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.

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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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