Climate change and the built environment

Risk analysis, resilience, and adaptation

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Contents

Welcome to our guide to some of the key property insurance related risks facing us from climate change, and the trends that we're seeing develop. Climate change presents a vast array of challenges to the built environment. For those responsible for, and using buildings, there are a number of far-reaching aspects to consider: from assessing the overall energy usage of a building to measuring the carbon footprint and planning capital works in the move towards net zero. Add to this funding and procurement challenges, and the list of considerations can be extensive and, in some cases, overwhelming.

Our Planet, Our Part

It's our planet to protect, and we all have a part to play.

At Ecclesiastical we are coming together behind a Group initiative we call 'Our Planet, Our Part'. We're committed to taking responsibility and doing more to help tackle climate change. It means bringing people together and using our resources to work and live more sustainably. But it also means helping and informing our customers, so that we can all be more aware, take practical steps and be more effective in playing our part.

Section one

Climate change is having an impact right now

We mustn't overlook the impact climate change is having on our built environment today, when considering the future risk landscape. It's important to balance the focus between future changes and adaptations, and how we manage and mitigate the risks facing our buildings currently, as well as future exposures.

Top 3 risks from climate change over the long term

1

Failure to mitigate climate change

2

Failure of climate change adaptation measures

3

Natural disasters and extreme weather events

What about from an operational property risk perspective?

Some of the key risk drivers include:

- Changes in precipitation – typically higher winter rainfall and lower summer rainfall, resulting in:
  - Increased frequency and severity of river flooding events
  - Increased flash flooding from extreme levels of precipitation in a location over a brief period, particularly in urban areas
  - Increased risk of drought and changes in soil moisture (leading to greater subsidence).
- Increased sea levels and heavier storms, resulting in increased losses from coastal flooding and damage, but also increased surface water flooding.
- More periods of extreme heat leading to greater use of air-conditioning in commercial environments and consequent escape of water losses.
- More periods of extreme heat or freezing conditions, leading to reduced productivity and increased cost of repairs to damaged buildings.
- Greater prevalence of events that have not been common in the past, e.g. wildfire.

Potential changes and mitigation strategies can consist of a variety of components. These include carbon efficiency, energy efficiency of building services, and service demand (with the latter being influenced by behavioural, operational and lifestyle adaptations).

While new build projects offer the opportunity for contemporary energy performance standards and climate impact mitigations, the existing built environment faces some very real challenges around adaptation and improvement in respect of energy performance.

Helping you understand the potential impact on your property

Risk identification framework

To help you understand the potential impact on your property, whether that's your home or business premises, there are simple steps to managing risk: looking at potential likelihood, effects and impact from a climate change perspective; together with mitigations and monitoring measures to maintain a focus on potential exposures and vulnerabilities.

5 Risk Management Steps

1 Risk identification

- Think about your priorities and plans, and identify any possible barriers.
- Review any near-miss events or issues.
- Consider and assess the impact of any existing trends, including any information from similar properties, locations or organisations.
- Identify any new initiatives or regulatory requirements.

2 Risk analysis

Capture the 3 main elements to a risk.

Background	Cause	Consequences
General background	What could trigger the event?	What could the consequences be?
What? Where? How?	How? Why? When?	How big? How bad? How much?

3 Risk prioritisation

- How big an impact will the risk have on your property or organisation?
- How likely is the risk to occur?

4 Risk mitigation

- Assess current actions and controls already in place
- Consider additional controls or actions to further reduce the likelihood of the risk occurring or minimise the impact should it happen. 'The 5 Ts' can help with this:

  Terminate the activity generating the risk

  Treat the risk through mitigation measures

  Transfer the risk through insurance or third party

  Tolerate the risk as within risk appetite or out of your control

  Take the opportunity (the upside of risk)

5 Risk monitoring

- Ensure you reconsider and review risks on an ongoing basis.
- The frequency and formality of those reviews should reflect the nature of the risk.
- Revise any mitigation measures as appropriate following regular reviews.

Section two

Maintaining your property as environmental conditions change

Improving climate resilience

Extreme events are often due to unusually severe weather or climatic conditions, where there's a significant impact on communities, environments and individuals. The frequency and severity of these weather events continue to impact in a variety of ways; and, importantly, are a simple indicator of the speed at which climate change is having a major effect.

It's about today, not just future considerations.

What can you do to maintain your property to resist changing environmental conditions?

Key weather events to consider

The resilience of your built environment concerns both the current climate conditions and potential ones. This table below highlights some key considerations.

Severe storms

Wind and rain often - combined and with little advance notice resulting in material damage to buildings and property with impact damage and damage to services being common losses

Increased rainfall

Flash flooding with surface water flooding causing damage to properties. Increased pressure on watercourses and drainage systems to cope with high volumes of water

Sustained rainfall

Saturated ground resulting from extended periods of wet weather can lead to increased ground water levels and surface water flooding.

Reduced ability for ground to absorb continued levels of rainfall, placing pressure on drainage systems and watercourses.

Possible ground heave leading to structural movement and cracking.

Extreme winds

Loose and unsecured debris can potentially impact buildings. Falling trees and/or branches can cause structural damage to buildings and potential risk of injury.

Roof damage such as broken slates/tiles and general roof coverings can lead to water damage to fabric of building and contents. Other structural damage to the fabric of the building because of wind forces exerted on building elements.

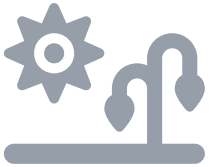
Fallen or damaged trees in proximity to buildings causing significant impact and structural damage

Temperature extremes

Overheating, freeze/thaw conditions with potential to cause burst pipes and subsequent escape of water losses.

Possible ground movement leading to structural movement and cracking.

Increased risk of wildfires to surrounding land, with buildings exposed to fire risk, especially those located in more rural settings.



Drought conditions

Ground movement – subsidence as ground dries out, damaged drainage may cause foundation failure.

Wildfire potential that could impact buildings. Potential structural damage over time caused by subsidence.

Taking steps to build resilience and minimise disruption

Climate change brings about threats that may not have needed a great deal of consideration until now. With any type of risk, considering the potential event, its impact and possible consequences is essential.

Here are some simple steps that could help you identify and implement appropriate controls to minimise disruption:

▼

Identification of potential hazards, both directly and indirectly because of climate change.

▼

Consider who could be harmed or what damage could be caused.

▼

Evaluate and consider mitigation measures.

▼

Plan for and implement the appropriate responses, changes, and controls.

Some measures may be easy adaptations at little cost: amending procedures, draught-proofing or regular gutter cleaning can have a positive impact. Other measures may require future capital investment and recurrent planning.

Energy usage and how to adapt

Often, simple changes can reduce energy consumption. While not applicable or appropriate in all cases, it can be wise to consider how a building is used from an energy perspective.

Reviewing which parts of the building are used, by whom, and for how long, may lead to the rationalisation of areas requiring heating to the necessary occupancy temperatures. In some cases, it may be appropriate or feasible to heat only part of the building to the normal required level, and place minimal background heating in non-occupied areas (of course, with suitable protections maintained to avoid burst pipes in low or freezing temperatures). In a domestic environment, this can often be as simple as fitting thermostatic radiator valves and using them to manage internal temperatures relative to the usage or occupancy levels.

Consideration could also be given to lowering background heating levels by a degree or two to reduce energy usage, while maintaining suitable levels of comfort. These simple adjustments are often perfectly acceptable to occupants.

In more commercial and community-type buildings, it may be possible to rationalise or condense periods of occupation; for example, by aligning or grouping lettings to ensure the building is not being heated in periods between letting unnecessarily.

Simple energy questions to ask

Does the entire building need to be heated?

▼

Can heating be placed on frost settings?

▼

Is it appropriate to reduce background / ambient temperature?

▼

Can occupancy periods be reviewed / condensed?

▼

Can localised and / or short-term heating be used?

▼

Is the heating switched off at the end of occupancy period, or slightly before?

Emerging issues and evolving conditions

Climate change continues to impact the built environment, how we live and how we adapt to these changing conditions and challenges. Some aspects of climate change are predictable; but there are also some irregularities to be aware of.

Examples include hotter summers with drought-like conditions one year, with far less extreme weather characteristics the following year. In contrast, extreme and unprecedented cold spells with freezing conditions could make buildings in more exposed locations susceptible to issues such as burst water pipes or damage to the fabric of the building. Compound effects of repeated storm conditions in an increasingly local geographic area may also be an emerging issue that needs monitoring and consideration.

Soil saturation can occur during periods of prolonged rainfall, and can lead to increased susceptibility to surface water flooding, where the ground may be less able to absorb heavy or persistent rainfall.

This can often be seen by expanses of standing water in fields and low-lying land; and also where surface water enters buildings, as it's unable to drain into the soil in a conventional manner. There may be the potential for impacting subsidence where soils susceptible to movement are subjected to continued saturation; with the potential risk of subsidence for vulnerable buildings. Similarly, there is potential impact on tree roots, where trees could become unstable, or their growing characteristics change as a result of soil being waterlogged.

Innovation is key not only to understanding and quantifying the impact of climate change, but also the continued need to reduce the rate and impact of climate change, and improve resilience through physical and operational changes. This can range from new heating technologies, to the development of more resilient materials to insulate buildings.

Hotter summers with drought-like conditions

Extreme cold spells with freezing conditions

Repeated storm conditions in an increasingly local geographic area

Soil saturation from periods of prolonged rainfall

What is ‘fabric first’?

A robust and structured approach to making climate adaptations to buildings.

Measures taken for climate adaptation are often linked to energy performance enhancements; but they may also relate to measures to resist wider climate risks than energy performance alone.

The principle behind fabric first is prioritising works such as repairs to the building, draught-proofing and ventilation approaches; in advance of more significant upgrades or additions, such as new boilers, heat pumps or photovoltaic panel installations.

Straightforward changes can also fall under the retrofit definition, with measures such as the installation of LED light bulbs or draught-proofing to windows and doors; or the addition of thermal insulation within a roof space. Changes like these help to reduce the carbon footprint of a building.

Many retrofit adaptations or changes can be achieved with relative ease in many property types; but there does remain the need to consider the heritage and conservation aspects where traditional or listed buildings are involved (and similarly those within conservation areas or having special historic interest). Appropriate permissions and consents must also be looked into with the relevant authorities to ensure regulatory and legislative compliance.

Key considerations at-a-glance

- **Consider current building's energy performance**
- **Assess construction type**
- **Review nature of usage**
- **Lifecycle requirements**
- **Whole building approach**
- **Capital costs**
- **Maintenance approach**
- **Thermal performance**
- **Energy usage/performance improvements**
- **Fire performance of materials /systems**
- **Flood resilience of materials**
- **Risk of additional heat / ignition sources**
- **Incorrect specification can result in damage to the fabric of the building**

What do we mean by the terms ‘climate adaptation’ and a ‘retrofit’ approach?

Both terms effectively reflect the upgrading of, or installation of new products, materials, or systems in the shift towards adapting existing buildings from an energy performance perspective.

While many of the changes within the built environment may be readily achievable in new or more recently constructed buildings; when we consider the existing building stock across the UK and beyond, the concept of retrofit is very much critical to adapting our buildings to perform more positively in response to climate change.

Retrofit, however, can be a vastly complex arena, particularly when considering heritage buildings where either or both the building fabric, or its aesthetic status where a property may be listed or located within a conservation area, limit the potential options in terms of any climate related changes and adaptations.

An integrated approach is recommended to ensure that improvements in one area, or aspect, will not have a detrimental effect elsewhere. Assessing thermal inefficiencies in advance of looking at the options to upgrade thermal insulation is just one of the points to consider, when looking at not only the benefits of the energy efficiency measures, but also any associated risks.

Examples

- The introduction of thermal insulation materials should consider the fire performance and combustibility; but also issues such as the breathability, to ensure that the fabric of the building is not adversely impacted over time.
- The avoidance of moisture, condensation and mould that could lead to damaging the fabric of the building, and also impact on the health of those occupying or using the building.
- The risk of water ingress and any potential impact of surface water flooding on the energy efficiency measures should be given due attention.

Specialist advice and assessments may be required to determine not only the most appropriate materials, but also their application and method of installation.

Retrofit risks and challenges

There are wide ranging issues to consider when looking at retrofit for your building. We've outlined some of the key considerations relating to potential energy performance improvements, along with the typical benefits and potential risks.

Potential considerations with common Energy Efficiency Measures

Energy Performance Upgrade

Installation of cavity wall insulation

Typical Benefits

- Reduced heat loss
- Reduced energy consumption
- Consistent levels of insulation
- Less susceptibility to internal condensation
- Increased occupancy comfort
- Long term life cycle benefits
- Positive energy performance rating improvement (EPC)

Potential Risk Considerations

- Building may not be of cavity wall construction, therefore not suitable for such insulation types
- May affect breathability of the wall structure
- Possible introduction of dampness and moisture penetration to the structure if not correctly installed
- May create areas of condensation if not installed correctly
- Material choice is key if property may be vulnerable to flooding

Energy Performance Upgrade

External insulation of solid walls

Typical Benefits

- Reduced heat loss
- Reduced energy consumption
- Consistent levels of insulation
- Less susceptibility to internal condensation
- Increased occupancy comfort
- Improved aesthetics to some property types
- No impact of internal floor space
- Reduced likelihood of thermal bridging

Potential Issues / Risks

- Possible moisture trap if insulation / render / cladding is not vapour permeable
- Potential for combustible external skin to be created (depending on insulation / cladding materials)
- Potential for accidental impact damage if lightweight system is used, that could expose combustible insulation material

Energy Performance Upgrade	Typical Benefits	Potential Issues / Risks
 **Internal insulation of external walls**	▶ Reduced heat loss ▶ Reduced energy consumption ▶ Consistent levels of insulation ▶ Less susceptibility to internal condensation ▶ Increased occupancy comfort	▶ Could create hygrothermal issues affecting overall performance of the building envelope ▶ Possible introduction of combustible internal linings, increasing fire loads ▶ Need to reposition building services and electrical sockets to avoid potential ignition sources within wall structure ▶ Reduction in floor space / areas and impact on internal finishes ▶ Insulation material may not be breathable and could negatively impact on the fabric of the building over time
 **Secondary / Double / Triple glazing**	▶ Reduced heat loss ▶ Reduced energy consumption ▶ Reduced internal condensation ▶ Increased occupancy comfort ▶ Fewer internal draughts ▶ Potential acoustic benefits	▶ May not be appropriate or possible depending upon type of window – size, location, frame detail ▶ Inappropriate owing to heritage / listed / aesthetic considerations

Energy Performance Upgrade	Typical Benefits	Potential Issues / Risks
 **Draught-proofing windows / doors**	▶ Reduced heat loss ▶ Reduced energy consumption ▶ Increased occupancy comfort ▶ Fewer internal draughts ▶ Maintains aesthetics of traditional doors and windows, particularly appropriate to heritage properties ▶ Low-cost improvement ▶ Potential acoustic benefits	▶ May not be appropriate or possible depending upon type of window – size, location, frame detail ▶ Ventilation could be compromised if not correctly detailed / specified
 **Air Source Heat Pumps**	▶ Sustainable heating energy source ▶ No emissions ▶ Reduced running costs ▶ No need for fuel storage ▶ Clean energy ▶ Efficient and adaptable installations	▶ Possible incompatibility with existing radiators/ heating system ▶ May require planning permission / listed building consent ▶ May not be suitable for property type / suitable location ▶ Externally located – potential vulnerability to weather extremes, malicious damage, and theft potential ▶ Consider appropriate protections where these risks are identified

Energy Performance Upgrade	Typical Benefits	Potential Issues / Risks
Ground Source Heat Pumps	▸ Reduced carbon emissions ▸ Sustainable heating energy source ▸ Reduced running / energy costs ▸ Unobtrusive installations ▸ Clean energy	▸ Typically require external space/ownership for installation ▸ Potential high initial installation costs ▸ May not be suitable for property type / suitable location ▸ Disruption during installation
Solar Photovoltaic (PV) Panels	▸ Renewable energy source ▸ Reduced running / energy costs ▸ Clean energy ▸ Reduced carbon emissions ▸ Potential for energy storage system ▸ Easily installed – depending on site specific circumstances	▸ Weather dependency may lead to reduced performance ▸ Aesthetics may limit location of solar panels, particularly on some heritage buildings ▸ Potential fire risk if not installed and maintained correctly ▸ May not be compatible with some roof systems / coverings

Energy Performance Upgrade	Typical Benefits	Potential Issues / Risks
Biomass Boilers	▸ Renewable energy source ▸ Reduced carbon emissions ▸ Efficient heating provision	▸ May require additional heating provision – larger radiators/underfloor heating ▸ High upfront costs ▸ Requires adequate space / location, including fuel storage ▸ Requires robust maintenance to ensure performance and safety
Battery Energy Storage Systems	▸ Enables greater use of renewable energy ▸ Clean energy ▸ Provides power and energy backup ▸ Increased energy resilience ▸ Reduced running / energy costs	▸ Battery storage arrangements may require special provision or suitable protection measures and location considerations ▸ Potential risk of thermal runaway requires consideration when incorporating battery storage ▸ Robust maintenance regimes (inc. access arrangements) are required ▸ Potential fire hazards and risk of thermal runaway. Suitable fire protection measures, such as: siting, enclosure, detection and venting are essential considerations

Expanding on points in the table

As an example from a risk perspective, thermal insulation should not add to the combustibility of a building, so choices of materials require careful consideration.

- Fire performance classifications should be assessed when selecting or specifying insulation products.
- The breathability of the insulation must be considered to ensure that moisture does not become trapped which may lead to future damage to the building fabric, and potentially cause health risks to occupants.
- Mould, and both wet and dry rot can occur where moisture and ventilation are inadequately controlled.
- Roof insulation is traditionally installed at ceiling level in many buildings.

So while it can be a cost effective, easily installed and a thermally efficient retrofit measure, it is important to ensure that any water pipes or wet services located above the insulation level, and therefore within the 'cold part' of the roof structure, are not exposed to freezing conditions. These aspects can often be overlooked and result in burst pipes during freezing weather; and subsequent escape of water losses and damage to the building and / or contents.

Simple thermal lagging of pipes, or rerouting pipework can reduce exposure to such losses.

In contrast to thermal roof insulation being installed at ceiling level, it may be that insulation is to be installed at roof level, where it follows the line of the roof slopes.

Similar considerations apply regarding the fire performance and characteristics, and there remains the need to consider how such linings may reduce ventilation to the roof structure, particularly where the roof frame is timber.

- Sprayed polyurethane insulation products have been used to reduce heat loss and improve thermal efficiency, though are often highly combustible, may not allow the roof structure to breathe and can potentially result in damage to the fabric of the building.
- It is essential that the broader risks are considered in conjunction with the claimed benefits.
- External wall insulation is a further common energy performance retrofit improvement, with the potential to significantly reduce heat loss through external walls.
- Where external walls are of traditional cavity construction, with two leaves of masonry and an air space between, the provision of cavity wall insulation can be relatively easily achieved by means of injection or blowing insulation within the wall.
- Care should be exercised regarding the types of materials used; again to ensure that they do not create potential for moisture to be trapped within the structure, or to avoid any cold spots where condensation could occur.
- Where external walls are not of cavity construction, the options for insulating the walls differ and are typically either externally applied insulation systems, or internal insulated linings.
- Correct specification is essential to ensure the chosen system or product is suitable for the particular application; the breathability, thermal performance, fire performance and resilience are all factors that must be considered.

Weighing up your options

This type of approach, as outlined in the table below, can also be expanded to record such information as potential costs, timeframes and ease of install; and also support a cost benefit analysis and prioritisation.

ISSUE	POTENTIAL SOLUTION	BENEFITS	POTENTIAL ISSUES / RISKS	POSSIBLE MITIGATIONS
Excessive heating bills owing to thermally inefficient building	Install loft insulation to pitched roof	Reduced heat loss and avoid heat rising to unoccupied parts of building	Insulating at roof pitch level may require use of combustible type of insulation board and result in large void still being heated	Install lowered suspended ceiling in areas where building / aesthetics allow Use non-combustible insulation, i.e., mineral wool type Ensure that any wet services that run at a higher level are also insulated to avoid potential freezing within unheated space
	Insulate solid external walls where possible	Reduce heat loss through fabric of the building Reduce surface condensation on cold wall surfaces Overall: - Reduced heating bills - Improved levels of comfort - Reduction in energy consumption	Unable to install cavity wall insulation as external walls are solid masonry Any external wall insulation could increase the risk of external fire spread owing to use of combustible insulation Internally applied insulation to external walls could lead to potential dampness within the fabric of the building if non-breathable materials are used Internally applied insulation systems should not add to the combustibility of the building Challenges in detailing around building features and services including electrical sockets, decorative cornicing etc Potential thermal bridging if incorrect detailing used	

Beyond the building

It’s important to think about the land and areas surrounding your building; and the impact any climate related improvements could have.

Flood risk and assessment

A detailed flood assessment may be required in locations where there is a known or potential flood risk. This assessment would consider not only the possible scale of any flood event, but also identify vulnerabilities to your property, and ultimately identify a range of control measures for consideration and implementation.

With the increase in weather extremes, the frequency, extent, and potential impact of surface water flooding may be increasing. Premises that have not previously been at risk of surface water flooding may suddenly experience a flood event. This risk may be increased when combined with other factors, such as poorly maintained or ageing drainage systems. Drainage systems can be placed under additional stress in these conditions, meaning they may be unable to cope with the sudden increased volumes of water. Such weather conditions also mean that, along with large volumes of surface water, come associated debris and vegetation that can further compromise the capacity and effectiveness of drainage systems.

Check the flood risk in your area

- England
- Wales
- Scotland
- Northern Ireland

Drainage provision

The condition of below ground drainage systems can be hard to establish; but quick checks can be made to assess the condition of drainage provision:

- Look for blocked gullies – covered with leaves, vegetation, or other debris.
- Look for evidence of ponding, where rainwater tends to accumulate even after modest rainfall.
- Check for areas of sunken ground, where there may be depressions on the surface that suggest collapsed drains beneath.
- Monitor any wet and spongy ground conditions in a particular area, which could suggest inadequate or ineffective drainage.
- Where appropriate, liaise with neighbouring property owners to see if they have similar issues, or may be subject to similar risks.

Tree management

Along with the potential flood risks associated with changing climatic conditions, storm events can also introduce new or increase existing risks to your premises and people. Storm conditions and high winds can present the risks of fallen trees and the carrying of loose debris, with the potential to cause harm and damage.

Assessing the condition of trees in areas of increased vulnerability should form part of your routine maintenance arrangements, and incorporate issues as age, condition, location, and species. Advice should be sought from a suitably qualified specialist to assess the risks and identify appropriate control measures.

Linking the subject of trees to flood risk, there may also be the need to consider the potential effect of root damage to underground drainage systems, with the risk of root damage causing the failure of drainage provision. In extreme cases, such damage can result in structural damage to a property.

Wildfire

Wildfire is a rare occurrence, though there are locations that could be more exposed to risk than is initially realised. Looking at the nature of the land surrounding your property, its use, the type of vegetation and proximity to combustible structures are all points to consider. Wildfire is commonly associated with dry, moorland-type conditions in more rural areas; but in periods of hot, dry weather, the risk can extend to grassland, parkland and similar environments.

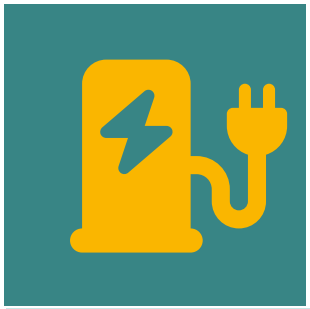
Consideration of this risk can be as simple as looking at neighbouring land and considering if a fire could spread to your property and potentially cause damage. Remember that the use of the land is a factor: for example, is it open parkland where the public may have barbecues in summer months, or where cigarettes may be readily discarded into dry vegetation? Equally, are there large quantities of potentially dry vegetation that could assist in spreading fire if accidentally ignited?

The presence of EV charging

The siting of electric vehicle charging devices and locations of electric vehicles relative to your building could introduce a significant risk in the event of a fire. The benefits associated with electric vehicles are well known, and their increased presence is a key part of the route to net zero.

There are, however, increasing concerns regarding the behaviour of lithium-ion batteries contained within vehicles when subject to fire. Fire & Rescue Services can face significant challenges when attempting to extinguish fires involving lithium-ion batteries. Overheating of battery cells results in a chemical reaction, which leads to varying fire behaviour conditions and what is known as thermal runaway. The differing nature of these fires requires alternative fire-fighting approaches, and can present significant challenges and delays in being extinguished (and will always require intervention from Fire & Rescue Services).

To mitigate potential impact in the event of a fire, the siting of charging devices and location of electric vehicles in proximity to your building should be considered appropriately and risk assessed.



Assessment should include

▼

Distance from the building (including location within the building if sited internally)

▼

The construction and combustibility of the building and adjacent structures

▼

Fire-fighting access

▼

Number of vehicles and space separation distances

▼

Location of other combustibles around the premises

Read our vehicle battery charging guidance

Embracing innovation also means considering risk

In the drive towards carbon net zero, great amounts of innovation are behind the development of new products, equipment, and approaches. As with any innovation, along with a vast array of benefits comes some risks. From a property protection perspective, you should take a basic approach to assessing any potential risks.

Simple considerations

- **What is the key driver for the provision / change / measure?**
  - What could go wrong?
  - System failure
  - Component failure
  - User error
- **What could the consequences be?**
  - Potential leak / burst pipe
  - Introduction of ignition source
  - Heat build-up – resulting in fire
  - Increased fire spread potential
- **What damage could occur?**
  - Localised – component failure
  - Mechanical damage
  - Damage beyond component / system / product
  - Loss to the fabric of the building – partial / total
- **Who could be harmed?**
  - Residents
  - Staff
  - Volunteers
  - Public
- **What testing has been carried out?**
  - Proven technology
  - Appropriate test standards – relative to circumstance
  - 3rd party accreditation

Section three

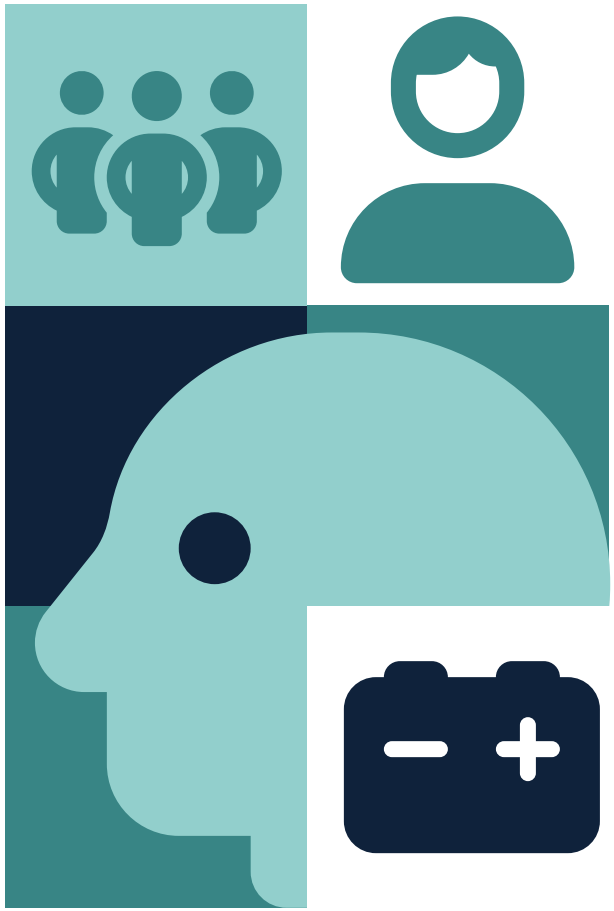
Taking steps on the road to carbon net zero

Here we cover some of the actions and adaptations that can be carried out to your building in the journey towards carbon net zero.

From draught-proofing a poorly fitting external door to installing thermostatic valves on radiators, fairly simple things can make positive changes to your energy consumption and your bills – and reduce the impact heating your building has on the environment. More significant capital works, such as the installation of solar panels on the roof of your building, can help you take great strides on the way to net zero.

The right people for the job

- Contractors should have the appropriate experience and competence to complete the works.
- Contractors should be checked in terms of their qualification and accreditation and, where possible, be part of a third-party accreditation scheme.



When installing a new system or product, it's important to think long term.

Considering lifespan

It's advisable to consider the likely lifespan of a new product or system at the procurement stage; taking into account the associated costs of not only replacements, but for the disposal of redundant components. Similarly, take into account the lifecycle and ongoing maintenance requirements when choosing retrofit improvements to ensure that maintenance requirements (including frequency and costs) are understood at the outset, and can be accommodated. In many cases, all this may form part of the statutory compliance checks.

Replacement components

Availability of replacement components should also be discussed with suppliers or installers to establish that, in the event of a component failure, replacements will be readily available (or that repairs are unlikely to have significant delays). For commercial premises, a relatively simple mechanical component failure could lead to a costly business interruption event; or, in the case of a residential property, be a significant inconvenience or discomfort to occupants.

Lithium-ion batteries

When looking at changes to your building that involve the provision of lithium-ion battery systems, you need to consider suitable separation from combustibles, plus the risk and impact of thermal runaway in the event of a fire.

Quick considerations checklist

▼

Will the product / system fulfil requirements?

▼

Is it suitable for the chosen environment?

▼

Is it tested for use in a particular circumstance?

▼

Do contractors have appropriate experience, competence and third party accreditation?

▼

Have maintenance requirements, frequency and costs been considered?

▼

What is the design lifespan for the product / system?

Retrofit options that can support your journey to net zero

Common retrofit improvements

- Draught-proofing existing window frames and door frames
- Installation of secondary, double or triple glazing to reduce heat loss
- Installation of thermally efficient external doors
- Installation of LED light bulbs – a simple and cost-effective improvement
- Provision of thermostatic radiator valves
- Smart meters to actively monitor energy usage
- Energy-efficient white goods and electrical equipment
- Upgraded or additional thermal insulation within roof spaces
- Lagging of heating and hot water pipes
- Installation of PV / solar panels

Less common retrofit approaches

- Infrared panel heating
- Installation of heat pumps – ground source or air source
- Battery storage linked to PV installations
- Wind turbines

Commonly overlooked issues

- Lagging of pipes 'above insulation levels' in roof voids – reducing potential for frozen or burst pipes
- Ensuring ventilation requirements are appropriate
- Turning off heating for financial savings without appropriate frost protections can lead to frozen/burst pipes
- Isolation of PV panels – appropriately located and identifiable
- Ensure PVs are not installed on a roof that is likely to have a short lifespan - consider condition of building
- Access for maintenance requirements throughout the life cycle of building / component
- Subsidence / ground heave – because of changing ground conditions and water tables

Risk advice line
- a helpline for Ecclesiastical customers

Ask our experts your questions about how to manage risks better, contact the team:

0345 600 7531

Lines are open 9am – 5pm Monday to Friday (excluding bank holidays)

risk.advice@ecclesiastical.com

Learn more about the risk advice line