

Heritage responds -  
**Taking positive action  
on climate change**



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# Foreword

## An extraordinary challenge – heritage and climate change

**T**he Historic Environment Forum exists to bring people together. And there is no other single issue that requires us to work more closely together than climate change.

As the world turns its eyes to COP26 in Glasgow, this paper is intended to highlight the positive contribution heritage organisations and their partners are making to the debate and the actions needed to adapt to a changing world.

What is clearly evident is the extraordinary level of thought, innovation and commitment already being put towards tackling the climate crisis. All of the case studies in this paper are available on-line on the HEF [Heritage Responds Climate Change Story Map](#), a fantastic repository of good practice, lessons learned and interaction between different groups and sectors anyone can draw on. I'm grateful to all the organisations who have provided us with such a rich and diverse selection of material.

As a sector, we must communicate. If there's one thing heritage people are good at, it's weaving a tale. We can't let our good work go unnoticed. So, let's draw on our flare as storytellers, draw on our knowledge of the past – how people lived with and responded to climate change in the past, and what it might mean for the future. Let's tell people about the challenges we face and the solutions we've found. Let's make the case to our supporters and show the difference heritage can make in tackling the monumental challenge of climate change.

**Heritage is part of the solution.**

Adrian Olivier  
*Chair of the Historic Environment Forum*



# Climate change and heritage

Our heritage now faces unprecedented challenges from climate change; heritage can be part of the solution

Climate change is one of the biggest threats facing the historic environment, and the heritage sector is united in our response to this extraordinary challenge. As heritage organisations, we recognise the unique opportunity presented by COP26, the United Nations Conference of the Parties on Climate Change, to address this issue in line with efforts to 'unite the world to tackle climate change'. The 2021 International Panel on Climate Change (IPCC) report has made the situation painfully clear – the situation is worsening, and we must act now.

The heritage sector is acutely aware of the potential impacts of climate change on the places we value. We know an increasing amount about the potentially damaging impacts that higher sea levels, increased flooding, storm damages, droughts and temperature have on historic buildings and landscapes, archaeological sites, on our marine heritage, gardens and parklands. We know the impact this will have on people's homes and property, on towns facing increased flooding, on coastal and rural communities.



**Heritage matters** – people love it, respond to it, debate it. The historic environment is all around us, in landscapes, in buildings and in communities. Heritage forms the backdrop of our everyday lives in cities, towns and countryside across the nation. Thousands of jobs in tourism, hospitality, consultancy and construction depend on it. Millions of people visit heritage sites every year, generating billions in tourism revenue for the economy. Regenerating urban areas brings further investment and pride in town centres. Historic buildings, gardens and landscapes are habitats for protected species and act as the green lungs for our towns and cities.

Heritage cannot however be defined by buildings, landscapes and places alone; it's about the knowledge and insight heritage offers into how people lived in the past and shaped the world around them. This knowledge, and an appreciation of how it has shaped our social and cultural values, help us to make the right choices as we face today's challenges.

**We can make a difference** – the heritage sector is now committed to finding ways of not only protecting and adapting the places people value, but utilising heritage as a means to support society in meeting the challenges of climate change. Far from being a barrier to mitigation and adaptation, the heritage sector can offer solutions.

This document is intended to show how heritage can become part of the solution to the risks and challenges of climate change. Importantly, this isn't just about making statements and promises, but rather sharing what we are already doing, and galvanising further action. The case studies set out in this document speak for themselves and of the talent, ingenuity, and technical endeavour of so many people working across the heritage sector with partners in academia, government and industry, striving to play their part.

Images:

above: Waves batter the harbour walls at Mullion Cove, Cornwall during a February 2014 storm.

*Caitlin DeSilvey/University of Exeter*

left: At Hurst Castle in Hampshire, English Heritage face challenges after coastal erosion caused a collapse in the Victorian east battery. Projected sea level rises make planning for the future more challenging and costly.

*English Heritage*



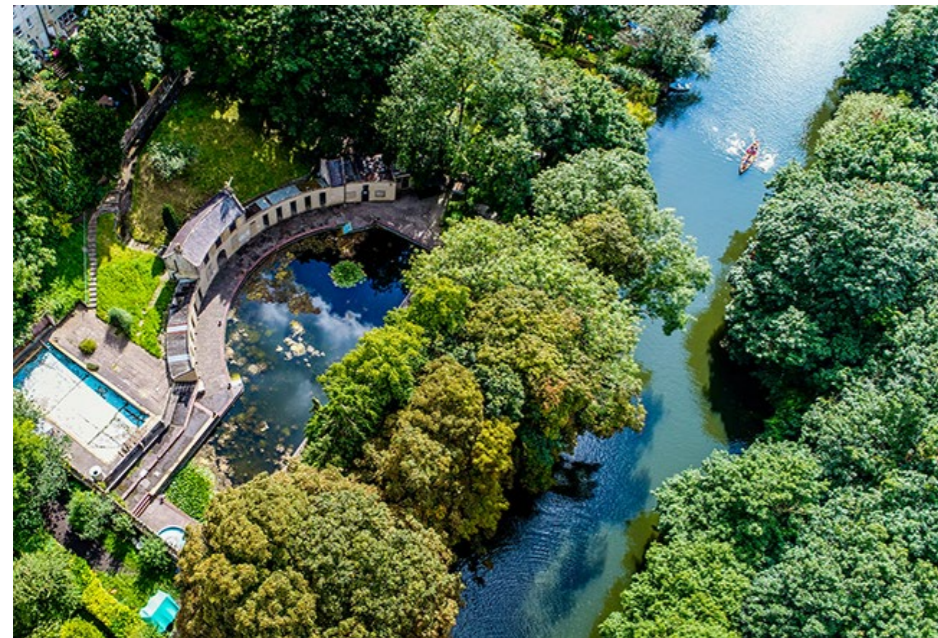


# Making heritage part of the solution

We believe heritage can play an active and positive role in addressing the challenge of climate change

**W**e recognise that if we care about heritage we need to show the value of the contribution we can make to the climate change debate. We also need to demonstrate real action and commitment to changing how we work, decarbonising our sector and supporting others in making informed decisions.

**We believe our role is to help people make informed decisions about climate change.** More than a third of all buildings in the UK date to before 1919. We know that maintaining and adapting historic buildings keeps carbon locked up. Demolishing buildings to make way for new build risks releasing excessive carbon emissions that cannot be off-set, not matter how energy-efficient they might be.



## **Our role is also to offer solutions.**

We've pioneered research into climate change impacts and are innovating new approaches to vulnerability and hazard assessments. We are harnessing digital technology to inform carbon reduction. We are focusing on new training needs and closing the skills gap to support sustainability. And importantly we are working across sectors to develop nature-based solutions to better protect heritage, enhance biodiversity and address the risks of major flooding and sea level rise.

**And we have an audience of millions.** Our understanding of the past and long interaction between people and the nature – evident in the archaeological record, monuments, buildings and landscapes that characterise our world – can bring

insight into how people can adapt to change. We can help people discover their heritage, understand how places have changed and so bring them together to adapt to change.

Our task now is to harness the social, economic, cultural and environmental benefits of heritage to become part of the climate change solution.

To make this happen, the heritage sector must:

- **Commit** – to decarbonise our sector: creating, revisiting and reviving organisational sustainability plans to ensure commitments to Net Zero are backed up with robust and evidence-led delivery plans, and consider sustainability, carbon and environmental impact at the start of every project
- **Collaborate** – Work openly and effectively to share guidance, good practice, practical experience and lessons learned within the sector and beyond
- **Communicate** – Make the case for why heritage matters and actively participate in the climate change debate, showing how people have coped and adapted in the past and how good heritage management can build the resilience of places and communities, reduce emissions and retain embodied carbon.
- **Invest** – in the research, innovation, jobs, training and skills we need to adapt and build resilience in the face of climate change.



Images:

above: Photovoltaic panels on the south-facing slope of Gloucester Cathedral's medieval roof. *St Ann's Gate Architects*

left: Cleveland Pools, showing the lido, associated buildings and adjacent river. *Casey Ryder*



# Taking positive action on heritage and climate change

We are already taking action, but there's much more to do

**O**n behalf of the Historic Environment Forum, the HEF COP 26 Task Group – made up of representatives of Historic England, Historic Buildings and Places, the Institute for Historic Building Conservation, the National Trust, Historic Houses, Church of England, English Heritage, the Institute of Conservation (Icon), the Architectural Heritage Fund, Heritage Alliance, Natural England and the National Lottery Heritage Fund – reviewed our current understanding of heritage related climate change activities.



What we found was just how much activity was already underway within the heritage sector and across its partners, and often in collaboration with other bodies. This activity includes:

- **Pioneering research and innovation** – leading the science on understanding climate impacts, adaptation and risk, and what we can learn from past long-term environmental change and human adaptation
- **Advocacy, awareness raising, sharing best practice** – action, collaboration and change
- **Decarbonising heritage** – creating a low carbon heritage sector
- **Supporting and enabling sustainable communities** – strengthening resilience through adaptation and engagement
- **Championing nature** – finding nature-based solutions to heritage challenges
- **Improving energy efficiency** – making the case for historic buildings
- **Investing in training and skills** – building both new and traditional skills for sustainability

Behind all this work is of course the excellent guidance and advice on sustainability and climate change issued by Historic England, Historic Environment Scotland, Cadw, Society for Protection of Ancient Buildings, Institute for Historic Building Conservation, National Lottery Heritage Fund and the Fit for the Future Network, amongst others.

We hope the case studies included here help illustrate the breadth of current activity, get people talking and inspire further positive action. However, they are by no means comprehensive – we know a lot more activity is ongoing and we hope to keep the tool which supports this document, the [Heritage Responds Climate Change Story Map](#), live with future updates.

Collaboration is the key to taking things forward. We must continue to talk to others and build new partnerships; it's the interaction of ideas and perspectives that will continue to lead to positive action. And just as climate change knows no boundaries, nor should we.

Historic Environment Forum  
October 2021



Images:

above: Bath Abbey's newly restored floor features eco-friendly underfloor heating which uses renewable energy from Bath's famous hot springs.  
*Stephen Girling/Bath Abbey*

left: The Storm Tower, Bude, showing its proximity to the cliff edge.  
*Historic England*



# Pioneering research and innovation

Leading the science on understanding climate impacts, adaptation and risk

The heritage sector has been engaging in research and innovation for the last 20 years, identifying the potential risks and impacts from climate change.

Since the publication of the seminal 'Climate Change and the Historic Environment' report (UCL / Historic England, 2005), climate change study has expanded rapidly, with the academic sector working increasingly with international partners to understand the scale of impacts and change across different heritage assets. Heritage scientists map and analyse climate change, risk and hazard across the UK, from historic coastal landscapes to heritage sites at risk of storm surges, soil movement, flooding and rising sea levels. Understanding how we face into the risk of loss has become an increasingly important research theme.

But crisis brings new solutions, and we are increasingly seeing heritage bodies working with other sectors, including the insurance industry and technology start-ups, to innovate new means of capturing and using data to understand energy and carbon use and to predict risks to buildings, landscapes and collections.

Image::

The Cotehele Weir in high flow shortly after its collapse in 2020  
National Trust/George Holmes



## Case study

### Climate change and the historic environment: research into policy

UCL Institute for Sustainable Heritage

Among the positive actions that the heritage sector is taking to address climate change is the conduct of research to ensure that together we are part of the solution rather than the problem. Since its inception in 2001, the UCL Institute for Sustainable Heritage (ISH) has been at the forefront of collaborative academic research with the aim of informing national and international policy on climate change and the historic environment.

#### Research into policy

- In 2002, English Heritage commissioned ISH to carry out the first scoping study on *Climate Change and Historic Environment*. The research methodology which centred on two stakeholder workshops with site managers and policy makers, identified the significant climate change parameters and their impact on the historic environment. The report published in 2005 is found here: [discovery.ucl.ac.uk/id/eprint/2082/1/2082.pdf](https://discovery.ucl.ac.uk/id/eprint/2082/1/2082.pdf)
- Between 2003-6, ISH led *Engineering Historic Futures*, an EPSRC funded collaborative research project in partnership with heritage, industry and academic partners to investigate hygrothermal stresses caused to saturated historic building fabrics subjected to slow and rapid drying after flooding. Working with heritage organisations to identify key problems in several case study sites, a Stakeholder Dissemination and Scientific Research Report was published in 2007: [discovery.ucl.ac.uk/id/eprint/2612/1/2612.pdf](https://discovery.ucl.ac.uk/id/eprint/2612/1/2612.pdf)

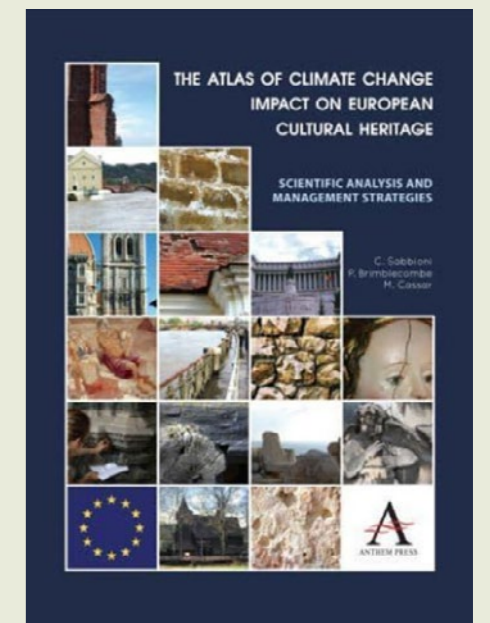
- Between 2004-7, ISH was a key partner in an international consortium investigating *Global Climate Change Impact on Built Heritage and Cultural Landscapes*, known as *Noah's Ark* [cordis.europa.eu/project/id/501837/reporting](http://cordis.europa.eu/project/id/501837/reporting). The main outcome of the research was a Vulnerability Atlas including maps depicting areas with increased or decreased risk for materials' deterioration in different European regions [blackwells.co.uk/bookshop/product/The-Atlas-of-Climate-Change-Impact-on-European-Cultural-Heritage-by-C-Sabbioni-Peter-Brimblecombe-May-Cassar-Noahs-Ark-Project/9781843317982](http://blackwells.co.uk/bookshop/product/The-Atlas-of-Climate-Change-Impact-on-European-Cultural-Heritage-by-C-Sabbioni-Peter-Brimblecombe-May-Cassar-Noahs-Ark-Project/9781843317982) The project won the 2010 Europa Nostra Grand Prize for Research.

These three projects – local, national and international – were the foundations of two major initiatives – national and global – whose impacts are flowing into the second decade of this century and beyond:

For 20 years, ISH has built its policy engagement on its cultural heritage and climate change research.

Most recently this has been enhanced through:

- Membership of the UNESCO-ICOMOS-IPCC Scientific Steering Committee preparing for an International Expert Meeting on Culture, Heritage and Climate Change taking place in December 2021
- Membership of the JPI Cultural Heritage and Global Change Advisory and Scientific Board which together with the JPI Climate is preparing a White Paper on *Cultural Heritage and Climate Change: New Challenges and Perspectives for Research*
- Membership of the Heritage Climate Network and the Bartlett's Together for Climate Action [www.ucl.ac.uk/bartlett/together-climate-action](http://www.ucl.ac.uk/bartlett/together-climate-action) in the lead up to COP26.



- National: Leading the *AHRC/ EPSRC Science and Heritage Programme (2007-2013)* [issuu.com/heritagescience](http://issuu.com/heritagescience), ISH set the intellectual framework for the first programme of heritage science research. Resilience and adaptation was a key theme of the programme identifying the need for research to understand environmental and anthropogenic effects including climate change which was predicted to take its toll on cultural heritage in the 21st century. The gaps in research that were identified for this theme included testing conservation standards, materials tolerance and environmental thresholds in order to maximise the time between cycles of intervention, to make efficient use of natural resources while taking into account changing and different climates.
- Global: The UNESCO World Heritage Committee at its 30th session in July 2006 acknowledged the risks of climate change to World Heritage by endorsing the report *Predicting and Managing the Impacts of Climate Change on World Heritage and the Strategy to assist State Parties to implement Management Responses*. The report was prepared following a meeting of experts in March 2006 to which ISH was invited by DCMS to contribute as expert adviser.



## Case study

# Hazard mapping

National Trust

The National Trust has developed a “game changing” map that illustrates the threat climate change poses to some of its most iconic and culturally significant sites – and offers some solutions on how to tackle it. It is the first map of its kind that plots data in this way and will help the charity identify the hazard level facing its countryside locations, monuments, coastlines and historical sites in England, Wales and Northern Ireland.

### Background

By plotting its places alongside existing data on climate change related events, the Trust can understand how, at a local scale, potential risk factors (extreme heat and humidity, flooding, landslides, coastal erosion, soil heave and high winds) could change by 2060.

The data will be used by the Trust to look at risks to the landscape, with landowners working together to

Working to a worst-case model of no intervention on emissions, the map is intended to be used as a “flagging tool” to highlight potential hazards to the locality of a site.

By identifying areas at risk, the charity can pinpoint locations that may need interventions like tree planting to slow water run-off, peat bog restoration to hold back water, river restoration or areas that need more shade due to extreme heat.

engage local communities to volunteer in their area. The map will also support the Trust’s ambition to plant the right tree in the right place and to establish 20 million trees by 2030.

### What’s next?

The next phase of the project will build on work already undertaken to identify and act in areas in which homes for wildlife are at risk and where species reintroduction may help the environment. It could also see government bodies from England, Wales, Northern Ireland and Scotland plot the heritage locations they care for to illustrate the threat to the whole UK historic environment. Coastal areas at risk of collapse or sand dune movements due to rising sea levels will also be highlighted in the future, which will also enable more informed solutions.

Image:

National Trust/John Miller



## Case study

# Smart sensors in historic buildings - Kenwood House

English Heritage

English Heritage worked with Ecclesiastical and technology firm Shepherd on a pilot for state-of-the-art monitoring sensors at Kenwood in North London. The pilot involved installing self-contained sensors to discreetly monitor the building and environmental factors in real time, allowing us to respond to risks and understand, manage and reduce electricity, gas & water consumption to lower costs and reduce carbon footprint. The pilot predicts this could help reduce operating costs by as much as 25% by driving down energy and maintenance costs and preventing damage.

The system – now being rolled out more widely by Ecclesiastical – is quick and easy to install, so it can be up and running in a matter of weeks.

Due to heavy masonry walls and statutory protections, many historic properties struggle with patchy WiFi and it can be difficult to wire new sensors into to mains. The system addresses this by using a LoRaWAN Gateway, acting as a bridge between the sensors and the Hub and not requiring WiFi. The sensors also use AA batteries, lasting up to three years and removing the need for mains power.

The project was recognised at the CIR Risk Management Awards where it received the ‘highly commended’ award in the Risk Management Innovation of the Year category. Read more about the project here: [www.ecclesiastical.com/media-centre/kenwood-house-technology-pilot](http://www.ecclesiastical.com/media-centre/kenwood-house-technology-pilot).

photo credit:  
English Heritage

### How does it work?

- Sensors are delivered to site and self-installed by clients with support from the central team who provide guidance on where best to place them.
- Once installed, the system gathers data to understand the property, building up a picture of conditions over the first few weeks, after which changes in environment and energy consumption are easily picked up.
- Once the system is fully operational notifications are delivered automatically to up to seven nominated team members via the alert system



# Landscape futures and the challenge of change

University of Exeter

## Landscape Futures and the Challenge of Change: Towards Integrated Cultural/Natural Heritage Decision Making

In dialogue with natural and historic environment practitioners and regulators, the Landscape Futures project has developed a new conceptual and practical framework for proactively and iteratively managing heritage transformations: adaptive release.

The project is equipping the heritage sector with consistency in interpretation of relevant regulation and guidance; confidence in making the decision to manage for change; and capability in devolving decision making to local managers and inspectors.

## Background

Within the heritage sector there is widespread recognition that the accelerating effects of climate change will force a reconsideration of the care of at-risk places and properties. New methods are being developed to identify and measure future threats and hazards: as an outcome of these processes, it will be possible to maintain and protect some at-risk heritage features, but for some assets at the 'too tough to save' end of the spectrum it may be necessary to manage processes of decline and transformation. This will not be easy. Applied strategies for managing this kind of change are currently limited, and heritage policy is not designed to address the situation the sector now finds itself in.

Landscape Futures started in February 2020 and will run until January 2022, supported by funding from the Arts and Humanities Research Council and the UKRI Landscape Decisions Programme. The project is led by Professor Caitlin DeSilvey (University of Exeter), with Professor Rodney Harrison (UCL), Dr Hannah Fluck (Historic England), Professor Rosie Hails and Dr Ingrid Samuel (National Trust) as Co-Investigators, supported by Research Associates Amber Blundell (University of Exeter) and Harald Fredheim (University of York). Practitioners and decision-makers from the National Trust, Historic England, Natural England and other relevant agencies and organisations worked collaboratively with academics over the course of the project.



The project has wide-reaching significance for cultural and natural heritage research, policy-making and practice in the UK and internationally.

By developing a management approach that understands dynamic heritage assets as part of evolving cultural-ecological landscapes – where cultural and natural histories are understood as conjoined and complementary – adaptive release is positioned to make a critical contribution to heritage adaptation and resilience.

The project will disseminate its practical outcomes for the management of asset transformations through a series of targeted publications (including a co-authored paper published in *The Historic Environment: Policy Practice* 'Climate Change and Heritage' special issue and a Historic England research report) and through dissemination events in late 2021 and early 2022.

In a series of workshops, discussion focussed on opportunities and barriers related to integrated, adaptive management of risk and loss, and developed the concept of adaptive release as a potential way forward. Workshop participants praised adaptive release as a “potentially game changing piece of work” that will “help us [the heritage sector] to make better, more effective and more sustainable decisions”. Shared discussion across historic and natural environment professions was particularly valued, as was the involvement of a diversity of roles and responsibilities: “It was helpful to me to have that mix of higher-level strategy and policy-based roles and more ‘on the ground’ delivery roles – felt like some good common ground established as a result.” (workshop participant).

## Next steps

The project has successfully established new connections and hosted conversations amongst a diverse range of stakeholders from across the heritage sector. When the project ends in January 2022, Historic England and the National Trust are hoping to broaden the conversation by convening a UK-wide network to draw in cross-sectoral perspectives and professions. The network will encourage open discussion and debate about ongoing and planned management practices, share learnings and case studies, and develop tools for navigating heritage change proactively, collaboratively and sustainably.

University of Exeter Environment and Sustainability Institute Landscape Futures project page [www.exeter.ac.uk/esi/research/projects/landscape-futures/](http://www.exeter.ac.uk/esi/research/projects/landscape-futures/)

DeSilvey et al. (2021) 'When Loss is More: From Managed Decline to Adaptive Release', *The Historic Environment: Policy & Practice* [doi.org/10.1080/17567505.2021.1957263](https://doi.org/10.1080/17567505.2021.1957263)

Heritage Futures [heritage-futures.org](http://heritage-futures.org)

Image:

University of Exeter



# Advocacy, awareness raising, sharing best practice

Action, collaboration and change

The heritage sector – together with colleagues in aligned areas such as biodiversity, architecture and collections care – has responded to the climate crisis by bringing people together under a number of declarations and manifestos for change. Much of this has been grass roots – led by a ground swell of concern around practitioners wanting to raise awareness and take positive action – as well as larger organisations bringing key people together on a national and international stage. Such networks create vital cross-sector and cross-border links, offering important opportunities to share and collaborate in an impactful way.

Sharing knowledge is central to improving our preparedness, helping us adjust how we care for our heritage and the communities that depend on it. Heritage bodies have been proactive in providing guidance and advice to trusts, property owners and local authorities on climate change and sustainability, and this is increasingly becoming an expectation in funding streams administered by the National Lottery Heritage Fund in the UK and the British Council overseas for the Cultural Protection Fund.



Image:

Sea Change conference participants touring Blackpool's North Pier.  
*World Monuments Fund Britain*

## Case study

### Heritage Declares - Climate & Ecological Emergency

Heritage Declares

Heritage Declares is a non-affiliated group of heritage practitioners who have come together to urge the sector to react more quickly and effectively to the climate and ecological emergency. We are distinct from other sustainability initiatives within the sector in that we are a non-technical, grassroots movement that aims to push the environmental crisis to the top of the heritage agenda. Our work is focused on the Declaration ([heritagedeclares.org](https://heritagedeclares.org)), a manifesto for change that sets out ten overarching principles by which the sector can respond to the present crisis. A group of co-ordinators continue to promote the Declaration and encourage all those in the heritage sector to sign.

Heritage Declares came into existence in the summer of 2019, following the first big wave of Extinction Rebellion protests in London. Believing that heritage can play a vital role in shaping public opinion and action on climate and ecological issues, we sought to establish a platform for grassroots environmental activism within the sector.

To focus these efforts, and taking inspiration from Culture Declares, Architects Declare and other kindred movements, we set about drafting the Declaration: a list of ten principles whereby all those involved in heritage can commit to playing their part in the systemic changes required to avert climate and ecological disaster.

The Declaration asks its signatories to place the present crisis at the heart of their professional practice: whether by actively embracing sensitive retrofit in historic buildings, advocating for the responsible use of embodied resources, mitigating the harms of cultural tourism, working to detoxify the financing of heritage institutions, or simply using the sector's relative prominence and prestige to advocate for environmental justice more broadly.

The full text can be found at [heritagedeclares.org](https://heritagedeclares.org). We encourage all heritage practitioners – whether individuals and organisations – to sign the Declaration, as an expression of their commitment to tackling the greatest challenge facing humanity in our time.



**HERITAGE DECLARES**  
Climate & Ecological Emergency



## Case study

# Cultural Protection Fund

British Council and the UK government's Department for Digital, Culture, Media and Sport (DCMS)

The Cultural Protection Fund is led by British Council in partnership with the UK government's Department for Digital, Culture, Media and Sport (DCMS). It was set up in 2016 to protect at risk heritage due to conflict in the Middle East and North Africa.

In 2020 the CPF piloted a new round with the aim of supporting organisations to prepare cultural heritage for the threat of natural disasters and climate change. The round focussed on preparedness measures to protect cultural heritage against the effects of natural disasters and climate change, specifically in 7 countries across East Africa: Ethiopia, Kenya, Sudan, South Sudan, Rwanda, Tanzania or Uganda.

The fund was launched on 14 May 2020

Applications were assessed against the following criteria:

- Cultural protection focus – the significance and value of the cultural heritage
- Project need – the urgency of the risk, demand (locally and beyond)
- Outcomes – how well the project addresses the fund's outcomes (Heritage, Society & Economy)
- Risk – delivery risks as well as sustainability, reputational, security
- Value for money

In November 2020, five projects were awarded just under £500k in total and they continued until July 2021.



### Preserving endangered photograph and newspaper collections at McMillian Memorial Library

The Book Bunk Trust has digitised over 31,549 newspapers, photographs and other items in the Macmillan Library in Nairobi, and has improved the storage conditions for these items, helping to prevent further degradation of this unique library collection.

They have trained 21 people in how to preserve, protect and digitise archives, created 25 paid internships and 5 casual employment roles and engaged over 150,000 viewers with their online activities.

The project's YouTube video on 'How to protect personal archives from climate change' has had over 62k views.

### Citizen Science Tanzania: A strategy to monitor and mitigate the impacts of climate change on coastal heritage

St Andrew's University, in partnership with the University of Dar Es Salaam has carried out important assessment and digitisation of the Kilwa Kisawini and Bagamoyo coastal heritage sites in Tanzania.

The project also developed a database and an app, that local professionals and communities can use to record the tangible and intangible heritage of the local area and monitor climate effects. The app has generated more than 150 new database entries including records of sites, buildings, objects, stories and landscapes. Valuable training in heritage collection and documentation has been delivered to professionals,

ministry staff and local community volunteers to continue this important work.

The project produced a music video with young musicians and popular Tanzanian artist, Claudia Lubao, to increase awareness of the climate change related threats to heritage, which has had over 3k views.

### Melting Snow and Rivers in Flood

In Uganda, the International National Trusts Organisation (INTO) worked in partnership with the Cross-Cultural Foundation of Uganda to explore and protect the heritage sites, age-old traditions and beliefs of the Alur and Bakonzo communities in Uganda.

The project has carried out physical restoration to prevent further flood damage to sites and has documented culturally significant tangible heritage such as sacred sites and hot springs, as well as the intangible heritage of the local communities. Extensive training on the documentation of cultural heritage has been delivered to local professionals alongside awareness raising activities on the risks posed by climate change to traditional ways of life. An important exchange between the UK heritage site of Fountains Abbey and the Wang Lei site in Uganda took place; sharing best practice on how to handle flooding; a very real and global threat to cultural heritage.

### Tigray Rock Hewn Churches

The Federal Authority for Research and Conservation of Cultural Heritage (ARCCH), in partnership with Mekelle University in Ethiopia, created an inventory of the sacred rock hewn churches of Tigray, as well as touristic guides for the area. Although they were unable to complete the physical assessment and repair of the churches due to the conflict, the project team did extensive desk-based work documenting 28 churches and the artefacts and manuscripts held there.

### Coastal Cultural Heritage of Kenya

ICCROM, in partnership with National Museums Kenya, addressed the threats arising from climate change to some of the most vulnerable heritage sites on the coast of Kenya, through risk assessment, training, conservation and advocacy. The four heritage sites: Jumba la Mtwana National Monument, Siyu Fort on Lamu Island, Shimoni Slave Caves & Cultural Landscape and Kongo Mosque Heritage site, are at the centre of traditional communities and represent an important part of their cultural heritage.

The project has documented approximately 50 objects across the heritage sites and carried out important mitigation work at the Siyu fort to protect against the immediate threat of sea erosion. Risk management plans were developed for all 4 sites and 125 local site managers, caretakers and community members were trained in climate change and disaster risk management. The project has been instrumental in raising awareness and building capacity to protect Kenya's valuable and threatened cultural heritage.

"This pilot round has enabled the Cultural Protection Fund to open opportunities in new geographies and address different threats to valuable cultural heritage. Despite an exceptionally challenging year, these projects remained committed to delivering excellent work which will help us to shape how we continue to protect cultural heritage against global threats such as climate change."

*Stephanie Grant, Senior Programme Manager Cultural Protection Fund*

Images:

CPF funded project led by ICCROM (International Centre for the Study of the Preservation and Restoration of Cultural Property)





## Case study

# Sea Change 2019 - A global conference on the impacts of climate change on coastal heritage

World Monuments Fund

The Sea Change Conference brought together the international conservation community to understand the growing impact of climate change on the built heritage of coastal communities. This process helped identify gaps in understanding where new research might be commissioned to further the resilience of coastal communities in protecting vulnerable heritage assets. The conference had four themes centred on cultural identity, resilience, sustainability and best practice which were aimed at bringing out relevant case studies and research for consideration.

The Sea Change Conference took place in Blackpool in the Winter Gardens between 4-6th September 2019. Blackpool's Piers featured as a World Monuments Fund Watch site in 2018, one of only 25 identified across the world, specifically because the site spoke to a WMF priority of addressing the impacts of climate change. The conference was a tangible action of Watch listing and was funded by WMF, Blackpool Council, American Express, and the Senator Group. Organising participants included WMF, Blackpool Council, ICOMOS UK, Bournemouth University, Historic England and the Winter Gardens Trust. The project originated as an organisational response from WMF in seeking to align our Watch sites with one of the critical strategic themes of the organisation and for heritage more generally.

A specific issue at Blackpool, where the historic piers are threatened by increased storm surges, prompted a call to look at the broader issues faced by coastal heritage across the world and to explore solutions and share learning – this, by turn, turned into the conference.



The conference was also used as a way marker for the inaugural Heritage Climate Network in Edinburgh later in 2019 and signposted the launch and work of the Climate Heritage Network.

Within WMF, the conference galvanised an increased organisational focus on climate change, which has since been identified as one of WMF's key strategic themes, and by turn will influence the outcomes of the 2022 Watch. Our focus is to link strategic thinking with local delivery, with a particular focus on the needs of communities. As a next step, WMF would like to seek sponsorship to create a publication to share learning more widely.

### Key takeaways:

- Practitioners are not alone – one of the striking things about the conference was a sense of being able to talk to others faced with similar challenges, even if they are geographically distant.
- Heritage practitioners are well placed to 'show and tell' about the impact of climate change, given we record and manage the impacts from the distant and more recent past into the future
- We need to improve our messaging and learn the lessons of our partners in the world of natural environment campaigning.
- The heritage of loss is still widely underestimated and under explored – and yet this will feature significantly in the future. How should we deal with this via recording, transference and celebration?

Images:

World Monuments Fund Britain

# Decarbonising heritage

## Creating a low carbon heritage sector

Global efforts to avoid a climate change catastrophe centre on the need to drastically reduce global carbon emissions. As a sector, many organisations have worked hard to become greener, setting carbon targets, cutting energy use, shifting to renewables and encouraging more sustainable options for visitor travel. We know there is still a long way to go for many trusts and charities, but the need to act and commitment to invest in change is increasingly acknowledged.

To make this happen we need to assess our activity and find new and innovative ways to reduce our carbon footprint, build sustainability into operational plans from the outset, back up net zero pledges with robust implementation plans, implement green travel plans, look for viable, net zero ways to heat our buildings, continue to make the case for building adaptation over new build, and seek to actively lock up carbon through landscape restoration and sensitive peatland and ancient woodland management.



Image:

Pipework for the ground source heat pump, installed in front of Wimpole Hall'.

National Trust/Miranda Campbell



## Case study

# Holkham Estate Sustainable Tourism and Renewable Energy

Holkham Hall & Estate, Historic Houses

The historic Holkham Estate in Norfolk puts sustainability at its core. Holkham has implemented a zero-waste strategy across the estate, installed biomass boilers and solar farms to power commercial enterprises, and the new 'WONDER' strategy seeks to embed low-carbon living, environmental recovery and zero waste at the heart of its operations.

### Background

The historic Holkham Estate covers 10,000 hectares of land, including 18km of North Norfolk's coastline. The entire Estate, including some of its key business activities, are vulnerable to climate change and rising sea levels.

At Holkham we've called our sustainability strategy 'WONDER'. We believe Holkham is remarkable, somewhere more than a million people visit each year to admire and enjoy, and this strategy is essential in ensuring that Holkham continues to be a wonderland in years to come. We are now working on our three main sustainability focusses: pioneering environmental gain, championing low-carbon living, and stamping out waste.



Image:

Holkham Hall & Estate

### Our heat and energy supply

Two biomass boilers were installed in 2013, which use wood from the Estate to heat the Hall, the stables offices, the Courtyard Café, the gift shop, the visitor reception, the Estate Office and the Holkham Stories exhibition. Elsewhere, a 100-acre solar park consisting of 84,500 photovoltaic panels generates enough electricity to power 6,200 average homes, saving 8,800 tonnes of carbon dioxide annually. In addition, solar panels at the Beach Café and Pinewoods Holiday Park generate their own electricity. An anaerobic digester takes maize and rye grass grown on local farms and converts it into natural gas, which heats 2,500 homes in the winter and 40,000 homes in the summer.

### Our approach to plastic and waste

In 2018, Holkham Enterprises opened The Lookout on Holkham National Nature Reserve, a visitor centre providing much needed visitor facilities and interpretation to 800,000 annual visitors. Sustainability is at the heart of this operation; all packaging and catering consumables are made from compostable materials, free water is available from a drinking fountain, where possible all products are sourced from local suppliers, the estate's vehicles are electric, and ice-lollies are even wrapper-free. All visitor cafes at Holkham have adopted compostable packaging, removed single use plastics and practice recycling, sustainable procurement and waste management.

### The challenges we face

Holkham's rural location offers limited and infrequent public transport (meaning cars are essential) and a lack of businesses to work with (such as recycling collections), plus we struggle with unsustainable standards within some industries (e.g., all caravans are designed to use bottled gas for cooking and heating). But this is where the concept of 'supply and demand' is important, and we can use our influence to try to change some of these things.

Another challenge is ensuring that our staff, volunteers and visitors are on board. Team Holkham truly loves a challenge and individual teams are empowered to make changes both big and small. Inspirational communication is key with our visitors.

Stately homes are well placed to respond to climate change: we are local employers; we farm; we look after woodland and landscapes; we provide housing; we have space; and we have visitors. We can help to sustain our local communities with employment, housing and support; we can make the right decisions about the way we farm and manage our landscapes; and we can use our power and status to advocate and influence from policymaking right at the top, to decisions by our visitors at an individual level.

### Our message to others

Don't be put off by the scale and breadth of this challenge, you can start small and take on bigger challenges as your confidence and knowledge grow. Gain as much data as you can as a basis; with this you can make informed decisions on where best you can direct your efforts to deliver the biggest sustainable improvements. There is plenty of support out there – spend a little time researching great ideas and examples. Lastly, but most importantly, don't forget that staff and volunteers are the greatest asset – they love where they work, and their skills and passion are just what is needed to get the momentum going and start making those changes.

### Our next steps

Land management trials at our Great Farm project; reduced grass mowing; bird trails on the nature reserve; carbon audits across all our businesses; partnering with Good Journey to promote public transport, cycling and walking; low-carbon weddings; reducing our waste and improving our recycling rates; phasing out single-use plastic. If you'd like to find out more, click here to take a look at our projects.

Holkham's vision is 'to be the UK's most pioneering and sustainable rural estate'. This vision recognises that the estate has a responsibility to protect and enhance its incredible buildings, collections, diverse landscapes and wildlife for future generations, and that there is an opportunity to inform and inspire others on their own sustainability journeys.

## Case study

# Switching from oil to electric at St Andrew's Chedworth

Church of England

This project installed a combination of electric pew, panel and overhead heating to St Andrew's Church, Chedworth to move away from oil-fired heating to fully electric heating. In combination with a switch to 100% renewable electricity, the church is now "net zero carbon". Three phase power needed to be installed, but this did not prove to be a barrier to success. Operating costs are now lower, and church users are more comfortable.

St Andrews Chedworth is a Grade I listed Cotswold church in a village in the Diocese of Gloucester. It used to be heated via an oil-fired boiler to radiators with underfloor pipework. It had no mains water supply and a single-phase electrical connection. It is generally well maintained and has no issues with damp.

The existing oil boiler had reached the end of its life and the underfloor pipework was corroding; the church had experienced three significant underfloor pipework leaks in the last 5 years. The existing heating system was only just adequate to provide thermal comfort to the church when running.



The oil boiler could have been replaced and extensive re-piping of the system would have been required to fix the underground leaks. This would have left the church on oil; the highest carbon fuel, releasing more greenhouse gasses per unit of heat than gas or electric heating. The heating project cost a total of £38k, with VAT being reclaimed through the Listed Places of Worship Scheme.

### What did we add?

- A new three phase electrical supply was installed from a pole on the boundary of the churchyard in an excavated trench (with archaeological watching brief). At the same time, a water main was also laid into the church.
- Electric under-pew heaters were fixed to all pews, including the choir. Overhead heater units were used in the choir vestry and tower. Panel heaters were installed to heat open areas around the altar, pulpit, font and organ. Cabling was laid mainly under the floor using much of the old pipework routes.
- All existing radiators, the boiler and the oil tank were removed, creating more space in and around the church.

"This has been a successful heating scheme within this church, which has converted it from oil to electricity, improved the comfort, and reduced costs at the same time. The church now procures its electricity from 100% renewable sources and it is therefore net zero carbon because of this project. The project has deliberately included many forms of electrical heating in the church to allow others to come and see the various options for themselves, and we welcome visitors!"

Matt Fulford, Heating Project Manager at St Andrew's and Sustainability / Energy Advisor to Gloucester DAC

Image:

Church of England



## Case study

# Port Sunlight Village Trust Environmental Sustainability Strategy (ESS)

Port Sunlight Village Trust



A ten-year strategy to improve the climate change resilience for Port Sunlight Village Trust (PSVT) and the conservation area in its care. Including a baseline study, vision statement, aims, objectives and performance indicators, the ESS describes how PSVT will work in partnership with stakeholders to achieve its environmental sustainability vision.

“By 2030, we will improve our environmental performance and support our workforce, community, visitors and partners to be more sustainable, to create a greener future for everyone.”

Port Sunlight village was founded by William Lever in 1888 to create a community for the workers in his soap factory. Port Sunlight Village was designated as a conservation area in 1978 and comprises over 900 listed buildings and structures including the Grade I listed war memorial.

PSVT is responsible for:

- 130 acres of landscaped parkland and gardens,
- 292 Grade II-listed houses,
- 15 listed community or commercial buildings,
- Port Sunlight Museum & Gift Shop, including the Edwardian Worker's Cottage and SoapWorks,
- A dedicated centre for formal and informal learning.

- A diverse group of monuments (listed and unlisted), museum collection, and village archive.
- Tackling social issues and promoting community cohesion.
- Managing the visitor destination and raising its profile through partnership working, marketing activities, visitor services, product development, and events.

Delivered with match funding from Museum Development North West, PSVT commissioned the ESS to adopt a joined up and strategic approach to improve environmental sustainability across the organisation.

Based on the UN's Sustainability Goals, the ESS defines PSVT's vision for environmental sustainability and describes key actions for improvement in six areas; Energy, Water, Waste, Transportation, Business and Greening the Village.

As custodians of a heritage site with a diverse set of stakeholders PSVT has an important and exciting role to play in changing attitudes and behaviours as well as improving climate change resilience in the built and natural environments.

PSVT adopted its first environmental sustainability policy in 2011. However, PSVT did not have a holistic understanding of its organisational impact or opportunities for improvement; this was seen as a risk and lost opportunity. The ESS enabled organisation-wide understanding which will be embedded in all areas of business and inform priorities, budgets and actions going forward.

The ESS includes a report with comprehensive baseline study, environmental vision, aims and action plan for delivery. Supporting documents include an opportunity matrix for improving thermal performance of PSVT's listed built assets and a more detailed energy study.

Group working and consultation across the organisation were central to the development of the ESS. PSVT's working group included members of all directorates and a member of the board of trustees. Engagement helped to clarify baseline performance and to ensure that the action plan was specifically created for the charity and the site.

Through adoption of the ESS, PSVT has committed to reducing its environmental impact year on year, reducing the impacts to the environment from its facilities and operation, and championing biodiversity and sustainability as it cares for its natural and built heritage. The ESS will be implemented over the next ten years to allow PSVT to further reduce its impact on the environment whilst encouraging the community and visitors to do the same.

The ESS covers carbon emissions, biodiversity, waste, water, energy, transportation and business activities. The ESS was adopted in June 2021, so progress cannot yet be mapped. However, the action plan includes indicators to track performance.

Image:

Port Sunlight Village Trust

## Case study

# Wimpole Renewables

National Trust

Wimpole Hall is a Grade I listed mansion with a spectacular architectural pedigree; the newly installed heat pump system combined with the National Trust's largest solar PV scheme to date saves over 140 tonnes of CO<sup>2</sup> emissions a year.

Wimpole Hall is a mansion with a rich history of many different owners, all putting their mark on the architecture and interior design of the building. From Sir John Soanes Yellow Drawing room to delicate French porcelain figures and Rudyard Kipling's books, the newly installed heat pump system provides stable humidity conditions to protect the collection whilst reducing the Hall's carbon footprint. The Trust's largest solar PV scheme to date supplies the heat pump but also exports green energy to the grid.

### Background

Wimpole Hall is a complex house with a spectacular architectural pedigree. Wimpole's interior is a rich mixture of mainly 18th-century decoration, including a spectacular Baroque chapel with trompe l'oeil murals by Thornhill.

Wimpole has long been an estate able to provide its own resources. A look at the Ordnance Survey map from 1903 tells you that, as well as the kitchen garden, farms, reservoir, smithy, woodyard, claypits, and fishponds, the mansion was once lit using gas produced on site.

Image:

National Trust

Over a century later, Wimpole is now producing a significant proportion of its own heat and electricity through the marriage of two renewable technologies:

- 180kW of ground source (borehole) heat pumps providing heating to the mansion's showrooms, staff flats and office, as well as heating and hot water for the Old Rectory Restaurant.
- 200 kW ground mounted photovoltaic panels adjacent to the new Visitor Reception and car park

The Wimpole team were very engaged in the project. The project team recognised that it was very important to involve staff and volunteers from the beginning and provide them with a good understanding of the work involved and the reasons behind it. Pre-planning and design and plan stage research and work was invaluable and vital to the success of the project.

### Projected results

Significant reduction in Scope 1 carbon emissions, expected to be in the over 200 tonnes of carbon each year. Removal of risk of leakage or spill of 35,500 litres of oil used to run the former boiler each year.

### Top tips

- Ensure contractors are aware that mapping is indicative, not definitive.
- The timetable for planning process is subject to local planning department changes.



### Key takeaway

Get everyone involved! The public and property are excited about works like this, and it also provides an opportunity to share the reasoning behind it with visitors. For example, discussing the link between heating and conservation and what the National Trust is doing to ensure its sustainability for the future.

### Next steps

Thanks to the Green Recovery Challenge Fund (part of the National Lottery Heritage Fund), we will be continuing to audit and reduce carbon emissions in our operations at Wimpole as well as sequestering carbon in our land. This will include creating woodland, woodland pasture and agroforestry on 120Ha of land on the Wimpole estate.

The renewables in place at Wimpole are part of a wider commitment and project to be carbon net zero across the operational line at the Wimpole Estate.

We have been tracking and reducing carbon across food and beverages, heating, lighting, electrification of equipment and in our gardens, farm and countryside.

Read more about the project here: [www.nationaltrust.org.uk/wimpole-estate/projects/going-green-renewable-energy-at-wimpole](http://www.nationaltrust.org.uk/wimpole-estate/projects/going-green-renewable-energy-at-wimpole).



# Supporting and enabling sustainable communities

Strengthening resilience through adaptation and engagement

**W**e know climate change will have a significant impact on communities around the country. Heritage can help us respond and act in a number of ways. Our primary response has to be in retaining – and adapting – what we already have, and what is valued by local people and visitors alike. Utilising and adapting historic buildings prevents the loss of embedded carbon already locked up in existing structures, and can offer new and creative uses of valued assets. Likewise, utilising and adapting traditional and nature-based solutions helps to create resilient historic landscapes.

Investing in heritage over new build can breathe new life into urban and rural areas by repurposing and reusing historic buildings and enhancing local resilience. Historic places are inherently sustainable; their structure and design support a local live-work lifestyle, reducing the need to travel and providing a sustainable model for future development.

Heritage organisations can also play an important role in assisting smaller and community-led organisations to make informed choices, particularly on the right technological solutions for decarbonising their historic assets. The involvement of the local community stakeholders who know and love their heritage in decision-making is crucial to successful climate change management, fostering resilient heritage and resilient communities.



Image:

Finsley Gate Canal Wharf – Restored listed building group is set to bring major economic and cultural benefits to Burnley.  
*Canal & River Trust*

## Case study

### The Historic Church of St Mary the Less, Thetford, Norfolk, Grade II\*

Freeman Historic Properties Ltd

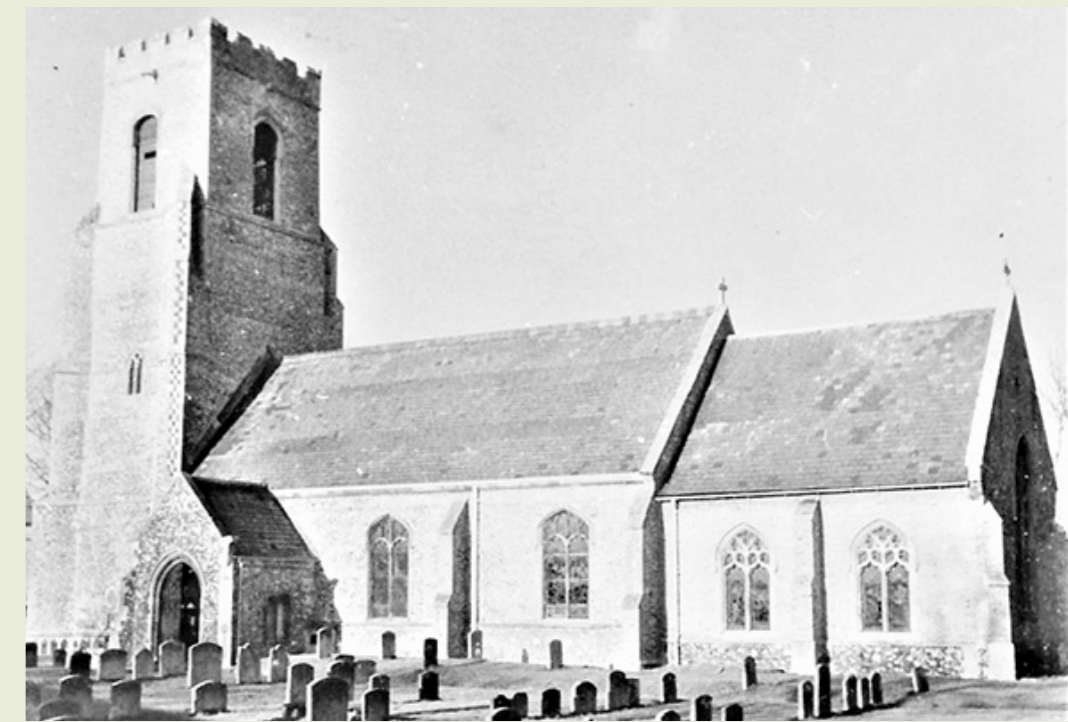
**F**reeman Historic Properties Ltd (FHP) plans to convert the historic Church of St Mary the Less to much-needed housing, extending its life cycle for many years to come.

FHP specialises in repairing and regenerating highly graded listed buildings ‘at risk’ of loss.

#### Background

Compared with the usually shorter life cycle of modern buildings, historic buildings offer better longterm value. One shocking example demonstrates this: – it is anticipated that over 500,000 houses built since 2017 will soon require retrofitting to cope with warming temperatures and future heatwaves, reported the Government’s Climate Change Committee in July (2021). Older properties fare better, being less susceptible to huge temperature swings. This, and other positive factors favouring older buildings should be taken into account when resources are allocated.

Furthermore, repair works to older buildings can often be achieved with lower energy input, by re-using building materials and sourcing new materials locally. Less power is required. The result is less upheaval, less polluting noise and dust and, overall, a ‘greener’ project. Increasingly new research confirms this view, but the culture and the ‘philosophy’ needs to spread.



The repair project to St Mary’s proved highly complex and more expensive than anticipated. Fifty years of disrepair had taken their toll. The Tower had been fire-damaged and vandalised during the long period of disuse. None of the team on site could have been aware of the extent of disrepair to the Tower until the scaffolding went up and deep investigations of the corner buttresses began in earnest. Even with a generous grant from Historic England it was obvious that FHP’s budget would not extend to the conversion of the whole church into five houses.

The church is now being marketed, its tall medieval Tower now fastidiously repaired, for conversion to the five houses originally envisaged. Happily for FHP Ltd, great interest is being shown.

No newbuild will be introduced into the attractive historic churchyard which, together with the Church, stands in a designated Conservation Area. In addition to the magnificent trees, a fascinating range of monuments, some of which are listed, are being retained. Recovered sound timbers and stonework are being held in the church for possible re-instatement in the houses or the churchyard for outdoor seating or other uses.

**FHP’s proposals for St Mary the Less will provide much needed housing, with major structural repairs not envisaged to be required for some 50 years.**

A building that dates probably from before the Norman Conquest will get its chance again for years of beneficial use. Thetford needs regeneration – as do many small towns – yet there is much local pride in its long history and historic fabric. FHP hopes to save a portion of that for future generations in a sensitive, cost-effective way that will stand the test of time.

Image:

*Freeman Historic Properties Ltd*



## Case study

# Restoration of Finsley Gate wharf, Leeds & Liverpool Canal, Burnley

Canal & River Trust

A £2.9 million restoration of the historic Burnley Canal wharf, which is set to bring major benefits to the former textile town. An important canal wharf and three Grade II listed buildings have been saved and given a new use and by doing so, the lifespan of the buildings has been extended and embodied carbon has been retained.

### Background

Finsley Gate Wharf is a former canal maintenance yard on the Leeds & Liverpool Canal in Burnley, Lancashire, dating from c 1801. It contains three listed buildings including workshops, a forge and the superintendent's house. The yard has been disused since 1995 and following the unauthorised removal of roofing materials the buildings had become derelict.

The 18-month project saw the restoration of the three buildings: the workshops have been converted to a bar and restaurant and function room; the house to a guest house; the former forge has been restored to working condition and a class/community room has been created.

The site has been restored by the Canal & River Trust with financial assistance from National Lottery Heritage Fund, European Regional Development Fund and Burnley Council. The site will be leased to a management company, Finsley Gate Wharf Ltd who will run the bar, restaurant, and guest house.

Adaptive reuse of the existing buildings and building materials reduces the embodied carbon compared with the alternative of demolition. Refurbishment can improve the energy efficiency of existing buildings by adding insulation and replacing old systems with more energy efficient ones- these additions can extend the lifespan of the building and so help avoid the embodied carbon needed to replace an old building with a new one.

Sympathetic adaptations, informed by assessment and understanding of heritage significance, can serve to return redundant historic buildings to good repair and beneficial use, thereby securing their longevity and future on-going maintenance,

As part of the project, we engaged the local community who will help run the community room, help with interpretation, and restore the house garden.

The bar and restaurant are now operating; the forge is complete and has hosted a guest blacksmith for several community events. Works to the house are nearing completion.

retaining the embodied carbon and improving energy efficiency, whilst conserving the unique heritage value of these buildings.

### What's next?

Creation of a new community heritage and learning hub, wildlife trail, cafe bar, restaurant, function room, guest house and garden. It is hoped that the project will lead to further regeneration in this part of Burnley. The project will also lead to further engagement between canal and the local community, benefiting all. Read more about the project here: [canalrivertrust.org.uk/news-and-views/news/finsley-gate-wharf-gives-major-boost-to-historic-textile-town](http://canalrivertrust.org.uk/news-and-views/news/finsley-gate-wharf-gives-major-boost-to-historic-textile-town)

Image:

Canal & River Trust



## Case study

# Jubilee Pool

The Architectural Heritage Fund

Grade II listed Jubilee Pool is the largest and most celebrated seawater lido in the UK and provides safe access to seawater swimming for people of all ages, as well as a range of water-based activities and sports.

The Jubilee Pool project balanced local need and tourism potential to create an environmentally and financially sustainable, year-round attraction using innovative technology.

The pool, named for George V's Silver Jubilee, is the first lido in the UK to use geothermal heating. By using this low-energy heating method, the pool can remain open and generate income throughout the year, enabling financial sustainability, without expending significant fossil fuel energy. The system is the first of its kind in the UK and will act as a showcase for geothermal, low-carbon heat supply.

Jubilee Pool in Penzance was opened in 1935 at a time when Art Deco outdoor lidos were extremely fashionable and has been a regional landmark ever since. It is the largest of only five surviving seawater lidos in the UK, Grade II-listed, and sits in a commanding position with views across Mount's Bay to St Michael's Mount.

In 2014 the pool was hit by a devastating storm, resulting in significant damage, and it was only re-opened in 2016 after nearly £3 million had been raised. At this point, however, it became clear that a new plan was needed to secure the pool's future. The first step was to form Jubilee Pool Penzance Limited, a community-run social enterprise in the form of a charitable Community Benefit Society, which took control of the lido

Image:

Architectural Heritage Fund



in 2017. This structure meant the pool would be run for the community, by the community.

To achieve financial sustainability, the project team needed to look at ways the pool could remain open for more than four months per year and reduce dependence on warm weather. In 2018, they launched an ambitious fundraising Community Share offer to geothermally heat a section of the pool, which could bring in paying swimmers throughout the year. Nearly £540,000 of the £1.8m funding came through community shares, and the Power to Change, Architectural Heritage Fund and Cooperative Community Investment Fund stepped in to provide the rest through loans and grants.

### How does it work?

The geothermal system installed operates by extracting warm water from a deep well, taking heat out of that water using heat pumps and distributing it to the pool via a heat exchanger, before re-injecting the cooler water from the pool's surface back into the ground. This combined system means that the temperature of the pool can be sustained year-round with a very low carbon footprint. The system is the first of its kind in the UK and will act as a showcase for geothermal, low-carbon heat supply.

Now able to remain open throughout the year, the pool's financial sustainability had dramatically improved:

- The whole pool contains 5 million litres of sea water.
- It has no mechanical filtration and minimal chemical treatment for a natural sea water bathing experience and a robust cleaning regime to keep it clean and safe.

- The geothermal pool has additional UV filtration in place to maintain the water quality in higher temperatures and is heated to 30-35 degrees via its own 410m deep geothermal well.
- The geothermal system operates by extracting warm water from the geothermal well taking heat out of that water using heat pumps and distributing it to the pool via a heat exchanger, before re-injecting the cooler water back into the ground.
- This combined system means that the temperature of the pool can be sustained with a very low carbon footprint.

Due to its heat, the geothermal pool enables this community-centred organisation to generate profits year-round, creating important employment opportunities for local people and increasing its resilience against future shocks.

The Jubilee Pool project demonstrates what is possible through dedicated community building and innovative thinking.

Local voices and values helped shape the decision to pursue a geothermal pool, and local supporters led discussions surrounding its construction, championed the project as an important income generator for Penzance, provided funding that enabled the project and ultimately will be the ones to use it regularly. This level of community engagement and involvement, and the general appeal of the geothermal proposition, has meant that the pool has been achieved nearly full occupancy when it has been able to open.



# Championing nature

## Supporting nature and culture-based solutions to climate change



Image:

The historic Knepp Estate in Sussex is home to one of the oldest and largest rewilding projects in lowland Britain. It is now a haven for biodiversity and a leading pioneer of landscape regeneration.  
*Knepp Estate*

**T**he historic environment is made up of so much more than buildings and structures. We care for our country's rich and diverse historic landscapes, coastlines and marine heritage and have a duty of care for the delicate eco-systems which exist within our natural habitats. There is a long tradition of adjusting land management practice and river restoration to improve preparedness to floods and landslides, and we protect historic coastal landscapes at risk of storm surges and rising sea levels.

What's good for nature is often good for heritage and vice versa, for example the protection of peatland which is hugely valuable for buried archaeology as it is for biodiversity and carbon sequestration. Our

view must go beyond protecting nature within a heritage context, and we are increasingly embracing nature-based solutions and former traditional land management practice to improve conservation, to reduce risk and mitigate climate change. Understanding and working with natural processes, particularly in rivers and dynamic coastal environments, is also challenging the heritage sector to consider what it values and what influence it can have in the face of changing weather patterns and sea level rise.

## Case study

### Changing minds: changing coasts: Mapping coastal change 1920-2020

CITiZAN Museum of London Archaeology

**A** citizen-science-based eco-archaeological project mapping dramatic changes to the Essex coast on Mersea Island from 1920 to 2020, using the coastal community's observations, memories, photographs and maps.

The project looks not just at where and when changes took place, but 'why?'. It considers the often negative interaction of human activities on natural processes relating to coastal change, climate change and relative sea level rise over the last century. We now know what happened in the past, so can ask what might happen to that coast in the next century? Can we change that future?

This project mapped 100 years of dramatic coastal change. Using photos, postcards and memories held within the local community MOLA learned more about not just where and when such changes took place, but why they happened. Combining 350 images, several hours of interviews and a series of historical maps, local volunteers created a striking story of Mersea Island's transformation between 1920-2020.

Information collected was arranged into twenty-year periods: 1920-40; 1940-60; 1960-80, and 1980-2000, then analysed against key indicators: Topography, Saltmarsh, Archaeological features, High Waterlines, Culture and Biodiversity. This added colour and detail to the maps while redrawing Mersea's coastlines and changing habitats. Many factors contributed to Mersea Island's changing coast, with an alarming negative interaction between human activities and natural processes. But the loss of eel grass proved pivotal, since it increased the speed of erosion over the last 50 years.

**Location:** On Mersea Island, from MOLA offices and remote laptops.

**Team:** CITiZAN (Coastal and Intertidal Zone Archaeological Network) is a national community-based organisation running several regional programmes including the Mersea Island Discovery Programme. Supported by the National Lottery Heritage Fund, administered by Museum of London Archaeology.

**Funding:** Undertaken with grant from Natural Environment Research Council

This historical coastal mapping project has shown us what happened in the past century and has documented the accelerating rate of change. As a consequence, we can now ask what might happen to that coast in the next century? And how might we adapt or change that future?

This successful pilot project is now being reworked as a major national project, to study four more English coastal locations with differing topographies and differing coastal communities.

Image:

CITiZAN Museum of London Archaeology





## Case study

# Fountains Abbey, Skell Valley, North Yorkshire

The National Trust and Nidderdale Area of Outstanding Natural Beauty

**A** £2.5m National Trust project – aided by a £1.4m grant from National Lottery Heritage Fund – will implement nature-based solutions to improve the resilience of Skell Valley's resilience to changing weather.

The UK's largest monastic ruins, Fountains Abbey, near Ripon in North Yorkshire have stood in the Skell Valley for 800 years. The valley has been flooded several times in recent years, raising fears that the ruins are at risk of irreparable damage.

The Skell Valley scheme began in March 2021 and aims to rejuvenate 12 miles of the River Skell, beginning at Dallowgill Moor and ending in the city of Ripon. The National Trust alongside the Nidderdale Area of Outstanding Natural Beauty (AONB), will plant six hectares (15 acres) of trees, create eight ponds and revive a nature reserve to reduce soil runoff and slow the flow of water. Flooding in the north of England has worsened in the past 50 years, and the risk is high in the Skell area.

The scheme also hopes to attract new visitors by tackling some of the barriers people face in accessing the countryside, creating new walking trails and improving signs and information. The project also hopes to support local health and well-being by providing better access to the outdoors.



Read more about the project here: [www.nationaltrust.org.uk/fountains-abbey-and-studley-royal-water-garden/projects/the-skell-valley-project](http://www.nationaltrust.org.uk/fountains-abbey-and-studley-royal-water-garden/projects/the-skell-valley-project).

Image:

National Trust/Chris Lacey

The scheme will partner with 16 local farmers and landowners across the Skell Valley, who will be rewarded for implementing nature-based solutions to reduce flooding and improve biodiversity in and around the river.

## Case study

# Repair of Toneworks, Wellington, Somerset

Historic England

**T**he project is to bring back to repair the Toneworks site focusing on the re-use of the historic building, incorporating issues of flood toleration and working with, and not against the environment to bring the site back into meaningful use.

### Background

The main focus is on the Toneworks site (Grade II\*) but it also has wider reaches to the Grade II aspect of the Tonework site as well as Tonedale House (Grade II) and Tonedale Mills East and West Complexes (Grade II\*). The sites and the wider landscape originally formed part of the Fox Brothers Textile Mill, one of the oldest and largest woollen and worsted manufacturers in the South-West of England.

### Engagement

The key role for Historic England was as a partner to the Local Planning Authority. It has had significant architect and partnerships lead input at operational level. The project has also seen significant input from the Wellington Mills CIC, a community group who have been developing themselves and beginning to deliver other associated projects and who may become an end user for the site. They are instrumental in providing a link to the community and will be undertaking further community consultation. The project tried to get all stakeholders to come together to work on the issues where common outcomes are viewed through very different lenses. Project has received capacity building, acquisition, and DCMS COVID-19 recovery grant (Heritage Stimulus Fund Round 1).

It is the first stage of a much larger incremental collaborative project which will continue to develop and run over a number of years. Phase 1 works for decontamination and emergency structural propping took place to make the building safer for access and feasibility to be conducted. This has allowed access for the local community group to begin to start engaging with the community and establish their wishes for the site. Phase 2 will be moving ahead soon for the most urgent works to safeguard the buildings.

The approach has been changed since conception and is now much more environmentally focussed, ensuring the re-use of historic materials, the wish for energy generation within the site as well as a sustainable building for the long term. It also seeks to be a haven for wildlife drawing on and harnessing the environment which had largely taken over the site: Using the cooling ponds to observe wildlife, creating a bird hide and a wildlife corridor all the way to the Wellington Basins. The connectivity of the watercourses is essential, and we are working with the Environment Agency to improve not only the environmental aspects but also the strategic flooding issues.

Long term additional benefits include potentially growing and distributing food or plants which have been grown on the site, creating jobs, volunteering opportunities, making spaces and cultural opportunities as well as significant wellbeing and leisure opportunities for the community to engage with.



Image:

Historic England



## Case study

# Nature Based Solutions – Heritage and Nature for Climate Resilience

English Heritage and the University of Oxford are working in collaboration to develop a new research agenda to inform more sustainable approaches to historic monument and building conservation. One of the key areas of focus is the interaction and inter-dependency of nature and monuments, exploring the further application of Nature Based Solutions to build climate resilience.

The purpose of this project was to bring together the expertise of the University of Oxford Resilient Buildings and Landscape Lab (OxRBL) with key staff from English Heritage.

Together, we explored the issues faced in addressing conservation in a changing environment – vulnerability, deterioration, vegetation growth, sea level rise – and the need for more environmentally and financially sustainable approaches to maintenance. This built on earlier work by English Heritage in piloting ‘soft capping’ to wall tops and remains to better protect them from water ingress and frost damage at places such as Hailes Abbey (Gloucestershire).

The science and practice are now evolving into a wider areas of application of ‘nature based solutions’ to both enhance biodiversity and help vulnerable exposed buildings and monuments become more resilient to climate change.



Read more on nature-based solutions here: [www.ox.ac.uk/news/2021-06-10-enhancing-urban-life-and-heritage-nature-based-solutions-city](http://www.ox.ac.uk/news/2021-06-10-enhancing-urban-life-and-heritage-nature-based-solutions-city)

Supported by the University of Oxford's Higher Education Innovation Fund (HEIF) Social Sciences Engagement Fellowship scheme.

Read more on nature-based solutions here: [www.ox.ac.uk/news/2021-06-10-enhancing-urban-life-and-heritage-nature-based-solutions-city](http://www.ox.ac.uk/news/2021-06-10-enhancing-urban-life-and-heritage-nature-based-solutions-city).

Image:

University of Oxford

# Improving energy efficiency

## Making the case for historic buildings

Historic buildings are the ultimate low carbon and recyclable product. They are also often made from natural materials, are endlessly adaptable, and can keep carbon locked up for centuries, and we've learnt so much about this in recent years. But they need to be

well maintained, with respect to their significance and character, and avoid inappropriate modern measures, materials and interventions only suitable for new build. Retrofit offers important environmental gains but, as with any activity, the impact of retrofit itself must be considered and sustainable, low carbon choices should be made. A solution-focussed, ‘whole building’ approach will support design changes effectively and deliver results for occupants and the climate.



Image:

PassivHaus front door and windows at Zetland Road  
Rick McCullagh



## Case study

# Grosvenor Britain & Ireland's Energy Savings Fund

Grosvenor Britain & Ireland

A £90m ring-fenced commitment to a targeted energy saving and retrofit programme which will reduce energy use and greenhouse gas emissions across Grosvenor's Mayfair and Belgravia portfolio by over 70% between 2020 and 2030.

These investments and innovative interventions will future-proof heritage and other buildings across the 500 sites that Grosvenor manages across this portfolio, which are mostly within a conservation area and include 500 Grade I and II listed buildings and structures.

### Background

Grosvenor is committed to achieving net zero carbon by 2030. In 2019, our buildings accounted for 32% of our emissions. If we are to meet this goal we have to prioritise retrofit, alongside other measures to reduce energy demand and increase renewables use. It can sometimes be challenging to retrofit historic properties to a net zero standard so ring-fencing a pool of capital for the works required to improve the energy intensity of properties was a critical first step for us.

In 2021, the first full year of operation for our energy saving programme, we expect to work on properties covering 270,000 sq ft including c120 commercial units and 50 market let residential flats.



We are committed to publicly reporting on our full net zero carbon pathway every year until 2030, including the impact of the energy saving programme alongside other measures relating to property development and management. These investments and innovative interventions will reduce energy use, use of fossil fuels and greenhouse gas emissions from these properties by over 70% between 2020 and 2030.

Grosvenor's 2030 net zero goals are unlikely to be met with 'one hit'. We will stagger works and spend effectively to take advantage of maturing technology and processes and reduce the amount of time a building is out of use. Our goals and routes to achieving them will continue to evolve as legislation, technology and our own capabilities mature.

### Stakeholders and partnerships

Building supply chain and tenant buy-in has been critical for Grosvenor; this is a process our stakeholders are part of, and we have worked hard to make this easy for them.

For tenants, we built a simple visual reporting framework, a Building Performance Evaluation (BPE), to demonstrate potential interventions, costs and impacts in each property which also allows for efficiently planning works overtime.

Grosvenor Britain & Ireland also contributes money and support for works which ensures the quality and standard of works and reduces the need for additional interventions as tenants change. This partnership approach has enabled Grosvenor to broaden conversations beyond building fabric, to changing behaviours around energy use and savings.

Find out more at [Grosvenor.com/thinkzero](https://www.grosvenor.com/thinkzero)

Image:

Grey Hutton

## Case study

# Victorian Townhouse Meets Passive House Standards in Zetland Road

Historic England

This project adapted a pair of typical 'hard to treat' Victorian townhouses in Manchester to meet the demanding PassivHaus standard, demonstrating that historic buildings can be made highly energy efficient.

This was accomplished without compromising the buildings' heritage and the houses have now been retrofitted to become Europe's first Passivhaus Enerphit Plus standard homes. The project was carried out by ecospheric.

### Background

From the road the buildings keep their Victorian appearance with the original brickwork incorporated into the design to provide thermal mass. The technologies used enable the house to achieve the Enerphit Plus standard of generating 60 kilowatt hours of renewable energy each year for every square metre of floor area. This is produced by 60 square metres of photovoltaic cells on the roof. These are secreted away on the rear façade and use voltage optimisation technologies to make use of non-optimal roof pitches. The insulation and ventilation allow the house to maintain comfortable temperatures and air quality year-round without a central heating system.

The approach adopted by the developer, Ecospheric, was to use natural materials as far as possible and minimise the use of petrochemicals (all bulk fabric was organic). Internal insulation of the brickwork is achieved using timber 'I' joists with blown cellulose and wood fibre board. The original building footprints were kept, avoiding the need to add further embodied carbon by adding extensions.



use of biocides and resisting rot and ultraviolet degradation for 30 years. Windows are angled towards the sun, within the insulation layer, to maximise passive solar gain. Each layer of the walls, roof and floors is highly breathable to allow drying both inside and out should moisture get in in the future.

Treatment of the sides of the buildings reverses the approach used on the street face, with the insulation on the outside of the brickwork. Sustainably sourced timber 'I' joists support cellulose insulation covered in wood fibre with a lime-based finish. Lime has been a critical material in the project, providing the breathability that is central to the project's design philosophy.

### Next steps

The developer has installed some post occupancy monitoring devices measuring 9 air quality metrics which will run for 2 years. They are also working with the university of Liverpool to perform a full embodied carbon analysis. This research will understand the effects of decarbonisation over the life of the building due to the PH conversion. It will also understand the embodied carbon impact of selecting an all-organic retrofit Vs an all-petrochemical retrofit.

Images:

Rick McCullagh

The evaluation alongside occupant feedback has shown positive results for thermal comfort, air quality, ease of use and reduction in bills.

The backs of the buildings have been treated with an external cladding of 'Organowood', a novel approach to wood preservation using silica to partially fossilise timber without the

The Zetland Road PassivHaus project was always intended as a valuable case study that would not only inspire others to follow suit, but also to share information on how it can be achieved.

The push to meet the world's highest standards has led to the creation of techniques, details and products that can be shared with the construction community.



## Case study

# Restoration, renovation and repair

Wentworth Woodhouse Preservation Trust (WWPT)

Restoration, renovation, and fabric repair of the highest conservation standards of a Grade I listed Georgian site currently on the Historic England Heritage at Risk Register. Comprising Mansion, Stables, Riding School and Camellia House, giving them a new 21st century purpose and making adaptations to combat the effects of climate change whilst seeking sustainable energy solutions.

### Background

Guided initially by Historic England who were administering a grant of £7.6m directly from the UK Government, the projects started with emergency roof repairs then as quickly as possible moved to fabric repair of the most critical roofs, upgrade, and improvement to cope with climate change.

Funded by Historic England, Wentworth Woodhouse researched and launched a long-term (20-year) Masterplan in 2018, broken-down into manageable projects. The aim is to sensitively transform the former private house into a fully sustainable business providing employment, entertainment, events, commercial offers, and education.

Creating a culture that considers how sustainable improvements can be introduced as a matter of course is critical:

- Introducing breathable insulation under, between and over the rafters has not significantly altered the roof appearance.
- The redesign of the gutters to cope with climate change has been possible with the undiluted use of heritage skills and does not significantly impact on the appearance of the building.
- The technology and strategy for renewable heating solutions as advised by specialist consultants has changed over the duration of the project meaning technology is still evolving and new solutions must continue to be explored.



Image:  
Donald Insall Associates

National Lottery Heritage Fund-supported work is currently in progress developing detailed designs for the first of the Masterplan projects, to bring the Camellia House, Riding School and Stables back into use. Subject to second-round funding being confirmed, the Camellia House project is programmed for delivery in 2022, to be followed by the Riding School and Stables as soon as funding can be found.

WWPT took on the regeneration of this site to achieve positive environmental, economic and social impact in Rotherham and South Yorkshire.

### Restoration, renovation, and fabric repair:

- Original slates from the roof have been recycled and reused where appropriate, those that can no longer be used for roofing have been repurposed.
- We have installed breathable insulation in the roofs to reduce carbon emissions whilst maintaining a traditional breathable construction.
- Re-design of roof layout to cope with climate change has been critical – large reservoirs have been introduced to catch rainfall and manage water flow to the hoppers so that water is captured.
- Enabling works have been carried out so that a ground source heat pump system can be introduced to the mansion as soon as funding is sourced, renewable ground source heating systems for the Stables and Camellia House are also planned and the first is expected to be commissioned in 2022.
- Rainwater harvesting tanks have been included in the new design.
- Biodiversity on the site is being tracked and measured.

Heritage Skills training has taken place throughout the programme and shall continue. Of the 49 new jobs created on site since the Trust took ownership 93% live within the local area and 95% of the capital expenditure to date has been with local companies within a 35-mile radius of Wentworth.

## Case study

# Alexandra Palace: West Hall lighting project

Alexandra Palace

The team at Alexandra Palace replaced the existing house lighting in the West Hall with new energy efficient lighting, reducing energy consumption and electricity costs, making Alexandra Palace more efficient and cost effective as a venue.

This project is a partnership between Alexandra Park & Palace Charitable Trust, Salix and Haringey Council.

### Background

The West Hall at Alexandra Palace typically hosts a packed and diverse programme of events throughout the calendar year, covering live music, comedy, exhibitions and elite sport. It is home to the iconic World Darts Championship, the Masters Snooker and in recent times welcomed critically acclaimed performances from the likes of Nick Cave.

Much of the lighting infrastructure at Alexandra Palace was more than 30 years old, energy inefficient and had significant maintenance costs. We had already replaced much of the lighting across other areas of the site and the West Hall was the next key space that required upgrading.

As a blackout space with no natural light, the lights in the West Hall are used intensively, so installation of energy replacement alternative and smart control systems will make a significant impact on our energy consumption. The capital costs are funded by Salix, to be repaid through savings in utility bills in the coming years.

Assisted by expert consultants including Andrew Selwood at Ridge Consulting, we had identified the replacement of our old lighting infrastructure with new energy efficient lighting as a priority in helping Alexandra Palace become more energy

efficient. We have replaced existing lighting where possible, but the West Hall was a large project, difficult to achieve when the building is in use. The pandemic offered us a window of opportunity, as the West Hall was not being used for public events.

The project is currently underway, and we are expecting a significant reduction in utility bills in future.

### Next steps

Once this project is completed, most of the main lighting inside Alexandra Palace will be energy efficient. We will seek to replace all of the legacy lighting in future. We are also looking at replacement lighting across the 196-acre park.



As always with managing a venue, planning is key.

Co-ordinating projects to minimise the disruption on the venue is vital. Making the venue more energy efficient will reduce our carbon consumption and make us more financially resilient, so it is a key priority for us.

Image:  
Joel Ryan



# Investing in training and skills

## Building both new and traditional skills for sustainability

The heritage sector is entering new areas and still has much to learn. Training and skills development is therefore crucial, and the Fit for the Future Network in particular has been hugely proactive in bringing together heritage, environment and sustainability practitioners to share and learn from one another in this area. The value of peer learning is proving immense.

But we need to face into the significant shortage of people with traditional construction and heritage conservation skills if we are truly able to step up to climate change. There's no point worrying about climate adaptation or carbon reduction if the assets we care about are in poor condition.

A building that is not well maintained will be inherently less energy efficient and more exposed and vulnerable to the potential impacts of climate change than one that is well cared for. Likewise, peatlands emit rather than store carbon if not properly cared for. Investing in both 'traditional', land management and new heritage skills would therefore help address climate change and create highly prized new jobs, creating much needed capacity across the sector.



Image:

Restoration of Stainton Aqueduct following storm damage.  
*Canal & River Trust*

## Case study

### The Fit for the Future Network

The Fit for the Future Network

The Fit for the Future network is an environmental sustainability network aiming to accelerate action through peer-to-peer learning based on the sharing of experience and knowledge.

The network was created by the National Trust in collaboration with Ashden in 2013 and enables hundreds of practitioners to deliver practical, transformational change for organisations. The network's vision is that all organisations will achieve the rapid and far-reaching changes to operate sustainably and responsibly into the future.

#### How does it work?

Fit for the Future facilitates collaboration and knowledge-sharing of best practice across organisations and sectors so that they can achieve the rapid and far-reaching changes needed to decarbonise, adapt to climate change, build business resilience and drive positive environmental impacts. The network supports organisations by facilitating cross-sector collaboration to ensure that the best ideas and practical solutions for responding to environmental sustainability challenges are shared and implemented successfully.

Network activity covers diverse sustainability issues including energy management, transport, waste, construction e.g. retrofitting, biodiversity, land use, net zero strategies and climate-change/adaptation. The development and delivery of sustainability within heritage is a key focus of the network, linking many areas of activity. Fit for the Future member activity include seminars/webinars, site visits (tours), one-to-one member linkups and the sharing of online resources

#### Membership

The network has evolved and grown and now has more than 600 individuals from over 120 member organisations. Membership is diverse (predominantly from the Third Sector) and includes English Heritage, Historic England, Historic Environment Scotland, RSPB, The Woodland Trust, The Church of England, Cancer Research UK, RNLI, Guide Dogs for the Blind, Oxfam, The V&A, Historic Royal Palaces, The Landmark Trust and Kew Gardens. A recent collaboration with the National Lottery Heritage Fund has enabled an increasingly diverse range of heritage focused organisations to join Fit for the Future, increasing the scope and impact of the network.





## Case study

# PRO-Heritage Traditional Built Heritage Skills

Cultura Trust and English Heritage

The PRO-Heritage project will provide training for Craftspeople in the energy efficiency of traditional buildings.

PRO-Heritage is a European funded project involving seven partners from five countries. Highlighting best practice case studies and completing in 2022, it will produce certified training for Tradespeople and Facilities Managers working on traditional (pre-1919) buildings relating to their respective trades, focussing on energy efficiency measures.

It was obvious from an early stage that the UK and Scotland in particular was far further advanced with regard to energy efficiency measures than all other European countries. The evidence to demonstrate best practice has been nearly non-existent in some countries, and difficult to locate in others, so the 'one-stop shop' provided in the training material will be an invaluable tool/step.

The project training will be provided through blended learning – a combination of face-to-face and written work. It will result in the equivalent of an NVQ level 3 and is intended to improve the approaches undertaken to energy efficiency measures for traditional buildings across Europe.

The project aims to produce a European-certified qualification in energy efficiency for traditional buildings for Craftspeople of all trades as well as Facility Managers. The project began in November 2019, and an extension has been requested owing to the pandemic which will mean it will be ready in July 2022.



PRO-Heritage will provide training material which can be accessed and delivered by all partner organisations (through a Train the Trainer programme) to upskill the construction sector in knowledge and understanding of potential sustainable measures for traditional buildings.

PRO-Heritage will produce guidance and links to relevant information and case studies across the five countries involved. The project is intended to give Practitioners a wider understanding of the potential measures that can be adopted for traditional buildings (which makes up 25% of building stock within the UK alone) as well as the potential consequences of those that are inappropriate.

The PRO-Heritage project will continue – the Burghauptmannschaft in Austria for example has set up a European Training Academy to provide the qualification, following the same highly successful take-up from the previous MOD-IFY project. All other partner countries are also expected to do the same and will have been provided with 'Train the Trainer' courses to enable them to do so.

### Partner info:

- Seven partner organisations are involved in Austria, Portugal, Spain, the UK, and Slovakia. Participants have included staff, Consultants and Volunteers from these partners, as well as many other organisations and individuals.
- The project has been funded by the European Community Horizon 2020 Program, with in-kind support from the partner organisations.
- The project was initiated by the Hofburg Palace in Austria and follows another successful EU-funded project known as MOD-IFY which provided heritage training for people managing historic sites. Analysis of the lack of understanding of energy saving measures for traditional buildings was undertaken for the bid and has been developed as a key unit within it by each partner country involved.

Image:

PRO-Heritage

## Case study

# Stainton Aqueduct - restoration

Canal & River Trust

Given the increase in severe rainstorms, the Canal & River Trust and other funders were keen that the Stainton Aqueduct would be restored in such a way that it would be resilient to similar damage in the future.

Stainton Aqueduct carries the Lancaster Canal across Stainton Beck at the village of Stainton in south Cumbria. In December 2015, the aqueduct was severely damaged following two storms, Desmond and Eva, causing the water levels in the beck to rise to extreme levels.



### Background

Stainton Aqueduct is a Grade II listed structure and was damaged in December 2015 following two extreme storm events – flood water washed away the upper towpath and apron, causing the partial collapse of the south portal. The Canal & River Trust made immediate remedial repairs to prevent further collapse and established a project to restore the aqueduct.

The Trust was assisted by funding from from The National Lottery Heritage Fund, Rural Development Programme for England: Cumbria Countryside Access Fund, South Lakeland District Council, Cumbria County Council and Kendal Town Council.

The damaged section of the south portal was taken down and supportive walls were built against the original wing-walls. Highly skilled stone masonry repairs were carried out to the arch barrel ceiling and decorative archway spandrel voussoirs stones-preserving the aqueduct's heritage significance and unique character whilst ensuring that the structure was repaired to the highest 21st century civil engineering standards.

Whilst the restoration was undertaken by a main contractor, the Trust's apprentice stone masons were given the opportunity to gain valuable masonry experience by assisting with the repair. The Canal & River Trust places value on learning from the past, on traditional skills and knowledge, champions and cultivates heritage skills including traditional maintenance and repair skills, and/or shares knowledge and forms partnerships to further develop skills knowledge base.

In addition to the restoration the Canal & River Trust established a community project that would engage the local community along the canal. The number of canal volunteers has increased; several working parties established; c 50 volunteers trained in dry stone walling skills; a heritage trail (including sculptures and interpretation) is about to be installed along the canal to engage and educate canal users.

Images:

Credit Canal & River Trust



## Case study

# St Marylebone Parish Church

Sir Robert McAlpine

St Marylebone Parish Church and the Building Crafts College have worked closely with Sir Robert McAlpine to facilitate an on-the-job craft training programme for several final-year masonry and carpentry students, providing those individuals experience and an opportunity to hone their trade, ensuring these skills are preserved in the future.

The refurbishment of the Grade I St Marylebone Changing Lives scheme is delivering one of London's most community-engaged heritage projects. With a focus on apprenticeships, Sir Robert McAlpine, a leading UK construction and civil engineering company, has facilitated employment for those starting out their heritage careers with an opportunity to hone their skills through practical application. This ensures traditional heritage skills are preserved, existing building stock can be reused, restored and repurposed, rather than demolished, having a positive impact on embodied carbon.

Sir Robert McAlpine is also facilitating craft open days as part of this project, both as a curriculum engagement activity for pupils and students, but also for local residents and the public. The days combine site visits and roof tours, specialist demonstrations and hands-on immersive practical sessions in relevant skills with our trades on site.

One of Sir Robert McAlpine's package managers on site, Sam Wilson, is a former apprentice and is also currently studying a degree in Historic Building Conservation with the Building Crafts College. His involvement allows the project to showcase how traditional skills can interface with modern methods of construction such as 3D modelling to the new generation of skilled tradespeople.

Along with other distinguished speakers, Sir Robert McAlpine has discussed at industry events and conferences what we need to do as an industry to make traditional craft skills for historic buildings more accessible, ensuring existing building stock is cared for and repurposed. It is important that we are living what we are saying on each one of our sites.

As part of our wider sustainability strategy, Sir Robert McAlpine has committed to achieving a level of Social Value Return on Investment (SROI) on all projects, demonstrating our commitment to making a difference to the individuals, society and communities in which we work.

In ensuring these traditional heritage skills are preserved, Sir Robert McAlpine is helping to ensure that that existing building stock can be reused, restored and repurposed, rather than demolished. This in turn should have a positive impact on embodied carbon emissions, where research has shown that demolishing a historic building and replacing it with a new building can result in greater carbon emissions by 2050.

The Social Value Return on Investment resulting from these engagements and activities is calculated through an independent third-party tool, with the output forming part of the project Socio-Economic and Environmental impact report at project completion.

Partial funding by the National Lottery Heritage Fund, along with strong links between St Marylebone Parish Church and the Building Crafts College, enabled positive early-stage engagement. This ensured the most suitable candidates from the College's carpentry and masonry students were able to be put forward to work on the project.

Our built historic environment forms an important part of our past, present and future. Historically the decisions to repair and maintain existing building stock have been focussed on their heritage and cultural significance, with the social and economic value being highlighted more recently. It is now becoming clear that the environmental value of these buildings, particularly in relation to carbon emissions, is key to meet the 2050 carbon emissions targets.

## Conclusion

This paper demonstrates how the heritage sector is taking positive action on climate change.

As a sector we must commit to do more and to change towards becoming sustainable and carbon neutral, to communicate the positive contribution we can make, to collaborate and share learning with each other, and invest in the skills and jobs we need to sustain our heritage into the future.

Heritage is part of the solution.

Read more on the [Heritage Responds Climate Change Story Map](#).

With thanks to all organisations, bodies and individuals who contributed case studies to the Heritage Responds project.

Thanks also to the members of the Historic Environment Forum COP26 Task Group including representatives from Historic England, Historic Buildings and Places, the Institute for Historic Building Conservation, the National Trust, Historic Houses, Church of England, English Heritage, the Institute of Conservation (Icon), the Architectural Heritage Fund, The Heritage Alliance, Natural England and the National Lottery Heritage Fund

Thanks to Historic England for creating the the Heritage Responds Climate Change Story Map on behalf of HEF. Thanks to MJT Design. Thanks to Historic England for funding, and to the Heritage Alliance for hosting the HEF COP26 Task Group Manager post.

Thanks to the HEF COP26 Task Group Chair, Rob Woodside (Estates Director, English Heritage), HEF COP26 Task Group Comms and PR support, Thomas Jones (Corporate PR Manager, English Heritage) and HEF COP26 Task Group Manager, Suzanne Huggett-Jones.

Image:

Sam Wilson





Produced by The Historic Environment Forum with a range of partners:



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