloor insulation) can cause dampness within a building's structure, if not properly specified. We strongly recommend that specialist advice is taken to guard against maladaptation when considering such interventions.

External works

75. As with buildings outside conservation areas, there is a wide range of external works that can be undertaken under permitted development rights, unless an article 4 direction is in place (see paragraph 48). Permitted development rights are subject to limitations and conditions. There can be additional limitations in conservation areas, and these vary slightly whether the building is in domestic or non-domestic use, but broadly speaking limitations specific to conservation areas include:

- Replacement of windows and double glazing: works to a dwelling house are permitted if the materials used are of a similar appearance to those used in the construction of the existing dwelling house.[5] Installing double glazed units within existing windows, if there is no other material alteration to the windows themselves is unlikely to require planning permission in dwelling houses. Due to their visual character and operational differences PVCu (unplasticised polyvinyl chloride) replacement windows are generally unsuitable for older buildings. They generally have a relative short service life and the whole life cycle carbon emissions of a PVCu replacement window will be higher than an appropriately upgraded traditional window.
- Photovoltaic and solar thermal panels: are permitted on roof-slopes of a dwelling house or buildings within the curtilage of a dwelling house. The permitted development right does not apply where solar panels would be installed on the wall of a dwelling house which fronts a highway. Stand-alone solar in the curtilage of a dwelling house or non-domestic building is not permitted if the stand-alone solar is installed closer to the highway than the dwelling house or non-domestic building. A planning application is required to install solar panels on the roof-slope or wall of a non-domestic building facing a highway.[6]
- Microgeneration: ground and water source heat pumps are permitted development.[7]
- Microgeneration: air source heat pumps are permitted development for a dwelling house or block of flats unless they are on a wall or roof fronting a highway or forward of the building line fronting a highway.[8]
- Microgeneration: wind turbines are not permitted development for a dwelling house or block of flats if they are on a wall or roof fronting a highway or forward of the building line fronting a highway, for standalone turbines.[9]

5 Schedule 2, Part 1, Class A of the GPDO

6 Schedule 2, Part 14, Class A of the GPDO

7 Schedule 2, Part 14, Class C and D of the GPDO

8 Schedule 2, Part 14, Class G of the GPDO

9 Schedule 2, Part 14, Class I of the GPDO

- External wall insulation: in most cases, unless the building is already rendered, is likely to be a material change to the building's appearance and therefore require an application for planning permission.[10]
- Domestic off-street electric vehicle charging points: points attached to the building or an upstand are permitted development.[11]
- Adaptations to improve the resilience to the effects of climate change, such as awnings and blinds (to reduce overheating) and changes to rainwater goods (to accommodate increased rainfall): internal blinds and shutters are unlikely to need planning permission. External alterations, which impact on the appearance of a building, are likely to need planning permission, although it may be possible to make changes to rainwater goods without impacting on the appearance of a building. There may be historical precedents in the surrounding (conservation) area for external awnings, blinds or shutters.

Works to listed buildings

76. This section outlines what Historic England considers likely to be, and not to be, acceptable in most instances. It cannot cover every eventuality and decisions must be made on a case-by-case basis. However, in the majority of cases we believe it is possible to improve energy efficiency without harm to the significance of listed buildings.

77. It is aimed primarily at buildings in residential use and is not intended to cover buildings in ecclesiastical use, changes to which are managed by the parallel system of ecclesiastical exemption.

78. Both internal and external works require listed building consent where they impact on the special architectural or historic interest of the building. However, some works may not impact on a building's special interest and can be undertaken without the need for listed building consent. Historic England's Advice Note 16: Listed Building Consent gives further details on what works are unlikely to need consent.

79. Listed buildings of the highest significance are recognised through being designated at Grade I or II*, and buildings of higher significance are likely to be more sensitive to change so different approaches may be needed. Similarly, there may be Grade II buildings of greater significance, or areas within those buildings of greater significance, which may be more sensitive to change and adaptation.

10 Schedule 2, Part 1, Class A of the GPDO

11 Schedule 2, Part 2, Class D and Class E of the GPDO

Windows

80. Draught-proofing windows will almost invariably be acceptable.

- Draught-proofing – one of the simplest and most cost-effective means of improving a building's thermal performance – can usually be achieved with only a negligible effect on a building's special interest.
- Well maintained windows will be less draughty than windows in poor repair. Before draught-proofing windows it is always advisable to make sure they are in a good state of repair.
- Whilst draught-proofing works can entail the cutting of grooves in historic joinery to accommodate draught strips this can generally be done in a way which doesn't harm the building's special interest.
- Exceptions are rare, but may include windows of exceptional delicacy, or windows which cannot be unobtrusively draught-proofed.
- Listed building consent would be required only if the physical works would impact on the special interest of the listed building.

81. The replacement of windows which do not contribute to the architectural or historic interest of a building with double-glazed windows of sympathetic pattern, will generally be acceptable.

- Many historic buildings have windows which are either relatively recent, contribute to a building's special interest through their pattern and detailing alone, or detract from it due to their inappropriate design.
- In such cases, their replacement with double-glazed windows of an appropriate glazing bar pattern and detailing is likely either to be largely neutral in its effect on the building's special interest or may improve it.
- This will not be so in the case of original or earlier windows which contribute positively to a building's special interest through both historic fabric and design.
- More broadly, original and other historic windows which contribute to the special interest of a building should not be replaced (though their panes could be, see relevant section below).
- The replacement of windows will require listed building consent.

82. The installation of secondary glazing to the windows of listed buildings will generally be acceptable.

- Secondary glazing will provide significant improvements to thermal performance and energy conservation, and in respect of multi-pane windows may outperform double-glazing.
- In most cases, the installation of secondary glazing may cause modest harm to a building's special interest, as it will have a slight impact on historic fabric and a more pronounced one on historic or architectural interest; generally, such harm will be acceptable in view of the benefits obtained.
- Exceptions, in which such installations would be unlikely to be acceptable, may include buildings of monumental character (for example, of exceptional architectural quality such as the finest state rooms of a great house), buildings with historic shutters which would be damaged or rendered inoperative by the installation, and buildings with glazing of exceptional significance, which should not be obscured.
- Listed building consent would be required only if a proposed installation would affect its special interest as a listed building.

83. The installation of slim-profile double glazing within historic frames will generally be acceptable.

- The use of slim-profile double-glazing allows the installation of double-glazing in historic buildings while preserving the majority of the contribution made by their historic windows to their special interest.
- Many historic window frames – including their integral glazing bars – will be capable of accommodating such glazing.
- Exceptions, in which such installations are unlikely to be acceptable, will include historic windows which retain historic glass of interest, windows of historic or architectural interest whose frames or glazing bars cannot support slim-profile double-glazing, and windows with leaded lights.
- The installation of slim-profile double-glazing will require listed building consent, unless they are replacing panes in modern windows.

84. For further information see:

- Modifying Historic Windows as Part of Retrofitting Energy-Saving Measures.
- Historic England, 2016. Energy Efficiency and Historic Buildings: Draught-proofing windows and doors.
- Historic England, 2016. Energy Efficiency and Historic Buildings: Secondary glazing for windows.
- Historic England, 2017. Traditional Windows Their Care, Repair and Upgrading.

Doors

85. **Draught-proofing doors will generally be acceptable.**

- The same considerations apply as for windows – for which, see above.

Insulation

86. If not specified correctly, the installation of insulation (particularly internal and external wall and underfloor insulation) has the potential to cause condensation. This can cause dampness within a building's structure, and can be harmful to both the building and occupants alike. We strongly recommend that you take specialist advice to guard against maladaptation when considering such interventions.

87. **Loft insulation will generally be acceptable.**

- Loft insulation is fundamental to the improvement of a building's thermal performance.
- Unless unsuitable for technical reasons, a method of insulation which does not require the alteration of the form of a historic roof or the loss of historic finishes (for example, plaster ceilings) should be chosen.
- Proposals which do require such alteration or loss will have to be assessed on a case-by-case basis.
- Spraying insulation within lofts is likely to result in harm to the fabric of a building, can often not be removed and so should be avoided.
- Listed building consent should not be required for the simple introduction of removable insulating material but will be required for works which entail alterations to a building.

88. **Insulation between, or under, floors will generally be acceptable.**

- Insulation within the floor void, will generally be acceptable provided it can be accommodated without changing floor levels and without undue disruption/harm to any historic floor surfaces. The same applies to ceilings if insulation were to be introduced from below.
- Underfloor insulation (for example where a timber ground floor is suspended over bare earth) may be acceptable unless the underfloor layer or finishes are particularly significant and is directly impacted upon by the installation of the insulation.
- Insulating under solid floors could be problematic and may not be appropriate.
- Listed building consent may be required in some circumstances or a Certificate of Lawfulness of Proposed Works should be sought from the relevant LPA.

89. **Internal wall insulation will be acceptable only in some cases.**

- The special interest of most listed buildings owes much to the character of their interiors – the spaces and their finishes, including historic plaster, joinery, cornices, chimneypieces and other fittings.
- The introduction of internal wall insulation will generally disrupt these, to harmful effect.
- Internal wall insulation may be acceptable in buildings whose historic interiors have been lost or largely compromised and in some buildings whose interiors may not be sensitive to such changes.
- If it is appropriate to line previously unlined internal walls as part of a conversion, then the opportunity to introduce insulation will exist.
- Listed building consent will almost always be required for the installation of internal wall insulation.

90. **External wall insulation is unlikely to be acceptable.**

- The external appearance of listed buildings is an important component of their special interest –due both to the historic materials of their walling, but also to the relationship between eaves, windows, doors, other architectural detail and wall surfaces.
- The addition of external insulation will generally disrupt these, to harmful effect.
- Exceptions may include buildings whose exteriors have been severely compromised (for example, by the addition of inappropriate renders or unsympathetic general alterations) and some modernist buildings, finished in modern renders, providing that the work does not disrupt the relationship between wall surfaces and details.
- Listed building consent will always be required for the installation of external wall insulation.

91. The installation of insulation within external walls may be acceptable in certain circumstances.

- Two types of listed building may be capable of accommodating insulation between their outer protective surface and their inner wall surfaces: those which are framed, and those clad with finishes such as weatherboarding.
- Historic timber-framed buildings have infill panels of various materials. In situations where, as is often the case, the historic infill materials have been replaced, it may be appropriate to renew the infill while also taking into account opportunities for enhancing the thermal performance of the building envelope.
- Similarly, it may be possible to accommodate insulation between the outer cladding and the internal plaster of weather-boarded houses, or other historic buildings with forms of external cladding.
- Should the attempt to do this entail thickening the walls, consideration will need to be given to the relationship between wall surfaces and historic details, and a case-by-case assessment of appropriateness will be required.
- All the works described in this section would require listed building consent.

92. The reinstatement of render finishes removed from listed buildings that were historically protected by render will improve their thermal performance and is almost invariably desirable.

- Buildings constructed of rubble stone were generally intended to be rendered, for practical and aesthetic reasons; and so, too, were many timber-framed buildings.
- In the 20th century particularly, historic render was often removed from rubble and timber-framed buildings, due to a misunderstanding of their historic character, or a wish to display their materials.
- The reinstatement of missing renders (using lime products, or natural cement binders, as appropriate) will improve the thermal performance of such buildings, both by thickening their walls and by protecting them from damp, while also restoring lost historic and architectural significance: it is likely to be desirable on both counts.
- It may be possible to introduce insulation beneath the new render: should the attempt to do this entail thickening the walls, consideration will need to be given to the relationship between wall surfaces and historic details, and a case-by-case assessment of acceptability will be required.
- Listed building consent would be required for such works.

93. For further information see:

- Historic England, 2016. Energy Efficiency and Historic Buildings: Insulating pitched roofs at ceiling level-cold roofs.
- Historic England, 2016. Energy Efficiency and Historic Buildings: Insulating thatched roofs.
- Historic England, 2016. Energy Efficiency and Historic Buildings: Insulating flat roofs.
- Historic England, 2015. Energy Efficiency and Historic Buildings: Insulating pitched roofs at rafter level.
- Historic England, 2015. Energy Efficiency and Historic Buildings: Insulating timber-framed walls.
- Historic England, 2016. Energy Efficiency and Historic Buildings: Insulating solid walls.
- Historic England, 2016. Energy Efficiency and Historic Buildings: Early cavity walls.
- Historic England, 2016. Energy Efficiency and Historic Buildings: Insulating solid ground floors.
- Historic England, 2016. Energy Efficiency and Historic Buildings: Insulation of suspended timber floors.

Heating Systems

94. **Changing boilers, heating and hot water systems to low carbon alternatives will generally be acceptable.**

- Exceptions may be where the heating system, or components of it, have architectural or historic significance (for example, original cast-iron radiators) that remain functional.
- Listed building consent will generally not be required, such as for replacing a modern boiler with a more efficient version. Listed building consent may be required in some circumstances (for example where there are changes to flues) or a Certificate of Lawfulness of Proposed Works can be sought from the relevant LPA.

95. For further information see:

- Heating Historic Buildings

Photovoltaic and solar thermal panels

96. The installation of photovoltaic and solar thermal panels is likely to be acceptable on listed buildings in particular circumstances.

- Installation of photovoltaic and solar panels can often be designed in such a way to avoid harming the special interest of most listed buildings. They have the potential to be visually incongruous so care is required when considering their impact on the architectural qualities of the listed building, as well as their impacts in short and long views of the building.
- In a minority of cases, the physical work required to install them may cause unacceptable harm.
- Listed building consent will always be required for the installation of photovoltaic and solar thermal panels.

97. The installation of panels will generally be acceptable on non-principal roofs – such as valley roofs, and flat and low-pitched roofs which are concealed.

98. The installation of panels will generally not be acceptable on principal roof slopes, if they would be visible and would detract from the building's special interest.

- As the front elevations of buildings are generally the most important and the most prominent, they will usually be the most sensitive place to site photovoltaic and solar thermal panels.
- In some cases, other elevations and their associated roof slopes will be equally, or more, sensitive.
- Exceptions may include buildings whose significance may be less sensitive to the installation of such panels (for example, certain industrial buildings).

99. The installation of panels on roof slopes of less prominence is likely to be acceptable, even if they would be visible.

- Roof slopes of less prominence will generally provide the more acceptable place to install panels, as their impacts will be limited.
- Roof slopes to subordinate parts of a complex building (for example, lower wings or rear ranges) may provide the most appropriate place for such installations: by respecting the hierarchy of the building in the location of installation, any harm to the building's special interest will be reduced.
- Exceptions may include highly graded listed buildings (Grade I and II*) whose significance may be such that the installation of such panels on roof slopes of less prominence would not be appropriate.

100. The physical work necessary to install and maintain panels will not generally prevent their installation.

- The fixings, wiring and/or pipework that form an integral part of any installation will not usually have a significant effect on the special interest of a listed building and may be compared with those associated with other modern services, such as electricity, plumbing and central heating.
- As with all works to listed buildings, care should be taken to design their installation and maintenance so as to avoid or minimise any incidental, harmful impact on the special interest of the building.
- Exceptions exist in respect of some types of roofs, which might be damaged or threatened by such installations:
    - Certain stone slate roofs are unlikely to be able to accommodate installations due to the potential fragility of the material, the way in which it might be laid, the difficulty of making such installations and, in some cases, the difficulty of replacing the material.
    - Thatch roofs are also not appropriate for installations, both because the contrast in character would be especially pronounced and unfortunate and because it would be unwise to add any additional fire risk to such a roof.

101. Where panels can be mounted on outbuildings or on land associated with a listed building, provided they are not of greater prominence, this will generally be preferable to their installation on the buildings itself.

- The installation of panels away from the listed building can often be done without any direct harm to the building's special interest.
- However, consideration will still need to be given to the effect of an installation on the setting of the listed building.
- Where an installation can be made away from the listed building, and would cause no, or less, harm to its special interest, there will be less of a justification to install panels on the building itself.

102. For further information see:

- Generating Energy in Your Home
- Energy Efficiency and Historic Buildings: Solar Electric (Photovoltaics)
- Installing Electrical Energy Storage Systems and Batteries in Historic Buildings

Heat pumps

103. The installation of heat pumps will generally be acceptable, provided that they are sympathetically sited.

- Such installations have the potential to detract from the special interest of most listed buildings, particularly for externally mounted air source heat pumps, as a result of their visual incongruity.
- Care needs to be taken with the installation of the pump and associated kit; for example, there may be additional archaeological considerations in historic sites.
- In certain cases, the physical installation works may cause unacceptable harm.
- Listed building consent will always be required for the installation of heat pumps.

104. For further information see:

- Installing Heat Pumps in Historic Buildings
- Generating Energy in Your Home
- Historic England (2023) Heat Pumps in Historic Buildings

Electric vehicle charging points

105. Domestic off-street electric vehicle charging points will generally be acceptable.

- Charging points should be located in discreet places where possible.
- Care will need to be taken with location of service runs, etc. and where ground works are needed with the potential to impact on archaeological remains
- If fixed to the listed building, they will likely require listed building consent.

Adaptations to improve the resilience of listed buildings

106. Some typical adaptations that can improve a building's resilience to the impacts of climate change are set out below, but this is not exhaustive. Those discussed are likely to need listed building consent and, if they materially affect the external appearance of a building, they are also likely to need planning permission.

107. Examples of adaptions to improve resilience to climate change include:

- External awnings, blinds and shutters to reduce overheating. Whilst they are likely to be acceptable in some cases, they are unlikely to be acceptable where they adversely impact on the architectural interest of the building, or group of buildings. However, there may be historical precedents in the surrounding area, or on similar listed buildings.
- Effective rainwater management is fundamental to building resilience. Changes to rainwater goods to accommodate increased rainfall are likely to be acceptable in most cases. However, care should be taken to consider management strategies or designs that minimise impact on historically significant rainwater goods, with changes limited to those necessary to maintain function.

108. Depending on local circumstances, buildings may also need to be made more resilient to flooding or changes to ground conditions, from increased rainfall or drought, which may impact on structural stability. Such interventions are likely to be less common and are not considered in detail here.

4 A positive strategy for historic buildings and climate action

109. Local planning authorities and other plan-making bodies have a variety of planning tools available to direct and guide decision-making. This ranges from policy making and guidance in Local Plans, Supplementary Planning Documents (or Supplementary Documents) and Neighbourhood Plans to planning mechanisms to grant or restrict permitted development. This section sets out how such planning tools can be best used to deliver a positive strategy for historic buildings that proactively supports climate action.

Evidence gathering

110. Effective policy and guidance are evidence based. As such they require a clear understanding of the causes of climate change and the hazards and risk it poses, the significance of the historic environment, and the potential contribution that the conservation of the historic environment may make towards addressing climate change. This will then allow an understanding of the opportunities and challenges present for mitigating and adapting to climate change without the loss of or unacceptable harm to the significance of heritage assets. The evidence base needs to inform these matters in an integrated way focusing on climate change and its relationship with the historic environment.

111. Mapping climate impacts and their effects using geographical information systems can be beneficial in evidencing policy options for local plans and helping to understand threats and opportunities in relation to historic buildings.

Development plans and other area-based strategies

112. Section 19 of the Planning and Compulsory Purchase Act 2004 (as amended by the Planning Act 2008) requires each LPA to identify the strategic priorities for the development and use of land in the authority's area, and states: 'Development plan documents must (taken as a whole)

include policies designed to secure that the development and use of land in the LPA's area contribute to the mitigation of, and adaptation to, climate change' (paragraph 1A).

113. Development plans should take a proactive approach to mitigating and adapting to climate change (NPPF, paragraph 153) while at the same time setting a positive strategy for the conservation and enjoyment of the historic environment (NPPF, paragraph 190). A consistent approach on climate change across plans can help reduce uncertainty and lead to cumulative benefits, including those for the conservation and enhancement of the historic environment.

Planning policy to deliver a positive strategy

114. Planning policy forms the basis for effective decision-making and gives clarity about how development proposals can be realised both at a spatial level, through site allocations, and at a site based level. Development plans offer an opportunity to respond to the specific challenges posed by climate change in the local area. Site/building policies should include those on repairs and whole-building retrofit measures, as well as the installation of renewable energy sources and improving energy efficiency.

Opportunities for integrating climate and heritage policies

115. It is, therefore, important that an integrated approach to climate change and the historic environment is taken in the development of local plan policies.

116. Building repair, re-use and retrofit will, if carried out carefully, contribute to the reduction of carbon emissions enabling their prolonged use. Policies can identify opportunities by integrating policies on reducing the operational carbon of a building, improving energy efficiency, and/or improve a building's, or area's, resilience to the impacts of climate change with those to protect the historic environment.

117. Policies on embodied carbon may help to reduce carbon emissions from new development and help achieve net zero targets, whilst simultaneously preserving historic buildings. Similarly, local policies may explore the use and reuse of buildings materials, whilst encouraging the circular economy.

118. Although not the focus of this Advice Note, there are opportunities in local policies to integrate climate change and historic environment policies to improve historic areas and the spaces around buildings. For example, local policies to control parking on front gardens can increase natural drainage, encourage nature recovery and improve the local environment, health and well-being, maintaining the character

or appearance of a historic area. Polices to encourage active travel can be integrated with streetscape improvements in conservation areas, maximising benefits for all.

119. Historic green spaces such as parks and domestic gardens, including those in conservation areas, along with street trees, also have important benefits in preserving or enhancing the character of those areas and improving heat resilience in urban settlements.

Supplementary planning documents and design codes

120. Supplementary planning documents can also deliver climate action through the provision of more detailed guidance on mitigating and adapting to climate change whilst protecting the historic environment. For example, through detailed guidance on the use of micro-generation or retrofitting historic buildings, or nature recovery and historic landscape guidance.

121. Design codes can also be useful in matters such as managing change to historic buildings in the context of energy efficiency. However, neither supplementary guidance nor a design code would be able to go beyond or indeed substitute the need for policy requirements in a development plan.

Conservation area and other management plans

122. Some councils are choosing to review or develop conservation area management strategies to support carbon reduction as a form of mitigation, and climate change adaptation. For instance, open space and green infrastructure strategies as part of a conservation area management plan can help local authorities to plan and manage open space, for example by providing space for renewables' infrastructure for the mitigation of climate change, or, providing green space to help manage flooding and to provide cool areas, as climate change adaptation.

123. Management plans for other historic places and assets, such as world heritage sites and registered parks and gardens, can also be used to promote climate change action integrated with historic environment policies.

Neighbourhood plans

124. Neighbourhood plans, which also form part of the development plan, may offer additional opportunities to provide distinctive polices on climate change and the historic environment at a neighbourhood level. Depending on the timetable a local plan review, the neighbourhood plan may again offer an opportunity to bring forward, at an earlier date, policies that support climate change mitigation and adaptation, such as the retrofitting of historic buildings.

Other planning mechanisms

Local and Neighbourhood Development Orders

125. Local Development Orders grant planning permission for the types of development specified in the Order within a defined area (see the Planning Practice Guide: When is permission required?). Local Development Orders remove the need for separate planning applications to the LPA and can be used to remove the need for repetitive planning applications for works in response to climate change that are appropriately specified and supported by an LPA. Where an area covered by a Local Development Order contains listed buildings, listed building consent would also be needed to alter, or extend, listed buildings.

126. Neighbourhood Development Orders are similar in scope but relate to Neighbourhood Plans and can grant planning permission for specific development within a defined area.

Local Listed Building Consent Orders and Listed Building Heritage Partnership Agreements

127. Local Listed Building Consent Orders (LLBCOs) and Listed Building Heritage Partnership Agreements (LBHPAs) are useful as they clarify to listed building owners what works are permissible - including those in response to climate change - and reduce the number of listed building consent applications that LPAs have to deal with.

128. An LLBCO allows the LPA to grant listed building consent for routine or minor changes to any identified listed buildings in their area, over an extended period of time. This consent is granted provided that the works either do not harm the significance of the building or are outweighed by the public benefits.

129. For example, an LLBCO could cover the fitting of solar panels or double-glazing, outlining the circumstances in which such an item can be fitted, and detailing any conditions such as location, materials and fixings. They do not, however, remove the need for the LPA to assess whether listed building consent should be granted, in the preparation for the LLBCO.

130. An LBHPA is similar to an LLBCO, in that it allows the owner and the LPA to agree on the significance of the building(s) and what long-term packages of work may be granted listed building consent through the Agreement. However, they are used in relation to complex buildings, or groups of related buildings in single ownership. An example of LBHPAs in practice might include long-term consents for work to mitigate or adapt to climate change, such as changes to windows in a large group of buildings in one ownership.

5 Glossary

Adaptation (for climate change) – The measures we can take to plan for and respond to the current and future impacts of climate change in order to moderate harm or exploit beneficial opportunities.

Adapting (buildings) – Buildings can be adapted to lower their impact on the environment (e.g. carbon reduction measures) and/or to ensure they can respond better to their environment (such as measures to improve flood resilience). This means buildings can be adapted to deliver climate change mitigation and/or climate change adaptation, help them reduce carbon emissions or improve energy efficiency to support climate change mitigation, and they can also be adapted to respond to the current and future impacts of climate change to support climate change adaptation.

Article 4 direction – A direction made under Article 4 of the Town and Country Planning (General Permitted Development) (England) Order 2015 which withdraws permitted development rights granted by that Order.

Blue infrastructure – see green and blue infrastructure.

Carbon – Shorthand term for carbon dioxide (CO_2), which is a greenhouse gas and is the most prominent in causing climate change. The impact of the other four gases – water vapour (H2O), nitrous oxide (N2O), methane (CH4) and ozone (O3) – is often expressed as carbon dioxide equivalent or CO_2e.

Circular economy – The circular economy is a system where materials never become waste and nature is regenerated. In a circular economy, products and materials are kept in circulation through processes like maintenance, reuse, refurbishment, remanufacture, recycling, and composting. The circular economy tackles climate change and other global challenges, like biodiversity loss, waste, and pollution, by decoupling economic activity from the consumption of finite resources.

Climate action – Action that helps reduce emissions and adapt to climate change.

Climate change – A change of climate which is attributed directly or indirectly to human activity that alters the composition of the global atmosphere and which is in addition to natural climate variability observed over comparable time periods. (United Nations Framework Convention on Climate Change, article 1).

Conservation (for heritage policy) – The process of maintaining and managing change to a heritage asset in a way that sustains and, where appropriate, enhances its significance (NPPF).

Designated heritage asset – A World Heritage Site, Scheduled Monument, Listed Building, Protected Wreck Site, Registered Park and Garden, Registered Battlefield or Conservation Area designated under the relevant legislation. National Policy Statements include Protected Wreck Sites and Protected Military Remains amongst the categories of designated heritage assets (NPPF).

Embodied carbon – The carbon emitted over the whole lifecycle of a building, including during construction, maintenance, refurbishment, and demolition. It considers carbon emissions released throughout the supply chain including extraction of materials from the ground, transport, refining, processing and assembly, in use and end of life.

Energy efficiency – Measures to reduce the amount of energy required for products and services.

Greenhouse gases (GHGs) – A gas that absorbs and emits radiant energy at thermal infrared wavelengths, causing the greenhouse effect. Primary greenhouse gases in Earth's atmosphere are water vapour (H2O), carbon dioxide (CO2), methane (CH4), nitrous oxide (N2O), and ozone (O3). Human generated GHGs are the primary cause of global warming and climate change.

Green and blue infrastructure – A network of multi-functional green and blue spaces and other natural features, urban and rural, capable of delivering a wide range of environmental, economic, health and wellbeing benefits for nature, climate, local and wider communities and prosperity.

Harm (to a heritage asset) – Change to significance, which would affect adversely that significance, by damaging or taking way from its archaeological, architectural, artistic or historic (NPPF) interest.

Heritage asset – A building, monument, site, place, area or landscape identified as having a degree of significance that because of its heritage interest merits consideration in planning decisions. This includes both designated heritage assets and assets identified by the LPA including local listing (NPPF).

Historic environment – All aspects of the environment resulting from the interaction between people and places through time, including all surviving physical remains of past human activity, whether visible, buried or submerged, and landscaped and planted or managed flora (NPPF).

Maladaptation – Changes to a building which prevent it from performing appropriately in relation to energy efficiency, carbon reduction, building performance, or the health, safety, well-being and comfort of occupants.

Material consideration – Material considerations are matters which should be taken into account in deciding a planning application or in an appeal against a planning decision.

Mitigation (for climate change) – An intervention to reduce, absorb or remove greenhouse gases from the atmosphere with the primary function of limiting global warming to avoid the worst impacts of climate change.

Mitigation (for the historic environment) – Action to reduce harmful impacts on the historic environment. The action of climate change on the historic environment can, for instance, be an impact for which mitigation can be sought.

Net Zero – the reduction of greenhouse emissions by 90% or more compared to a set baseline year, with the remaining emissions balanced by absorbing or removing them. The UK's Net Zero baseline year is 1990. The UK is committed to a target of Net Zero by 2050.

Net Zero carbon operational energy – for buildings in operation – When the amount of carbon emissions associated with the building's operation on an annual basis is zero or negative. A Net Zero carbon building is highly energy efficient and powered from on-site and/or off-site renewable / green energy sources, with any remaining carbon balance offset.

Net Zero carbon construction – for major renovations and for new buildings – When the amount of carbon emissions associated with a building's materials and construction stages up to practical completion is zero or negative, through the use of offsets or the net export of on-site renewable energy.

Net Zero carbon whole life – When the amount of carbon emissions associated with a building's construction, operational and demolition stages over the life of the building, including its disposal, are zero or negative.

Operational carbon – The carbon associated with the in-use operation of a building. This usually includes carbon emissions associated with heating, hot water, cooling, ventilation, and lighting systems, as well as those associated with cooking, equipment, and lifts (that is both regulated and unregulated energy uses), but can account for any activities that expend carbon, for example the materials and processes involved in maintaining and repairing a building.

Overheating – Discomfort, and possible health risks, to occupants caused by the accumulation of warmth within a building.

Resilience – The capacity to withstand or recover quickly from a hazardous event or change in climate while retaining functionality and/or significance.

Responsible retrofit – An informed and integrated attitude to retrofit in a way that enables people to reduce the operational carbon of a building, improve energy efficiency, and/or improve a building's resilience to the impacts of climate change. Responsible retrofit will take into account the building's location, context, design, construction, materials and use, to ensure retrofit measures perform well and avoid adverse impacts to health, heritage and the natural environment.

Retrofit – The addition of new technologies or features to an existing building to change the way it performs or functions.

Setting of a heritage asset –The surroundings in which a heritage asset is experienced. Its extent is not fixed and may change as the asset and its surroundings evolve. Elements of a setting may make a positive or negative contribution to the significance of an asset, may affect the ability to appreciate that significance or may be neutral (NPPF).

Significance (for heritage policy) – The value of a heritage asset to this and future generations because of its heritage interest. The interest may be archaeological, architectural, artistic or historic. Significance derives not only from a heritage asset's physical presence, but also from its setting. For World Heritage Sites, the cultural value described within each site's Statement of Outstanding Universal Value forms part of its significance (NPPF).

Traditional building/construction – Traditional buildings are generally of solid wall (that is not cavity walls) or solid timber frame construction, which were built before 1919. Traditional construction differs significantly from modern construction, having different materials, construction methods and design. Traditional buildings make up about 21.5% of the UK's total building stock.

Unlisted building (in a conservation area) – In this Advice Note this term is used to denote a building in conservation area that is not included on the national list of buildings and identified as being of special architectural or historic interest.

Whole Building Approach – Considers a building's context to find balanced solutions that save energy, sustain heritage significance, and maintain a comfortable and healthy indoor environment. It also considers wider environmental, cultural, community and economic issues, including energy supply. It can help to manage the risks of unintended consequences.

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