

Energy Efficiency, Renewables and The Historic Environment

Supplementary Planning Document

DRAFT



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Section 1 – Background Context

1.1 Introduction

This Supplementary Planning Document (SPD) is intended to provide general advice and guidance to property owners considering making energy efficiency or renewable energy improvements in County Durham’s historic environment. This can include works to listed buildings, non-designated heritage assets, and to properties within conservation areas. Within County Durham there are over 3,000 listed buildings, 93 Conservation Areas, and a World Heritage Site in Durham City. There are also numerous Registered Parks and Gardens and Battlefields. [Historic England](#) hold information on listed buildings and information regarding conservation areas in County Durham can be found on the [Durham County Council website](#).

Taking steps to improve the energy efficiency of historic buildings is important and it is widely recognised that reduced energy costs can improve the appeal and perception of living within historic buildings, helping to avoid them becoming vacant and falling into disrepair. It is also recognised that the historic environment should play its part in decarbonising, supporting local and national net zero goals and adapting to climate change. However, it is vital that the physical changes of such measures are consistent with the aims of heritage protection and Government and local planning policies. In accepting that some change will be necessary it is critical that works are carefully managed so that the historic environment and the heritage assets directly affected by the proposals are conserved or enhanced in a manner appropriate to their significance.

1.2 Feedback

This is the first draft of this SPD. If you would like to comment on its content you can do this by:

- email to spatialpolicy@durham.gov.uk
- post, you can send us your comments to our freepost address (all you need to do is write this one line on an envelope - no other address details or postage stamp are needed): **FREPOST Spatial Policy**
- or by using our planning consultation portal: <https://durhamcc.objective.co.uk>

Please return your submission by 5pm on 14th July 2024.



1.3 Aims of the guidance

This SPD should not be regarded as providing a *one-size-fits-all* solution when considering energy saving measures and alterations to heritage assets. Historic buildings are highly diverse in terms of age, type, construction, materials, plan form, architectural style, degree of alteration over time and their sensitivity to alterations. Location also plays a fundamental role and may itself be of significance, such as a conservation area or a historic park and garden, so what may be considered appropriate and acceptable in one case may not be in another. The method of undertaking energy saving measures and resulting impacts must be based on the individual circumstance and context. Each building is unique and should be considered on a case-by-case basis.

Historic buildings often need different energy efficiency solutions when compared to more modern buildings. While modern buildings can benefit from single interventions without consideration for the whole building, historic buildings must have a whole building approach taken before any energy efficiency improvements are undertaken. This is based on an understanding of the building in its context to make informed decisions in order to find the correct balance that saves energy and conserves heritage significance.

Historic buildings are a finite resource and are inherently sustainable having been, in most cases, well-constructed from high quality, locally sourced materials by local craftsman. Their embodied energy (the energy expended and encapsulated within the fabric of a building in its construction) means that their retention and care is both logical and consistent with the modern concepts of sustainability and with the ambitions of reducing carbon emissions. Historic buildings have often stood for multiple generations over many years and through careful management will continue to do so.



Solar panels on terraced street

1.4 Heritage Assets

This guidance relates to both Designated and Non-Designated Heritage Assets.

Designated heritage assets can be defined as:

- UNESCO World Heritage Sites
- Scheduled Monuments
- Listed Buildings
- Protected Wreck Sites
- Registered Park and Gardens
- Registered Battlefields
- Conservation Areas

Non-designated heritage assets are defined as *a building, monument, site, place, area or landscape identified by the local planning authority as having a degree of significance meriting consideration in planning decisions.*

Significance is the value of a heritage asset to this and future generations because of its heritage interest that can be archaeological, architectural, artistic or historic.

Historic England's *Conservation Principles Policies and Guidance* (2008) provides a framework for identifying historic values that may be attached to a place the sum of which informs the designated heritage assets significance. These values can be grouped into four categories:

- **Evidential value:** the potential of a place to yield evidence about past human activity.
- **Historical value:** the ways in which past people, events and aspects of life can be connected through a place to the present - it tends to be illustrative or associative.
- **Aesthetic value:** the ways in which people draw sensory and intellectual stimulation from a place.
- **Communal value:** the meanings of a place for the people who relate to it, or for whom it figures in their collective experience or memory.

Significance derives not only from a heritage asset's physical presence, but also from its setting. This is defined as 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.

1.5 Fundamental Principles

It is often perceived to be that older buildings are not energy-efficient compared to modern buildings, and consequently must undergo drastic alterations to improve their performance. However, it is often more nuanced, and commonly held beliefs about poor performance are not always entirely justified. Regardless, the energy and carbon performance of historic buildings can often be enhanced.

Achieving the right balance between benefit and harm however may not be straightforward and there can be unintended consequences when energy efficiency measures and renewable energy features are implemented. These include harm to the significance of the heritage asset and failure to achieve the predicted savings or reductions in environmental impacts. The right balance is best achieved through an approach focused on an understanding of the building, its construction, significance, and the various factors affecting energy use, that should be the starting point to devising an energy efficiency strategy. This '*whole building approach*' ensures that energy-efficiency measures are suitable for the individual building.

There may not be a '*one-size-fits-all*' solution to delivering energy savings in historic buildings, but some general principles do apply:

Understanding...

- the significance of the individual building and potential harm from any changes.
- the influence of local environmental factors such as exposure to sun, wind and rain.
- the original design, construction, condition and previous adaptations of the building.
- the existing building fabric and its current performance and behaviour.
- the condition and operation of the building's existing services.
- the requirements, aspirations, aims and potential impacts of the energy saving or energy production measures.
- available resources: financial; skills; materials
- the building and site-specific opportunities and constraints.

Adapted [from Historic England, Energy Efficiency and Historic Buildings How to Improve Energy Efficiency \(2018\)](#)

A true '*whole building approach*' is one that uses this 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. A whole building approach also considers wider environmental, community and economic issues, including energy supply and generation. It ensures improvements are suitable, proportionate, timely, well integrated, properly coordinated, effective and sustainable, and helps to highlight and resolve uncertainties, reconcile conflicting aims, and manage the risks of unintended consequences. Most of all, it deals with specific situations as opposed to generalisations. Opportunities and constraints can vary widely depending on context. The optimum solution in one case might be quite different in another, even if buildings appear similar. Therefore, a site-specific approach is needed: one that considers the interrelationship between building fabric, engineering services, setting and people.

It is also important to understand that historic buildings perform very differently to modern buildings. Buildings of a solid wall construction, typically those constructed up until around the 1920s, need to be able to '*breathe*'. This means there is a need for permeability and the ability for moisture to pass freely through their walling. This relies on moisture being able to evaporate into the external and internal atmospheres. Internally moisture evaporates and enters the internal environment and relies on good ventilation to be evacuated into the external atmosphere. This process is critical for the health of the building and its occupants and relies on several factors to function correctly including permeable materials such as lime mortar, permeable paint finishes and traditional, passive ventilation routes such as chimney flues and natural ventilation through doors and windows.

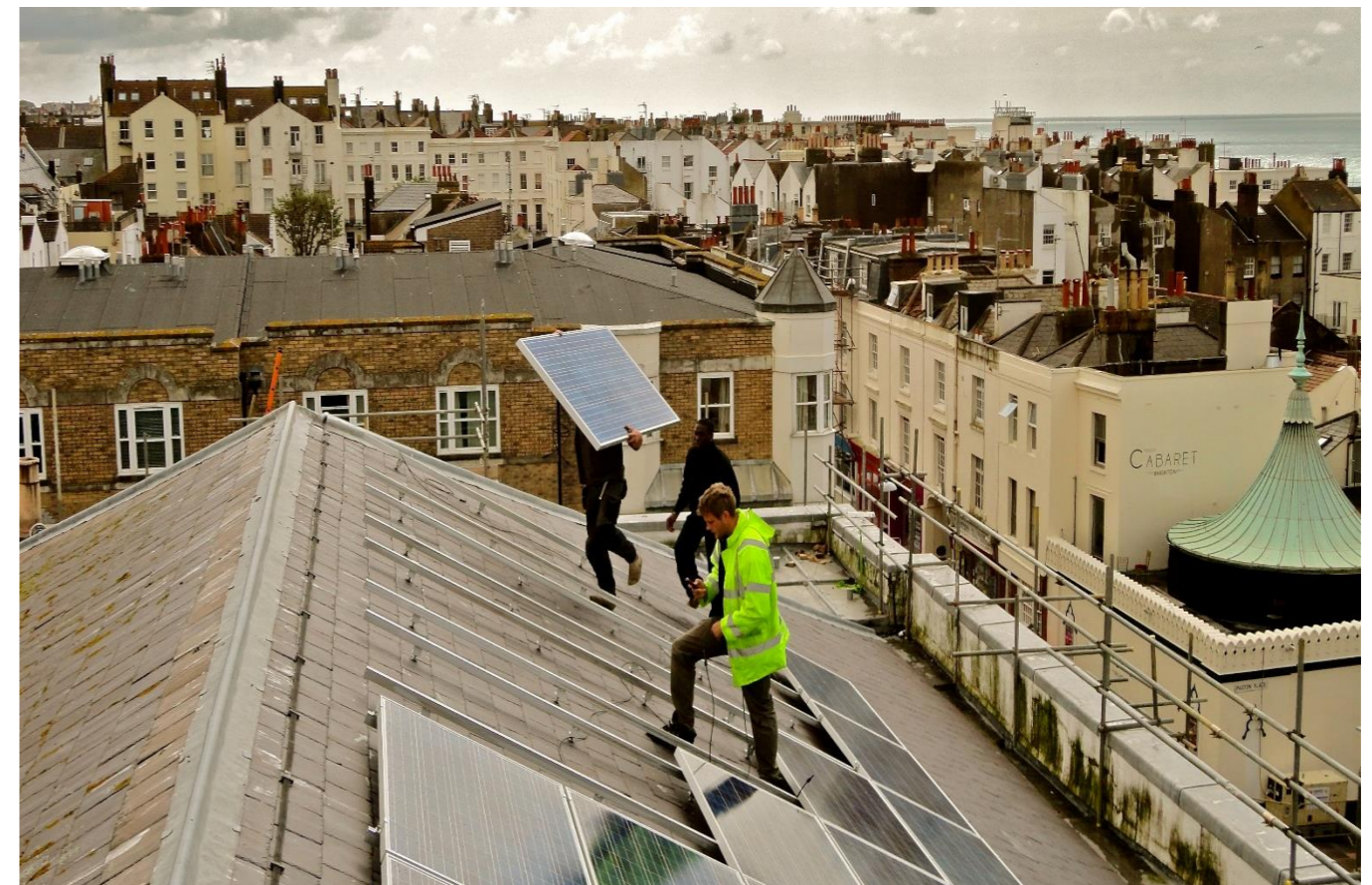
County Durham is a very diverse county, whose geography covers many historic urban areas, such as Durham City, coastal settlements along the North Sea coast such as Seaham, through the former Durham coalfield, to upland Pennine villages within the North Pennines Area of Outstanding Natural Beauty. The local climate and conditions vary drastically along with the range of settlements and rural landscapes and this can have a great impact on what energy efficiency are most suitable in each individual situation.

1.6 Energy Generation

Renewable energy technology, also known as micro generation, is today readily available. This includes solar thermal and solar photovoltaic panels and slates, wind and hydro turbines, ground and air source heat pumps and biomass heating systems. These can have varying impacts on the historic environment, ranging from none to significant harm to the significance of a listed building, and/or none to adverse visual affects to the character and appearance of a conservation area. The type of renewable, its siting and implementation therefore requires very careful consideration.



Wind turbine within the grounds of an old farmhouse



Installation of solar panels

1.7 Step by Step Planning

The following is a general guidance plan when considering energy saving measures within the historic environment.

Step 1. Understand the building

- Assess and evaluate the building.
- Assess the current condition of fabric and services. For example, what needs replacing or repairing now, or in the near future?
- Are any regulations changing which will impact your future options, e.g. the phasing out of gas boilers?
- Consider the heritage value and significance. How old is the building? What architectural style is it? What are the features that contribute to its character and significance?
- Assess the energy performance of the building envelope and its services (heating, lighting and appliances). For example, are parts colder than others? How old is your central heating system?
- Review your Energy Performance Certificate.
- Think about the behaviour of the building fabric in response to heat and moisture. For example, do parts suffer from condensation, mould or dampness?
- Consider the users' occupational requirements. For instance, how are different parts of the house used and at what times of the day?

Step 2. Identify opportunities and interdependencies with other planned works

- Can existing historic features of significance e.g. windows, be refurbished in the first instance, rather than replaced. This could have a positive impact on an asset's significance through the retention of key features, as well as being a more economic option.
- Refurbishments, repairs and extensions can sometimes be disruptive and costly. Using these occasions to carry out energy efficiency or renewable energy measures at the same time is likely to save money, time and disruption. For instance:
 - when replacing kitchen or bathroom fittings consider adding internal solid wall insulation or installing mechanical ventilation with heat recovery
 - when laying new flooring consider adding floor insulation
 - when re-roofing, renew insulation and consider the installation of solar photovoltaic or solar thermal heating technology.

Step 3. Evaluate effectiveness and risks

- Understanding the carbon cost effectiveness of measures will help you decide which measures to install to achieve the maximum carbon emissions reduction for your money.
- The changing costs of energy efficiency technologies and domestic fuel costs means that the payback period will vary.
- A common concern when adapting historic buildings is the maintenance of adequate ventilation so that condensation and damp problems are avoided. This is particularly important to bear in mind when draught-proofing and insulation are introduced. Older buildings rely on natural ventilation (through windows, chimney and floor voids) to dissipate air borne moisture. When these routes are blocked moisture generated by day-to-day household activity is likely to condense on the coldest surface and cause damp and mould. To avoid this, improved and potentially mechanically assisted ventilation may need to be installed.
- Consideration should be given to works which may impact on protected species, particularly in relation to works affecting roofs. The cost and time implications should be factored into planning works.

Step 4. Assess impact of measures on heritage value and significance

- Section 2 of this Guidance gives detailed advice on balancing conservation issues with the introduction of energy saving and renewable energy measures. Once you have considered this section you will be better able to assess which measures are likely to improve your home's energy efficiency and reduce its environmental impact while conserving the building's special interest, character and significance.

Step 5. Implementation

- After completing Step 4, a set of appropriate energy efficiency and/or renewable energy measures should emerge.
- The final performance of any measure and its impact on energy bills will depend both on the quality of the installation and occupant behaviour.
- As with any building project, it is recommended that independent professional advice is sought before any works begin.
- Finally, seek advice from the LPA regarding the requirement for any permissions.

1.8 Policy Context

Designated heritage assets, such as listed buildings, are protected by law under Planning (Listed Building & Conservation Areas) Act 1990. They are designated in recognition of their architectural or historic interest and the heritage and cultural significance and value that they possess.

As well as the direct physical impact on the significance of heritage assets, the impact on their setting is also an important material consideration when determining planning applications. The Act is underpinned by Government policy in the form of the **National Planning Policy Framework**, specifically, Section 16 - *Conserving and enhancing the historic environment*. This policy relates to both designated and non-designated heritage assets.

In County Durham, heritage assets are protected under the provisions of **County Durham Plan** which is the starting point for decision making. The following policies are all relevant to developments relating to the historic environment.

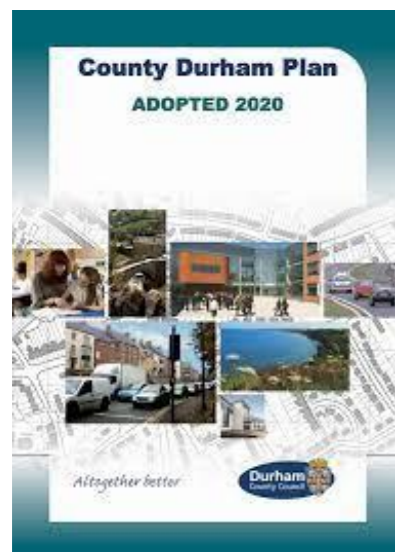
- Policy 29 – Sustainable Design
- Policy 33 – Renewable and Low Carbon Energy
- Policy 44 – Historic Environment
- Policy 45 – Durham Castle and Cathedral World Heritage Site
- Policy 46 – Stockton and Darlington Railway

An increasing number of areas within County Durham also have adopted Neighbourhood Plans. These plans also contain policies specifically related to the historic environment and should be consulted as part of any proposal.

Central to primary legislation and Government policy is the emphasis on the presumption in favour of sustainable development. This includes the protection of heritage assets, recognising that these assets are an irreplaceable resource, and should be conserved in a manner appropriate to their significance.



Energy generation on an historic building in Teesdale



1.9 Planning Requirements

1.9.1 Alterations to a listed building

Listing protects the building in its entirety inside and outside and potentially buildings and structures within its 'curtilage'. Listed Building Consent (LBC) is required for physical alterations that might affect its special architectural or historic interest. Carrying out work without LBC when such consent is required is a criminal offence. Works deemed as repairs or generally maintenance may not require LBC, but this depends on the extent and nature of those works.

Advice should be sought from the Local Authority to establish what can and cannot be undertaken without consent. Depending on the nature of the works proposed planning permission may be needed in addition to LBC and approval under building regulations. Consideration of the impacts on protected species must be taken into account when contemplating works, particularly within roof spaces.

1.9.2 Alterations to a building within a conservation area

Permitted development (PD) rights that normally apply to relatively minor alterations to residential dwellings may be reduced in some conservation areas, due to Article 4 Directions being in place. Therefore, depending on the location of the building and the type of work proposed planning permission may be required for alterations such as to the roof (including potentially solar panels), replacement windows, and the rendering of external brick and stone walls (potentially impacting the installation of external insulation).

1.9.3 Alterations where potential archaeological interest exists

The fabric of a building or the ground upon which it stands may have archaeological interest. Internal alterations or below ground works (e.g. ground source heat pumps) may impact on archaeological remains. If substantial works are planned to historic buildings or ground works in an area that may be of archaeological interest it must be established whether there may be archaeological implications. Works within Scheduled Monuments will require Scheduled Monument Consent from Historic England.

1.9.4 Building Regulations

Many types of building work need to conform to the Government's Building Regulations. Part L relates to conserving energy and sets out a requirement to improve the thermal performance of the building. For heritage assets work should comply with energy efficiency standards to the extent that it is '*reasonably practicable*'. Where this affects existing buildings, the regulations also set standards of energy-efficiency requirements for extensions and other significant changes to a building.

1.9.5 Pre-Application Enquiries

Given the unique nature of the historic environment you would be advised to seek pre-application advice from the Local Authority.

If you believe you may need planning permission or listed building consent, or want confirmation of whether or not any form of permission is required, Durham County Council offers a high-quality pre-application service. Through this route you can receive professional advice on what permissions or consents will be required, and 'in principle' guidance on the acceptability of development proposals.

This service will help you find out if your proposal is likely to be acceptable without the expense of making a formal planning application. [Planning advice and enquiries - Durham County Council](#)









Energy generation on a stone building in a conservation area

Section 2 Detailed Guidance – Energy Efficiency Measures



2.1 Building Fabric, Energy Efficiency Improvements

2.1.1 Windows




Type	Key Guidance Notes	Example images	Risk - Cost	Potential Heritage Impacts	Potential Mitigation	Constraints / Permissions
Fitting of curtains	<ul style="list-style-type: none"> - Simple unintrusive measure which would provide immediate impacts on efficiency. - Acceptable method in terms of visual appearance. - Energy saving curtains are available on the market that insulate against the heat and the cold due to the multi layered construction. 		Low risk, low cost	Nil	N/A	Nil
Draft proofing / Repair / Refurbishment	<ul style="list-style-type: none"> - Reduces uncontrolled ventilation, heating demand and carbon emissions. - Retains original historic windows. - Professional joinery repair, restoration and installation will be needed. - Care should be taken to ensure the strength of the frame is not compromised. This is particularly the case with historic sash windows where the timber sections are often very slender. - Improves visual appearance 		Low risk, can be moderate cost depending on age and style of the windows	Beneficial by preservation of historic windows, conserving and enhancing character and appearance. Prolongs lifespan of window	N/A	Listed Building Consent typically not required for repair / restoration, although this should be confirmed
Shutters	<ul style="list-style-type: none"> - Reinstatement should be based on historic evidence. - Replacement or new shutters should be sympathetic to the design and materials of the window and replicate the original or take design cues from others in the area. - Internal shutters good at reducing heat loss less effective against heat gain. - Performance of existing shutters can also be enhanced by draft proofing. 		Low risk, low-medium cost	Beneficial by reinstatement of lost features enhancing character and appearance.	N/A	Listed Building Consent typically not required for repair / restoration, although this should be confirmed. Reinstatement would potentially require Listed Building Consent.

Type	Key Guidance Notes	Example images	Risk - Cost	Potential Heritage Impacts	Potential Mitigation	Constraints
Secondary Glazing	<ul style="list-style-type: none"> - Thermal enhancements, and can also reduce noise e.g. beside busy roads. - Design must be as discreet as possible with minimum visual impact on the existing window, achieved by careful alignment of framework and use of slim frames of appropriate colour - Ensure that any distinctive architectural detailing is not obscured by the frame of the secondary glazing. - Minimise the impact of permanent fixings required to secure the new frame. - Consider fitting secondary glazing within a removable frame - More cost-effective option than full replacement, and ensures retention of historic windows 		Low-Medium risk, depending on specific building. Low-medium cost	<p>Lesser impact as original windows remain unaltered apart from fixing holes</p> <p>Can be visually noticeable externally.</p> <p>Beneficial as a reversible adaptation. Limited external visual impact.</p> <p>Retention of historic window frames</p>	Sensitive design to follow the original window's framework avoiding harm to architectural detailing.	If building is listed, Listed Building Consent would be required.
Retrofitting double glazing	<ul style="list-style-type: none"> - Surviving historic glass should be retained. - Some windows cannot be retrofitted due to their original form of construction. - Retrofitting standard double glazing is often harmful due to adverse impact on the appearance of historic windows. - Slim heritage double glazing has less impact on internal and external character and appearance 		Medium risk, medium cost	<p>Loss of historic crown glass that contributes to heritage significance.</p> <p>Can ensure retention of historic window frames</p>	<p>Less harm to character and appearance compared to standard double glazing.</p> <p>Allows retention of historic frames.</p>	If building is listed, Listed Building Consent would be required.
Replacement windows	<ul style="list-style-type: none"> - Original windows should be retained with loss a last resort and only when they cannot be repaired. - The design and detailing of windows is often a significant component of a building's overall appearance and character and constitute important historic fabric. - Window opening mechanism, material, profile, glazing pattern and details must be sympathetically replicated if in keeping. - uPVC not appropriate in listed buildings, but may be acceptable in certain instances were securing betterment. For example replacing an inappropriately designed modern timber top opening casement with a high quality uPVC true vertical sliding sash. 		High risk, high cost	<p>Loss of historic fabric and intrinsic historic features that contribute to significance. Strong justification required for historic window replacement.</p> <p>Loss of non-historic windows or inappropriately designed less contentious.</p>	Sympathetic materials, design and detailing of new windows that conserve and/or enhance character and appearance of the building.	<p>If building is listed, Listed Building Consent would be required.</p> <p>Full Planning Permission may be required if permitted development rights have been removed.</p>




2.1.2 Doors

Type	Key Considerations	Example images	Risk - Cost	Potential Impacts	Potential Mitigation	Constraints
Curtains	<ul style="list-style-type: none"> - Door curtains can provide excellent draft proofing. On large areas of glass can reduce both heating loads in winter and cooling loads in summer. 		Low risk, Low Cost	Nil	Nil	Nil
Draft proofing / Repair / Refurbishment	<ul style="list-style-type: none"> - Reduces uncontrolled ventilation, heating demand and resultant carbon emissions. - Fitting draft proofing strips around seals and letter box unobtrusive simple measures. - Retain original doors if they are of historic value to the building. Replacement should only be considered if repair cannot be undertaken. 		Low risk, low cost depending on the extent of works and age/style of door	<p>Beneficial by retention of historic doors, conserving and enhancing character and appearance.</p> <p>Prolongs life span.</p>	Nil	Listed Building Consent generally not required for repairs. Check with the Local Authority for confirmation.
Replacement	<ul style="list-style-type: none"> - Historic doors should be retained with loss a last resort and only when they cannot be repaired. - The design and detailing of historic doors add to the building's overall appearance and character and constitute important historic fabric. - Replacement of historic doors must be carried out sympathetically matching the original material, design style, and detailing. - Replacement of historic doors with upvc or composite alternatives often harmful. - If existing doors are incompatible with the period, character and appearance of the building, betterment should be secured. - Can require a skilled joiner to produce a suitably accurate match to historic doors. 		Medium-High risk, Medium-high cost	<p>Loss of historic fabric and intrinsic historic features that contribute to significance. Strong justification required for historic door replacement.</p> <p>Loss of non-historic doors may be less contentious.</p>	Sympathetic materials, design and detailing of new doors that conserve and/or enhance character and appearance of the building.	<p>If building is listed, Listed Building Consent would be required.</p> <p>Full Planning Permission may be required.</p>




2.1.3 Roofs

Type	Key Considerations	Example images	Risk - Cost	Potential Impacts	Potential Mitigation	Constraints
Repair and general maintenance	<ul style="list-style-type: none"> - Regular maintenance of the roof covering, gutters and flashing to ensure water-tightness and run-off. This is important in safeguarding the building's performance. - Poor maintenance can leave the building vulnerable to the elements and prove costly in the long term. 		Low risk, cost dependant on extent of works and specific building.	Positive impact on long term use of the building, subject to use of appropriate materials	Nil	Listed Building Consent and/or planning permission may be required for wholesale replacement of roof coverings. Routine repairs would not typically require permission.
Loft Insulation (floor)	<ul style="list-style-type: none"> - Can have a very low impact by simply using traditional loft floor rolls, easy to install and can be boarded over to allow attic to be used. - Can be the simplest and cheapest way to insulate attic - Recommendations on thickness of loft insulation have changed in recent years, so check insulation is up to current recommended standards. 		Low risk, Low Cost	Nil-low physical impacts	Nil	Nil
Loft Insulation (roof)	<ul style="list-style-type: none"> - Insulation of pitched roof spaces at floor level is preferable; other options should only be considered where this is not practical or possible (e.g., if the roof space forms part of the living space) - Ventilation in the roof space must be maintained, this may require the addition of roof vents – these would need to be discreet conservation-style vents. - Avoid gaps, creating cold spots and thermal bridges. - Sprayed foams will not usually be acceptable as they are not easily reversible or permeable. - Care needs to be taken to preserve in situ historically significant fabric/internal surfaces. - Use of permeable materials is encouraged to minimise the risk of condensation. - Can be undertaken in conjunction with roof repairs and must maintain adequate ventilation. - Must not increase the height of the roof, insulation method will be dictated by the roof structure. - Additional weight of insulation can sometimes make it necessary to strengthen the roof. 		Level of risk, cost and suitability will depend on the particular building and significance of the existing roof structure.	Dependant upon particular building, heritage significance of the roof, level and method of interventions proposed.	<p>Measures informed by an understanding of the heritage significance of the roof structure, and consideration of possible long terms consequences of the works proposed.</p> <p>Should be reversible without damaging the historic fabric. Consider the risk of moisture</p>	<p>If building is listed, Listed Building Consent may be required depending on the extent and scope of works involved.</p> <p>Potential ecological constraints, e.g. bats</p>



2.1.4 Walls

Type	Key Considerations	Example images	Risk - Cost	Potential Impacts	Potential Mitigation	Constraints
Refurbishment / Repairs	<ul style="list-style-type: none"> - Sympathetic repairs of defective fabric can improve thermal performance along with stability of building. - The correct intervention will depend on the original wall material and construction that must be understood, but permeable materials should always be used. - Replacement of nonpermeable material such as cement render, plaster or pointing, with lime-based mortar can be highly beneficial. - Must conserve the character and appearance of the traditional building. 		Low risk, Low-medium cost dependant on extent of works	Positive subject to use of appropriate materials	Nil	<p>If building is listed, Listed Building Consent may be required.</p> <p>Planning permission may be required in certain cases e.g. if permitted development rights removed.</p>
Internal wall insulation	<ul style="list-style-type: none"> - Often inappropriate in listed buildings as difficult measure to implement without causing harm to fabric and character. - Permeable materials should be used but must not compromise features such as wall panelling, corncing, dado-rails, architraves etc. - Low impact approach is key with discreet materials. - Can reduce interior floor space which can be problematic in small rooms. - Internal service including electrical wiring, and heating pipework may need to be rerouted. 		Level of risk, cost and suitability will depend on the particular building and its significance.	Potentially negative impacts depending on particular building, may not be appropriate as a principle, or demanding very careful design, correct materials, good detailed and quality of workmanship.	Sympathetic design based on understanding of significance, building fabric and long term consequences.	If building is listed, Listed Building Consent would most likely be required. Check with Local Authority for confirmation.
External wall insulation	<ul style="list-style-type: none"> - Will likely have a fundamental impact on the character and appearance of heritage assets and may only be acceptable in limited circumstances. - Must use a material and finish which is appropriate to the building and sympathetic to its context. - Permeable materials should always be used on traditional buildings to allow them to breathe. - Cement based insulation products not suitable for use on historic buildings. - Great care is necessary to respect the detailing at roof eaves, window and door reveals, door surrounds, lintels etc to conserve the buildings character and appearance. - 		Level of risk, cost and suitability will depend on the particular building and its significance, but can range from medium to high.	Potentially negative depending on particular building. May not be appropriate in principle, or demanding very careful design	Sympathetic design based on understanding of significance and building fabric.	<p>If building is listed, Listed Building Consent would be required.</p> <p>Planning permission potentially required in certain cases.</p>

2.1.5 Floors



Type	Key Considerations	Example images	Risk - Cost	Potential Impact	Potential Mitigation	Constraints
Fitting of carpets / rugs	<ul style="list-style-type: none"> - Simple unintrusive measures such as fitting curtains and carpets would provide immediate impacts on efficiency. - Reduced radiant heat loss and drafts through floorboards. - New floor coverings should be permeable to avoid trapping moisture 		Low risk, Low cost	Nil	Nil	Nil
Insulation under / between joists	<ul style="list-style-type: none"> - Insulating suspended timber floors from below is usually preferable except where there is a historically significant surface to a ceiling below. - Installation from above should only be considered where impossible to insulate from below. - Great care must be taken to avoid damaging historic building elements (e.g., floorboards, skirting boards, door architraves). - Breathable materials should be used to maintain the passage of air and moisture. - If the works affect the existing floor / ceilings levels it could potentially be harmful. 		Medium to potentially high risk depending on the individual building and associated fabric/architectural feature impacts.	<p>Potentially negative depending on particular building.</p> <p>Can result in major fabric disturbance and loss.</p>	Clear methodology based on understanding of significance, fabric, impact and long term consequences.	If building is listed, Listed Building Consent would likely be required.
Insulation solid ground floors	<ul style="list-style-type: none"> - Where there are significant, undisturbed, historic floor surfaces the character and interest could be harmed by being lifted and installing insulation may be unacceptable. - Where there is a poor quality modern, replacement surface material or there is convincing evidence that a historic floor has been previously lifted and re-laid, or is damaged) the installation of under floor heating may be possible. - Limecrete should be used which can be used in conjunction with insulation and under floor heating systems whilst allowing the transfer of moisture. - Breathable materials should be used to maintain the passage of moisture and air. - Adding underfloor heating to an historic interior may be challenging, but where flooring has to be lifted and replaced for other reasons, it may be a discrete method of providing heating. 		Medium to potentially high risk depending on the individual building and associated fabric/architectural feature impacts.	<p>Potentially negative depending on particular building.</p> <p>Can result in major fabric disturbance and loss.</p>	Clear methodology based on understanding of significance, fabric, impact and long term consequences.	If building is listed, Listed Building Consent may be required. Check with Local Authority for confirmation.


2.1.6 Building Services

Type	Key Considerations	Example images	Risk - Cost	Potential Impact	Potential Mitigation	Constraints
Heating Distribution	<ul style="list-style-type: none"> - Need to determine and understand the existing arrangement, how effective it is and identify any defects. - Underfloor heating can be a discrete approach, where there will be no impact on historic flooring. - Seek to directly replace existing redundant or defective service interventions where possible as this will help to avoid further damage to historic fabric and surfaces. - Full system replacement can be a big undertaking causing significant fabric disturbance. 		<p>Could be low to high dependant on the individual building, nature and extent of the works involved.</p> <p>Lower risk if the building is not listed.</p>	<p>Potential harm resulting from fabric disturbance, removal, and both internal and external visual impact.</p> <p>Dependant upon the individual building and scope of proposed works.</p>	<p>Sensitively design and well-planned scheme to minimise fabric and visual impacts based on an understanding of significance.</p>	<p>If building is listed, Listed Building Consent would be required.</p> <p>Planning permission may be required.</p>
Ventilation	<ul style="list-style-type: none"> - Directly replace existing interventions where possible to avoid causing further damage to historic fabric and services. - Where new ventilation extracts are required, principal elevations should be avoided, and discreet positions sought. - If possible, remove visible redundant services from the walls where they are no longer required. - Where practical, integrate into existing features such as flues through chimney stacks. - Mechanical ventilation with heat recovery systems can draw fresh air into properties whilst retaining heat. Dependant on the property this could be considered although can have high initial costs and an understanding of impact on the asset's significance is important. - Mechanical Ventilation with Heat Recovery (MVHR) systems can deliver fresh air into a building whilst retaining heat. Should this option be considered, great consideration should be given to the potential impacts on significance due to the invasive work required in installation. 		<p>Low cost / risk for simple extract units in discrete positions. More invasive schemes, e.g. MVHR increase the scale of risk and cost.</p>	<p>Potential harm resulting from fabric disturbance, removal, and both internal and external visual impact.</p> <p>Dependent upon the individual building and scope of proposed works.</p>	<p>Sensitively designed and well planned scheme to minimise fabric and visual impacts based on an understanding of significance.</p>	<p>If building is listed, Listed Building Consent would potentially be required.</p> <p>Planning permission may be required.</p>




2.2 Renewable Energy Provisions



2.2.1 Solar

Type	Key Guidance Notes	Example images	Risk - Cost	Potential Heritage Impacts	Potential Mitigation	Constraints
Solar PV (Roof mounted)	<ul style="list-style-type: none"> - Discreet location will be a determining factor for successful installation for instance behind parapets and within other hidden areas of a roof. - Siting on later rear extensions or outbuildings would conserve historic roof coverings. - Consideration should be given to the surrounding topography of a settlement or building which may be part of a highly visible roofscape. - Assess the impact on significant views and the impact on the setting of heritage assets. - Additional weight of solar panels may need to be factored in, particular with historic roof structures. - When selecting panels, care should be taken to select discreet styles. - The effects of methods of fixings, fuse boxes, pipework, and cable distribution on the historic fabric of the building needs careful consideration. - Integrated systems rather than on a frame may be an option which is less visually intrusive. - Storage batteries linked to solar pv can make a notable contribution to reducing reliance on grid electricity. 		<p>Low-High Risk, medium cost</p> <p>Level of risk is dependent on the individual building/site, location and position, the type and method of installation and extent of works involved</p>	Potential harm resulting from fabric loss and disturbance, external visual impact, implications for structural integrity and associated works necessary.	Sensitively designed and well-planned scheme to minimise fabric and visual impacts based on an understanding of significance.	<p>If building is listed, Listed Building Consent would potentially be required.</p> <p>Full planning permission may be required in certain situations only, based on positioning, and whether permitted development.</p>
Solar PV (Ground mounted)	<ul style="list-style-type: none"> - An option for delivering the benefits of solar PV without invasive work into historic structures. - Preserves historic roof coverings and fabric. - Investigate discrete locations within the site, e.g. to the rear of properties rather than to the front. 		<p>Low-Medium Risk</p> <p>Medium cost</p>	Potential impact if sited in overly prominent positions which detract from an asset's setting.	Discrete positioning, planting may reduce visual impacts	Planning permission may be required, confirmation would be required on finer details, such as extent of proposal.

Type	Key Guidance Notes	Example images	Risk - Cost	Potential Heritage Impacts	Potential Mitigation	Constraints
Solar slates	<ul style="list-style-type: none"> - Solar slates or tiles can be a discrete option which if a suitable appearance is chosen can be incorporated into the roof covering. - A similar colour and appearance to the original roof covering materials should be chosen. - The wider visual impact needs to be considered for example if the building is part of a historic terrace or in a conservation area where the overall roofscape is part of its significance and visible in the public realm. - Storage batteries linked to solar pv can make a notable contribution to reducing reliance on grid electricity. 		<p>Low-Medium risk, medium cost</p> <p>Level of risk is dependent on the individual building and location and, the type of PV tile proposed</p>	<p>Potential harm resulting from fabric loss and disturbance, external visual impact, implications for structural integrity and associated works necessary.</p>	<p>A sensitively designed scheme to minimise fabric and visual impacts based on an understanding of significance.</p>	<p>If building is listed, Listed Building Consent would potentially be required.</p> <p>Full planning permission may be required in certain situations e.g. if permitted development rights have been removed.</p>

2.2.2 Other forms of energy generation

Type	Key Considerations	Example images	Risk - Cost	Potential Heritage Impacts	Potential Mitigation	Constraints
Air Source Heat Pump	<ul style="list-style-type: none"> - Air source heat pumps are most effective in buildings with a high level of air tightness. - Care should be taken to locate the external unit of an air source heat pump in a discreet location away from the principal elevation where possible. - Care should be taken when planning pipe runs to avoid damaging historic fabric / features of interest. - Some manufacturers can colour the unit to blend better with their surroundings, - Screening of units to mitigate visual impacts. 		Medium risk to building significance, although dependant on the individual building, nature and extent of the works involved. Medium to high cost, although potential for grants.	<p>Potential harm resulting from fabric disturbance, removal, and external visual impact.</p> <p>Dependent upon the individual building and scope of proposed works.</p>	A sensitively designed and scheme to minimize intervention into key historic fabric. Screening of units / discrete positioning.	<p>If building is listed, Listed Building Consent would be required.</p> <p>Planning permission may be required.</p>
Ground Source Heat Pump	<ul style="list-style-type: none"> - Potential impact on archaeology which could be affected by the required ground works and disturbance – prior to works commencing an archaeological assessment may need to be undertaken by a suitably qualified and experienced professional. - The impact on historic fabric and features resulting from the need for new pipework distribution needs to be carefully considered. - Heat pumps work most efficiently with large surface emitters. This is commonly associated with underfloor heating. Prior to installation of any form of heat pump, heat loss calculations and assessments of the current heat emitters should be performed, in order to fully assess whether additional heat emitters will be required. 		Medium risk to building significance, although dependant on the individual building, nature and extent of the works involved. Costs could be medium-high	<p>Potential harm resulting from fabric disturbance including below ground archaeology dependent upon the individual building and scope of proposed works.</p>	A sensitively designed and well- planned scheme to minimize intervention into key historic fabric and visual impacts based on an understanding of significance.	<p>If building is listed, Listed Building Consent would be required.</p> <p>Planning permission may be required.</p>
Wind Turbines	<ul style="list-style-type: none"> - Due to their potential prominence and visual impact, proposals for wind turbines in historic settings and landscapes will need to be carefully considered in terms of their impact on the setting of heritage assets. - The impact on the setting of Durham Castle and Cathedral World Heritage Site must be considered where relevant. - Turbines should be located discretely where possible to mitigate impact on the setting of heritage assets. 		High risk, high cost Level of risk is dependent on the and location and, the type of proposal	<p>Potential harm resulting from impact upon significance, and most notably, setting. Potential archaeological implications, impact on historic building fabric</p>	A sensitively designed and well- planned scheme to minimise intervention into key historic fabric and visual impacts based on an understanding of significance.	<p>If building is listed, Listed Building Consent would be required.</p> <p>Planning permission may be required.</p>

Type	Key Considerations	Example images	Risk - Cost	Potential Heritage Impacts	Potential Mitigation	Constraints
Biomass	<ul style="list-style-type: none"> - Impact on historic fabric and features needs to be carefully considered. - Where practical, consider putting the exhaust through a vertical flue in a roof that cannot be seen. - Discrete positioning is key with flues/extracts, e.g. secondary elevations/rear roof slopes. - Flues should typically have a black powder-coated finish to limit prominence. - Plumbing routes should avoid notching floor joists and should be installed parallel to them to avoid harm to historic fabric and possible structural problems. - If possible, remove redundant services when no longer required. - Care should be taken when planning new pipe runs to avoid damaging historic surfaces and decorations (e.g., when lifting and re-laying floorboards). - Where a new outbuilding is required, care should be taken regarding location and design. 		<p>Could be medium - high dependant on the individual building, nature and extent of the works involved.</p>	<p>Potential harm resulting from fabric disturbance, loss and visual impacts.</p> <p>Dependent upon the individual building and scope of proposed works.</p>	<p>A sensitively designed and well- planned scheme to minimize intervention into key historic fabric and visual impacts based on an understanding of significance.</p>	<p>If building is listed, Listed Building Consent would be required.</p> <p>Planning permission may be required.</p> <p>Consideration of environmental factors such as air quality.</p>
Electric Vehicle Charging Points	<ul style="list-style-type: none"> - Vehicle charging points can be small features which can be discretely positioned within the curtilage of historic properties. - Ideally attach to secondary elevations / discrete positions rather than the front elevation - Affix through mortar joints rather than historic stone or brickwork - Consider whether they can be affixed to less sensitive walling, e.g. a modern boundary wall/extension - Free standing points would not require invasive work into historic fabric 		<p>Low risk, low cost</p>	<p>Avoid attaching prominently to the front elevation of historic buildings and excessive invasive work into historic walling</p>	<p>A discrete position would hide such a feature, whilst attaching to a modern extension/boundary would negate the need to impact on historic fabric.</p>	<p>If building is listed, Listed building consent may be required if attached to the host building.</p>

Section 3 Additional Information / Links

3.1 Guidance on Energy Efficiency and energy generation in historic buildings

Historic England – How to Improve Energy Efficiency

Guidance produced by Historic England on how to improve the energy efficiency of historic buildings

Historic England – Retrofit and Energy Efficiency in Historic Buildings

Free to download publications produced by Historic England which include technical advice and guidance on retrofitting historic buildings to improve their energy efficiency.

Historic England - Traditional Windows: their care, repair and upgrading

Detailed technical advice produced by Historic England on the maintenance, repair and thermal upgrading of traditional windows, as well as on their restoration. The guidance also sets out our general approach when alteration or replacement requires listed building consent.

Historic England – Energy Efficiency and Historic Buildings: Solar Electric (Photovoltaics)

Guidance by Historic England which covers the issues associated with installing solar photovoltaic (PV) panels on a historic building or on the land of a historic site. It describes the different options available and how they work. Advice is also provided on how to minimise the potential damage to the fabric and the visual impact of a renewable installation on the character and appearance of the building or site.

Energy efficiency in old buildings

Information produced by the Society for the Protection of Ancient Buildings

3.2 Policy and Planning Links

National Planning Policy Framework

County Durham Plan (2020)

County Durham Neighbourhood Plans

Durham County Council Pre-Application Advice

Historic England – Listed Buildings

Conservation Areas in County Durham

Building Regulations: Conservation of fuel and power: Approved Document L

Wind Turbine Evidence Paper for the County Durham Plan

Climate Emergency Response Plan for Durham