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A CLIMATE CHANGE & ENVIRONMENTAL ACTION PLAN 2019-2024

FOR HISTORIC ENVIRONMENT SCOTLAND

PURPOSE AND SCOPE

This is Historic Environment Scotland's (HES) five year Climate Change and Environmental Action Plan (CCEAP) 2019 to 2024. It sets out our approach to addressing the challenges and opportunities presented by climate change to our organisation and to the wider historic environment. Actions in this CCEAP are articulated under eight strategic themes that we have identified as core areas of climate change work and research.

The CCEAP details how we will work towards making our organisation and the broader historic environment more resilient to, and prepared for, changes in our climate, alongside playing a leading role in supporting the Scottish Government to meet its ambitious carbon emission reduction targets. It details how we will continue to build on our progress so far, to become an increasingly environmentally responsible organisation that places the environmental impact of our activities at the heart of our policy and strategy decision making processes. Our knowledge and experience will be used to engage with those throughout the wider historic environment, and to support the transformational change that will be necessary if society is to adapt to, and mitigate the causes of, climate change.

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CONTRIBUTORS

This document was prepared by Historic Environment Scotland's Climate Change Team.

1. INTRODUCTION

WHO WE ARE

Historic Environment Scotland (HES) is a non-departmental public body (NDPB) of the Scottish Government and a registered charity. Our vision is that the historic environment is cherished, understood, shared and enjoyed with pride, by everyone.

WHAT WE DO

- We care for 336 Properties in Care (PICs) on behalf of the Scottish Ministers. The general functions of managing the Properties in Care includes ensuring their conservation, articulating and safeguarding their cultural significance, providing public access for current and future generations, and managing the associated commercial operations.

- We look after internationally significant archives and artefacts.

- We protect our historic places through designations and consents, promote their sustainable development, and provide millions of pounds each year to local communities to repair and revitalise their historic environment.

- We provide advice and guidance about the historic environment, and offer a wide range of training and learning opportunities.

- We are at the forefront of investigating and researching the historic environment and addressing the impacts of climate change on its future.

2. CLIMATE CHANGE AND THE HISTORIC ENVIRONMENT

Scotland has a rich, diverse and extensive historic environment. There are more than 56,000 designated sites in Scotland, making up only 5% to 10% of all known historic sites (Historic Environment Scotland, 2016). Our own Properties in Care specifically, of which there are 336, span over 5000 years of Scotland's history. These sites range from iconic castles through to ruined abbeys, stone circles and internationally renowned Neolithic villages. Aside from the cultural and historical value, our historic environment makes a positive contribution to Scotland's economy, generating £4.2bn in 2017 alone. It supports 66,000 full time-equivalent jobs and in 2018 over 18 million people visited a historic attraction in Scotland, up from 16 million in 2016 (Historic Environment Scotland, 2018).

Looking after millennia of Scotland's history gives us a unique perspective of time. Scotland's climate is far from static; it has always been in a state of flux, and many historic sites retain evidence of changing environmental conditions. Some have harbours, yet are now hundreds of metres away from the present day shoreline. Others appear as islands on historic maps, but are now connected to the mainland

and accessible on foot. Many are built in areas susceptible to natural hazards such as flooding, yet demonstrate an in-built resilience to dealing with these hazards. In short, what we can learn from changes in the past may help prepare us better for the future.

Despite this, climate change as we know it today is pushing many of our properties, and the wider historic environment, into new and uncharted environmental conditions that they were not designed to cope with. The IPCC's Climate Change 2014 Synthesis Report Summary for Policymakers states that '*Warming of the climate system is unequivocal, and since the 1950s many of the observed changes are unprecedented over decades to millennia'*. The need for urgent action was highlighted in the IPCC's 'Global Warming of 1.5^{O}C' special report, published in October 2018, which warned that without immediate mitigating action unprecedented human induced global warming will have catastrophic consequences across the globe by the second half of this century. In Scotland the historic environment is on the frontline of climate change, and it has a role to play in helping Scotland adapt and meet highly ambitious national climate change targets.

We have an opportunity to stimulate thinking about the impacts of climate change on Scotland's cultural heritage and beyond by utilising our position as the lead public body in Scotland for the Historic Environment. The historic environment is visible throughout all of Scotland, and as demonstrated by the numbers of visitors to historic sites, there is a growing audience that actively seeks us out. This platform provides us with a unique opportunity to lead by example, demonstrate what meaningful climate action looks like and encourage others to achieve the same, both at home here in Scotland and on an international stage. The 2019 report 'Cultural Rights: Tenth Anniversary Report' by the United Nations Special Rapporteur in the Field of Cultural Rights, states '*(a) that the impact of climate change on cultural heritage is an urgent human rights question and must be understood and responded to as such and (b) that cultural heritage in all its forms represents a powerful resource for addressing the challenges caused by climate change'.*

2.1 LEGISLATION AND POLICY

As a lead public body in Scotland we have a strong legislative foundation from which we have planned an informed and pragmatic approach to tackling climate change. The primary driver is *The Climate Change (Scotland) Act 2009* (Scottish Parliament, 2009); this places duties on public bodies to contribute to emission reduction targets, deliver programmes for adaptation, to increase resilience, and to act in a sustainable way. We are identified as a 'Major Player' under the Act, due to our size and influence. Guidance clarifying these duties, *Public Bodies Climate Change Duties: Putting them into Practice* was published in 2011 (Scottish Government, 2011). Sitting underneath this are numerous, more focused, statutory drivers summarised in Table 1.

In 2018 the Scottish Government published its third *Climate Change Plan* (Scottish Government, 2018) that sets out how Scotland can deliver its interim target of a 66% emissions reductions target for the period 2018–2032. In this plan, further

expectations are placed on the public sector to '*increasingly demonstrate how its own (the sector) operations are driving down emissions*'.

In May 2018 a new Climate Change (Emissions Reduction Targets) (Scotland) Bill was introduced to the Scottish Parliament. The Bill proposes to amend the Climate Change (Scotland) Act 2009 and immediately increase Scotland's emission reduction target to 90% by 2050. Setting a 90% reduction target for all greenhouse gases would mean net-zero emissions of carbon dioxide by 2050 – in other words, Scotland would be carbon neutral.

In March 2014 the first ever Historic Environment Strategy for Scotland was launched, Our Place in Time (OPIT). The Strategy sets out a common vision and ambition about how we will care collectively for the historic environment over a ten year period, including how both individuals and organisations can continue to work together to help ensure that the historic environment is in a position to deal with the challenges it currently faces such as climate change. We have responsibility for reporting progress of delivery for the strategic priorities and for coordinating and enabling the OPIT working groups, one of which is the Climate Change group. The Climate Change group activity and outputs contribute directly to the achievement of OPIT KPI 2, improve the environment by reducing CO_2 emissions, and also supports achievement of other OPIT priorities and indicators relating to informed decision-making, skills and capacity, and accessible knowledge (KPIs 3, 5, and 9).

In 2012 Historic Scotland (HS) published its first five year *Climate Change Action Pl*an (HS CCAP). This plan was adopted by Historic Environment Scotland after the merger of Historic Scotland with the Royal Commission on the Ancient and Historical Monuments of Scotland (RCAHMS) in 2015. This plan set out HS's approach to address the challenges and opportunities presented to the organisation by climate change. Progress made during the duration of this last HS CCAP cycle is summarised in each of the eight new themes identified in this document. Other notable drivers that have led us to where we are today are summarised in Table 1.

Our continued commitment to addressing the impacts of climate change on the historic environment formed a central theme of our first Corporate Plan 2016-19, *For all our Futures*. Within this plan are dedicated key performance indicators that have allowed us to measure our progress with respect to tackling climate change. We summarise our progress in annual *Sustainability Reports* that are published alongside our *Annual Report and Accounts*. We also report publically on progress through submission of an annual *Public Bodies Climate Change Duties Report*, as required by Scottish Government.

Understanding the impacts of climate change on our organisation, and taking action to limit these impacts will continue to form a central theme of our next corporate plan, due to be published in 2019.

INTERNATIONAL DRIVERS					
The Paris Agreement			Sustainable Development Goals		
NATIONAL DRIVERS					
The Climate Change Act (Scotland) 2009	Climate Change Plan - Third Report On Proposals And Policies 2018-2032	Our Place In Time (2014 to 2024)	The Historic Environment (Scotland) Act 2014	Climate Change (Duties of Public Bodies: Reporting Requirements) (Scotland) Order 2015	Scotland's National Performance Framework
INTERNAL DRIVERS					
Historic Environment Scotland Corporate Plan 2016-19, For all our Futures (new plan launching 2019).					

CLIMATE CHANGE AND ENVIRONMENTAL ACTION PLAN THEMES		
THEME	**HES POLICY AND STRATEGY**	**SELECT ADDITIONAL NATIONAL DRIVERS**
Carbon Management	• HES Carbon Management Plan (2015-20)	• Scottish Government's RPP2 (Low Carbon Scotland – Meeting our Emissions Reduction Targets 2013-2027). • Scottish Government's Conserve and Save: Energy Efficiency Action Plan (published 2010).
Sustainable Travel	• HES Carbon Management Plan (2015-20) • HES Business Travel Policy	• Public Bodies Duties
Circular Economy	• Litter Prevention Action Plan 2018 • Waste Prevention and Reuse Plan 2013 • HES Carbon Management Plan (2015-20)	• Waste (Scotland) Regulations 2012 • Scotland's Zero Waste Plan 2010 • Making Things Last - A Circular Economy Strategy for Scotland
Biodiversity	• HES Biodiversity Policy (in draft) • Biodiversity Delivery Statement 2018	• 2020 Challenge For Scotland's Biodiversity – A Strategy for the Conservation and Enhancement of Biodiversity in Scotland. • The Wildlife and Natural Environment (Scotland) Act 2011 (WANE Act)
Climate Impacts, Risk and Adaptation	• HES Adaptation Plan (to be developed late 2019).	• Climate Ready Scotland: Scottish Climate Change Adaptation Programme
Behaviour Change	• Green Champions Network	• Public Bodies Duties
Research, Education and Training	• Traditional Building Skills: A strategy for sustaining and developing traditional building skills in Scotland (2011)	• Scotland's Energy Efficiency Action Plan • Climate Ready Scotland: Scottish Climate Change Adaptation Programme
Sustainable Procurement	• HES Sustainable Procurement Guidelines 2015	• Procurement Reform (Scotland) Act 2014 • Scottish Sustainable Procurement Action Plan

Table 1: Summary of international, national and internal legislative drivers guiding our work.

2.2 THE SCIENCE

The data is clear, our climate is changing and doing so at an unprecedented rate. In the most recent State of the UK Climate report, published in 2018, data compiled by the Met Office detailed how all of the 10 warmest years on record in the UK have occurred since 2002. The most recent decade (2008 to 2017) has been on average 0.8 °C warmer than the 1961–1990 average (Kendon et al, 2018).

Average rainfall totals for the UK have continued to increase over recent decades, particularly over Scotland. The most recent decade (2008–2017) has been on average 4% wetter than the 1981–2010 average and 11% wetter than the 1961–1990 average. UK summers for the most recent decade (2008–2017) have been on average 17% wetter than 1981–2010 and 20% wetter than 1961–1990, with only summer 2013 drier than average (Kendon et al, 2018).

In November 2018 the Met Office published a report detailing the change in weather extremes observed in the UK. The report compared temperature and precipitation data for the most recent year (2017) to the most recent decade (2008-2017) and the standard reference climatology periods of 1981-2010 and 1961-1990. Headline findings from this report include:

- The average hottest day of the year has increased by 0.8 °C
- Warm spells have more than doubled in length, increasing from 5.3 days in 1961 - 90 to 13.2 days in 2008 – 2017
- Total rainfall recorded on extremely wet days has increased by around 17% in 2008 - 2017 in comparison to 1961 - 1990. For the west of Scotland specifically, this figure is 36%.

Scottish tidal records show that over the past 20 years relative sea-levels around Scotland have been increasing on average by 3 mm/yr. This is faster than the 20th century average for the British Isles, which is 1.4 mm/yr. A recent study has shown that since the 1970s erosion rate on Scotland's soft coast (19% of the total) has nearly doubled to 1.0 m/yr, in comparison to rates measured between the 1890s and 1970s. In the same time period there has been a 39% increase in the amount of soft coast experiencing erosion and a 22% decrease in the amount of soft coast accreting (Hansom et al, 2017).

Moving forward, the Met Office UKCP18 data published in November 2018 show that these changes in our climate will accelerate, with winters becoming warmer and wetter, and hotter summers with changing patterns and intensities of rainfall. By the 2050's Scotland could see summer temperatures increased by 4-5 degrees Celsius, with 40-60% more winter rainfall in places if no action is taken to reduce carbon emissions. Weather extremes are predicted to become increasingly the norm. Rates of sea-level rise are predicted to increase at an accelerated rate, with a global sea

level increase of between 0.56 - 1.12 metres by 2100 under a high emissions scenario (UKCP18, 2018).

2.3 OUR ENVIRONMENTAL AND SOCIAL RESPONSIBILITY

Although there are important legislative drivers that influence the work we do, we recognise that climate change is an issue that transcends political agendas, and is one that requires action, regardless of these statutory requirements. In our next corporate plan, five outcomes have been set that help focus our vision as an organisation. Achieving meaningful, and beneficial climate action will play a core role in helping us to attain our overall vision for Scotland's historic environment. The five outcomes are:

- Outcome 1: The historic environment makes a real difference to people's lives
- Outcome 2: The historic environment is looked after, protected and managed for the generations to come
- Outcome 3: The historic environment makes a broader contribution to the economy of Scotland and its people
- Outcome 4: The historic environment inspires a creative and vibrant Scotland
- Outcome 5: The historic environment is cared for and championed by a high-performing organisation

Populations expected to be impacted the greatest by climate change are often those already from disadvantaged and vulnerable backgrounds. Local communities dependent on agricultural or coastal livelihoods are also at heightened risk of the impacts of climate change (IPCC, 2018). Due to the national remit of our operations, we often have a presence in these communities, and as such it is important that we lead by example and that we take responsibility to reduce our environmental impact in Scotland by acting in an increasingly sustainable manner. We recognise that the approaches we develop to combating the causes and impacts of climate change must be adaptable themselves, so they can be used by, and in, local communities throughout Scotland.

The wider scale and severity of the effects of climate change has been highlighted during the UN Conference of the Parties (COP24) meeting in Poland in December 2018. At the meeting the UN refugee agency (UNHCR) stated that there could be 250 million people displaced by climate change by 2050. It is clearly important to recognise the scale of this issue internationally, and the potential extent of climate-related disruption, and to consider the implications for Scotland and the UK economically and politically and the role that cultural heritage might have to play in a world of shifting priorities. Scotland will be affected by climate change both directly through physical impacts of weather etc., and indirectly through economic and political changes that are likely to occur during the present century.

2.4 THE FINANCIAL CASE

Many of the objectives set out in this new plan make clear financial sense, either in that they offer the opportunity to reduce costs such as our energy bills, or in that they act to reduce the financial impact when our business operations are impacted by extreme weather events.

Due to the nature of our business at Historic Environment Scotland, our day to day operations are particularly sensitive and vulnerable to the disruption that can be caused by extreme and unpredictable and unseasonal weather events. For example in 2018, Storm Hector (13 June) and Storm Ali (19 Sept) were notable as unusually severe storms for the time of year, bringing close to record-breaking wind gusts for June, and one of the most notable September storms in recent decades, respectively. HES lost approximately 11,000 visitors due to site closures as a result of Storm Hector.

The weather does not necessarily have to be extreme in nature in order to have a negative impact on our business. Relatively small changes in temperature, rainfall, sunshine, snowfall and wind levels can result in disruption at any number of the sites we are responsible for across the country, and can have a negative impact on the ongoing conservation and maintenance of our Properties in Care. Climate change is now aggravating naturally occurring variability in our climate and will increasingly become a source of uncertainty with respect to business continuity. By improving our resilience against changes in our climate we can limit the physical and financial consequences of extreme weather events as they become increasingly common, as well as limiting the effects of gradual changes in our climate.

We also stand to make financial savings by becoming an increasingly sustainable organisation. The work we have already carried out at Edinburgh Castle is a good example of this. An investment of approximately £481,907 in climate change upgrades and improvements since 2008-09 to 2017-18 has resulted in our total energy usage reducing by 30% and a reduction of 40% in associated emissions. This has resulted in a cumulative financial saving of £782,357 giving a payback time of approximately 5 years and an overall saving of £300,450 since payback. The principles applied at Edinburgh Castle could be replicated at many additional PICs, as well as in the wider historic environment.

2.5 MEASURING PROGRESS

Actions in this CCEAP are articulated under eight strategic themes that have been identified as core areas of climate change work and research for HES. Progress will be monitored and measured via a newly created Climate Change and Environmental Action Plan Governance Board, to be chaired by the Chief Executive. The ambitions of the CCEAP will be reflected in our Corporate Plan and Annual Operating Plan and progress monitored and measured via key performance targets. Annual updates on

progress will be published in our annual Sustainability Report, as an annex to the Annual Report and Accounts and in the mandatory annual Public Bodies Climate Change Duties Report, submitted via the Scottish Government portal. Detailed reporting on our Biodiversity activity is via the mandatory Biodiversity Report, which is published every three years. The next report is due 2020.

3. THEMES AND ACTIONS

The following sections (3.1 to 3.8) detail the eight strategic themes we have identified that form the basis of our work and research over the next five years. Each theme describes what it is, summarises progress we have made to date, what our ambition is for the organisation going forward, and a series of actions and objectives that we believe will allow us to achieve these ambitions. Each theme is supported by a short case study based on positive stories and actions achieved as part of the last HS CCAP cycle (2012 to 2017). The actions and objectives contained in the following section are not only intended to transform our own organisation, it is our intention to foster change throughout the wider historic environment sector, and further. Central to achieving this will be working closely with key external partners and stakeholders and importantly inspiring and supporting action by members of the public and local communities.

We will, where relevant, undertake environmental assessment of our plans, policies, programmes and strategies associated with this new Climate Change and Environmental Action Plan in accordance with the Environmental Assessment (Scotland) Act 2005.

3.1 CLIMATE IMPACTS, RISK AND ADAPTATION

3.1.1 DEFINITION

The Intergovernmental Panel on Climate Change (IPCC) defines climate change adaptation as ‘adjustments in natural or human systems in response to actual or expected climatic stimuli or their effects, which moderates harm or exploits beneficial opportunities’. For us at Historic Environment Scotland this means we need to know what the risks associated with climate change are, so that we understand what the impact of these changes will be, and assess what we can do to increase resilience and support adaptation in the historic environment.

The nature of our business makes us particularly sensitive to disruption that can be caused by extreme weather events, and the location and nature of many of our properties makes them particularly vulnerable. Work is required to better understand the effect of both long term gradual environmental change on heritage assets, as well as the impact of increasing frequency and severity of extreme weather events. The foresight developed by increasing our understanding of what is changing and what the risks might be will allow us to increase our resilience in a much more informed and pragmatic way. We also have a role in disseminating advice and guidance to others to facilitate increasing climate resilience across the public sector and the historic environment.

3.1.2 PROGRESS TO DATE

Since 2012 we have been developing a methodology for assessing natural hazard risk on heritage assets and undertaken and published the initial phase of a climate change risk assessment on our PICs, by working in close partnership with the British Geological Survey and the Scottish Environment Protection Agency. We have undertaken and supported research focused on understanding the physical impacts of climate change on the historic environment, including understanding changing patterns and intensity of wind-driven rain, and the impact this has on moisture in buildings and the deterioration of stonework. We have carried out research and published case studies and guidance on the adaptation of traditional buildings, including a Short Guide specifically on climate change adaptation and an INFORM guide on flooding, both aimed at homeowners and property managers.

Complementing this, we have supported the wider sector by holding positions on the steering groups for: Dynamic Coast: Scotland’s National Coastal Change Assessment, Edinburgh Adapts, Adaptation Scotland, Sustainable Scotland Network, Fit for the Future Adaptation Group (UK), Historic Environment Adaptation Working Group (UK), and the International Climate Heritage Network. We had a significant role in developing and delivering the Scottish Government’s first Scottish Climate Change Adaption Programme (SCCAP) 2014, and are on the Advisory Panel for the creation of the second SCCAP to be published in 2019. We also sat on an Adaptation Scotland expert working group to help shape new public sector guidance on climate change adaptation, due to be launched later in 2019.

3.1.3 AMBITION GOING FORWARD

In this CCEAP we are setting out an ambitious programme of works over the next five years to increase our organisation's resilience to climate change. Key deliverables from this programme of works include the delivery of an Adaptation Plan for our organisation and a continued commitment to using our 'lessons learnt' to better equip the heritage sector, and beyond, with advice and guidance on how climate resilience can be best achieved. We will use our platform as a leading public body in Scotland to stimulate discussion and support action that helps promote the benefits of meaningful climate change adaptation to a global audience.

CASE STUDY: CLIMATE CHANGE RISK ASSESSMENT

In 2018 Historic Environment Scotland published the initial results of our Climate Change Risk Assessment. This phase of the project is a desk based assessment of the current environmental risk on the 336 Properties in Care. By understanding the current risk from natural hazards to our diverse properties, we have been able to identify the sites we believe to be most at risk from future climate change. With this new data we are in a much stronger position to prioritise ongoing maintenance and conversation work that can help to increase the resilience of these sites.

Core to the successful delivery of this project was working in partnership with other public sector organisations, primarily the British Geological Survey (BGS) and the Scottish Environment Protection Agency (SEPA). Both BGS and SEPA provided natural hazard datasets that were used in the project, as well as assistance and guidance in using the datasets appropriately and making sure they were communicated correctly. SEPA provided their datasets under "Action on Climate Change", a joint statement between HES, SEPA, Forestry Commission Scotland and Scottish Natural Heritage on our shared responsibilities around climate change.

During the development of our risk assessment, we were part of Adaptation Scotland's 'Adaptation Learning Exchange Risk Task Group'. The group brings together a range of public sector organisations including Scottish Water and Aberdeen City Council, to support one another during the risk assessment process. This allowed us to sense check our approach at various stages throughout the process, and to learn from others in the wider public sector. In short, our entire project has been shaped by working in partnership with public sector partners.

3.1.4 ACTIONS

#	YEAR	ACTION	INTERNAL BENEFIT	WIDER BENEFIT
1	1	Develop and publish a Climate Change Adaptation Plan for the organisation.	Creation and implementation of an adaptation plan will result in long-term resilience, risk reduction and financial savings for the organisation as a result of having a business prepared to effectively manage current and future climate risks.	Supporting the historic environment sector, by providing leadership and acting as an exemplar.
2	Ongoing	Continue to monitor climate change impacts through digital documentation for the Rae Project and expand this activity where resource allows.	Continual monitoring of sites such as Skara Brae allows us to document physical changes in the landscapes in which the property is situated, as well as changes in the property itself. This allows for improved confidence and efficiency in monitoring PICs at risk from climate change and creation of quantitative data to make informed strategic decisions on conservation.	The work being carried out as part of the Rae Project and the data collected can also contribute to larger external projects such as Dynamic Coast: Scotland's National Coastal Change Assessment, of which we are a key partner.
3	Ongoing	Develop our Climate Change Risk Assessment (CCRA) methodology.	Further development of the CCRA will see the incorporation of new UKCP18 climate change projections and continuation of partnership working with BGS and SEPA to refine the existing results. This will create a more strategically beneficial dataset with regards to prioritising investment and conservation.	Supporting the historic environment sector by providing leadership and acting as an exemplar. A crucial element to this will be articulating results and methodologies to the general public and local communities in such a way that increases understanding of the risks associated within their own communities and supports action to tackle impacts.
4	2 & 4	Formally review and update the Climate Change Risk Register	Periodic review of the results will help ensure they accurately reflect the risk at each of our PICs, and allows us to	

#	YEAR	ACTION	INTERNAL BENEFIT	WIDER BENEFIT
		for the Properties in Care every two years.	incorporate new datasets / information that might be released over the next five years.	
5	Ongoing	We will work to better understand the physical impacts of climate change on our collections, and how this will influence our approach to managing them long-term.	There is an opportunity to conduct ground breaking research into the management of collections in the face of a changing climate, including the micro and macro scale impacts of climate change on the collections themselves. This would allow us to safeguard our collections for future generations.	Dissemination of research and associated results would be of great benefit to the wider heritage and museums sectors.
6	2	We will update the investment prioritisation matrix to formally mainstream the climate change risk assessment results into the decision making process.	Incorporating climate change risk into our investment prioritisation process helps us to protect vulnerable sites by taking action before it is too late. Periodically refreshing this data will help us understand changes in risk levels at our sites, ensure that our investment choices take cognisance of these changes and allow us to prioritise our work accordingly.	Leading by example and incorporating climate change risk into investment prioritisation matrix may influence others to do the same, therefore increasing climate change resilience in sectors beyond our own.
7	Ongoing	We will continue to support the wider sector by increasing knowledge and understanding, and reviewing and updating existing guidance on climate change adaptation.	Revision of existing and publication of new advice and guidance on climate change and wider sustainability issues (including Managing Change guidance, Short Guides, INFORM leaflets, Technical Papers, Refurbishment Case Studies).	Continue to disseminate information and guidance to the wider sector and further. To conduct new research and publish the results, as well as positioning ourselves as a primary resource for climate change adaptation guidance and information.

#	YEAR	ACTION	INTERNAL BENEFIT	WIDER BENEFIT
8	Ongoing	We will work to establish where climate change resilience measures could be factored into the HES Grants and Funding process.	By including climate change associated actions within, or alongside our Grants process (including Building Repair Grants, Conservation Area Regeneration Scheme and City Heritage Trusts) we can support the wider sector in increasing resilience of the historic environment throughout Scotland; including energy efficiency and circular economy/waste reduction.	
9	Ongoing	We will continue to work with key external stakeholders and partners, such as SCAPE, to further develop our understanding of climate change impacts on the historic environment, and to make sure our cultural heritage is acknowledged as a resource that can help achieve meaningful climate action.	Developing our understanding of climate change impacts on the historic environment, and building stronger ties with key external stakeholders will allow us to demonstrate the relevance of our cultural heritage on a local to global scale. This can be achieved through our involvement in networks such as the Climate Heritage Network, Historic Environment Adaptation Working Group and the Fit for the Future Climate Change Adaptation Group.	This will allow us to support other organisations through sharing our own knowledge and expertise, as well as allowing us to learn from others. These groups also provide us with a platform through which we can share resources and data, which overall results in increased climate resilience internally at HES, and throughout the sector more generally. We can also advise and contribute to government policy making (e.g. representing NDPBs on steering group for the Scottish Government's new Climate Change Adaptation Programme).

3.2 ENERGY & CARBON MANAGEMENT

3.2.1 DEFINITION

Carbon management is the means through which we reduce Greenhouse Gas (GHG) emissions from our business operations to mitigate the causes of climate change. Our business operations are numerous, covering a wide range of emissions sources including energy consumption (gas, electricity and other fuels); business travel, waste and water. Carbon management seeks to better understand, monitor and record these sources in order to reduce consumption and improve practices and business operations overall. Managing our emissions is essential to HES as it helps us set emission reduction targets that align with those set by Scottish Government, reduces our environmental impact and realises cost savings. It also helps us fulfil our role as a leader and exemplar in climate change mitigation.

3.2.2 PROGRESS TO DATE

Our second Carbon Management Plan (CMP) was published in March 2017. It aligns our carbon reduction targets with the long-term national targets, setting a total 'carbon budget' for the entire target period (to 2050). This requires annual reductions of between 2.2 - 2.4%, and an overall reduction of 11% over the first five-year period (to 2020). Each year we have successfully exceeded our emission reduction target from 2014-15 to 2017-18.

We have continued to improve energy monitoring/measuring systems through installation of new/ improved Automatic Meter Reads (AMRs), sub-meters and reviewing of energy efficiency measures. This has included the monitoring and targeting of problem AMR meters to fill in gaps for estimated bills. Doing so has improved engagement with operational staff, improved the accuracy of energy data and facilitated action at various sites, meaning that energy reporting has significantly improved.

We have improved engagement with staff and other site users through the establishment of Energy Focus Groups for our main energy consuming sites. This is supported by the continued updating and analysis of their energy consumption and carbon emissions data. Directorate and cost code data for Business Travel emissions reporting has been improved, enabling a pilot in which the Heritage Directorate sets targets to reduce Business Travel from staff.

3.2.3 AMBITION GOING FORWARD

We aim to build upon previous successes and meet or exceed targets and objectives set out in our CMP, and set more advanced targets that consider actual consumption. We will strive to integrate carbon management into all HES business areas with all staff contributing to emission reductions. We want the historic environment to be seen as part of the solution, and not the problem.

CASE STUDY: EDINBURGH CASTLE ENERGY EFFICIENCY IMPROVEMENTS

Edinburgh Castle is the largest energy user in Historic Environment Scotland's estate, totalling 4,807,631 kWh (kilowatt hours of energy) in 2017-18, and accounting for 27% of our total energy consumption. This is equivalent to 348 average UK households and 1155 tonnes of carbon dioxide (tCO_2e Green House Gas Emissions) each year. Edinburgh Castle is a large and complex site made up of around 27 separate buildings over 2.8 hectares of land. It is a part of the Old and New Towns of Edinburgh World Heritage Site and a Scheduled Monument, meaning that any energy efficiency improvements need to be carried out in a way that respect the historic fabric and retain the unique cultural significance of this iconic place.

A range of energy reduction measures have been carried out through staff engagement and physical fabric and systems improvements. Staff engagement measures include (but not limited to): Climate Change awareness training; staff good practice and toolbox talks on energy efficiency; an expanding HES Green Champions network and regular Energy Focus Group giving dialogue between HES and other occupants at site. Physical fabric and systems improvements carried out include (but not limited to): Heating systems and controls upgrades and replacements; LED lighting improvements; Building Management Systems (BMS) upgrades; Loft Insulation; Draught proofing; Sub-meter improvements and secondary glazing installations.

Substantial energy and carbon savings have been made from an investment of approximately £481,907 in energy efficiency measures from 2008-09 to 2017-18. We have managed to reduce our total energy use by 30% and our associated emissions by 40%. This has resulted in a cumulative energy saving of £782,357 with a payback period of approximately 5 years and a continued saving of £300,450 since. All this has been achieved whilst welcoming an increasing number of visitors over the same time period, reaching a new high of 2 million visitors in 2017-18.

3.2.4 ACTIONS

#	YEAR	ACTION	INTERNAL BENEFIT	WIDER BENEFIT
1	Ongoing	We will follow the strategy laid out in our Carbon Management Plan (CMP) 2020 which details actions to reduce energy consumption, improve data monitoring and reporting.	Mainstreaming carbon management across our organisation will result in increased resource efficiency, and continued cost savings.	Supporting the historic environment sector and, by providing leadership and acting as an exemplar, as well as contributing to national emissions targets.
2	2	We will work with internal and external stakeholders to enhance communication of our CMP including, but not limited to, energy and emissions figures.	Improved communications will increase staff engagement and support HES in meeting emissions reduction targets.	By improving the way we communicate our CMP, we will support the historic environment sector and communities, by providing leadership and acting as an exemplar.
3	Ongoing	We will improve upon existing data monitoring, targeting and retrieval methods and technologies from Automatic Meter Read (AMR) electricity utility meters.	Improved monitoring, recording and reporting, leading to improvements in accountability and ongoing emissions and cost savings.	Improved ability to contribute to national emissions targets for Scotland. Reporting to Scottish Government and the public through our Public Bodies Climate Change Duties Report will be more accurate.
4	5	We will devolve responsibility to HES directorates and business areas where possible, for meeting targets and behaviour change relating to operational emissions	Increased accountability and staff engagement leading to continued emissions and cost savings.	Supporting the historic environment sector, by providing leadership and acting as an exemplar. Contributing to meeting national emissions targets.
5	Ongoing	We will ensure that energy & carbon management objectives are mainstreamed within strategic and operational	Continued emissions and cost savings.	Supporting the historic environment sector, by providing leadership and acting as an exemplar.

#	YEAR	ACTION	INTERNAL BENEFIT	WIDER BENEFIT
		decision making across the organisation.		Contributing to meeting national emissions targets.
6	Ongoing	We will continue to develop and empower Green Champions across the organisation through a series of energy, carbon reduction initiatives and training opportunities where appropriate.	A culture of climate change action and sustainability will continue to develop as the network grows, further embedding low carbon behaviours in staff over time. Continued emissions and cost savings.	Supporting the historic environment sector, by providing leadership and acting as an exemplar. Contributing directly and indirectly to meeting national emissions targets.
7	1 - 5	We will roll-out energy walkthroughs and audits – where required - to improve understanding of sites and subsequent decision making for interventions – including behaviour change, technology and fabric measures.	Better understand our building assets including how the building is used, stakeholder behaviours and potential technology or fabric improvements that could improve energy and emissions performance and achieve cost savings.	Supporting the historic environment sector, by providing leadership and acting as an exemplar. Contributing to meeting national emissions targets.
8	1 - 5	We will work with internal and external partners and stakeholders to better quantify emissions and cost payback savings of current and future climate change projects.	Figures for emissions and costs payback are more accurate. Projects reported to Scottish Government display an organisational understanding of project savings, either by single interventions or groups of interventions per site. Can provide better detail into developing projects for buildings, ensuring that project plans are smarter going forward.	Improve upon existing partnerships and knowledge sharing with relevant organisations. Help better meet national climate change targets and use what we have learned to inform and inspire other organisations and the wider public.
		Continue to improve energy reduction at sites through the	Continued emissions and cost savings, in line with CMP.	Supporting the historic environment sector, by providing leadership and acting

#	YEAR	ACTION	INTERNAL BENEFIT	WIDER BENEFIT
9	1-5; Ongoing	installation of low energy systems (e.g. lighting and heating), improved controls, and insulation measures. Where appropriate renewable energy systems will be installed.		as an exemplar. Provision of case studies to support wider change. Sector contribution to meeting national emissions targets.

3.3 SUSTAINABLE TRAVEL

3.3.1 DEFINITION

Sustainable transport refers to the promotion and implementation of low/no carbon modes of transport for business travel and commuting. This focus area aims to reduce our emissions from staff business travel and fleet, whilst also contributing to reductions in air pollution, noise pollution and congestion. Additional benefits include promoting healthy lifestyles and staff well-being. It also aims to ensure more effective use of the Sustainable Business Travel Hierarchy, providing more sustainable travel options and alternatives to travel, promoting active travel and improving the collection and analysis of carbon emissions data from business travel.

Transport accounts for 27% of Scotland's emissions, and 73% of this is from road transport. The Scottish Government's Climate Change Plan: third report on proposals and policies 2018-2032 (RPP3) (Scottish Government, 2018) announced that all new petrol and diesel cars and vans will be phased out by 2032. Scotland's cities will introduce low emissions zones, the first of which came into effect in Glasgow in December 2018. The decarbonisation of road transport will mean HES will need to consider use of our vehicles and fleet, and visitor travel to our sites. Positive action in this area will reduce our own emissions and support national targets, and ensure that visitors to our sites have sustainable transport options.

3.3.2 PROGRESS TO DATE

HES has implemented a fleet management service in collaboration with Scottish Natural Heritage (SNH). This has allowed us to monitor pool car usage and gather data on driving and emissions from business travel. In 2015 we published our Business Travel Policy which provides a Travel Hierarchy to assist staff in choosing the most sustainable travel option. Over the last five years we have organized staff engagement activities to encourage more sustainable business and commuter travel, including participating in the Scottish Workplace Journey Challenge; Electric Vehicle (EV) driver training; promoting cycling through Bike Week; bike maintenance workshops; 'Bike Breakfasts' and fuel efficient driver training.

Since 2013 we have expanded our 'green fleet' and installed EV charge points at our head offices. Furthermore, in 2017 we joined CycleScheme to encourage staff to purchase bicycles for their commute.

A total of 6 HES offices and sites have received a Cycle Friendly Employer (CFE) award in a bid to increase Sustainable Travel alternatives to staff by actively improving cycling facilities (including bike racks and showers, etc.), offering a cycle allowance scheme, cycle training and campaigns for staff.

In 2017 we launched a pool bike pilot for our Edinburgh offices. Feedback has been

positive, with requests from other sites for improved cycle infrastructure and electric pool bikes. Pool bikes are now considered fleet and form part of a new fleet booking system that takes into consideration the Travel Hierarchy.

3.3.3 AMBITION GOING FORWARD

We aim to be an organisation in which staff are able to work flexibly (including home working) and are supported to make low-carbon commutes that keep them healthy and productive. We want to promote active travel to staff and visitors to support Scottish Government's Active Travel Plan. We will invest in EVs and EV charging infrastructure, promoting their use to staff and visitors. We will manage our business travel in a transparent way through devolved carbon budgets to business areas. Staff will be incentivised to adopt sustainable travel methods, as well as seeking alternatives to travel, such as improved IT communications.

CASE STUDY: INTRODUCTION OF A POOL BIKE FLEET

To help deliver on actions set out in our Carbon Management Plan (CMP), Business Travel Policy and Cycle Friendly Employer (CFE) certification, we successfully launched our Pool Bike pilot Scheme in May 2017 that provided pool bikes to Edinburgh based staff. This was intended to reduce business travel emissions and to improve health and wellbeing of staff. The scheme was also used to promote our 'Travel Hierarchy', which states that to avoid unnecessary fossil fuel use in vehicles such as taxis, where possible "meetings must be set within, or be moved to within, walking or cycling distance".

The pilot used ex-Royal Mail bikes (Pashley Mailstars) which were refurbished and rebranded as 'Elephant Bikes'. Elephant Bikes is part of a charity that refurbishes ex-postal bikes, and for every bike purchased another is sent to Malawi where social ventures help to create training opportunities and meaningful jobs.

Since their implementation in 2017, our Edinburgh pool bikes have travelled a total of 161 miles and saved a total of 43kg CO_2 by replacing vehicle and taxi use in the city. Feedback from our pool bike survey and accompanying report has been positive, leading to additional requests to increase and expand our pool bike fleet to other sites in Stirling and Edinburgh. The results from this pilot have led to the successful application of grant funding for both improved cycle infrastructure and electric pool bikes to expand the pool fleet beyond Edinburgh.

3.3.4 ACTIONS

#	YEAR	ACTION	INTERNAL BENEFIT	WIDER BENEFIT
1	2	Develop and Implement a new Sustainable Travel Policy & Strategy.	Set targets of improvement for all business travel activities and infrastructure across the organisation, facilitating organisational change and embedding a sustainable travel culture that achieves cost savings and contributes to emissions reduction targets.	Supporting the historic environment sector, by providing leadership and acting as an exemplar. Contribution to meeting national sustainable travel and emissions targets.
2	Ongoing	Improve quality of existing business travel usage data.	Improved accountability within the Carbon Management Plan, contributing to meeting emissions reduction targets.	Improved accuracy on reporting business travel emissions to Scottish Government and the public through our Public Bodies Climate Change Duties Report. Contribution to meeting national emissions targets.
3	Ongoing	Improving IT systems to increase alternatives to travel, through remote access video links, agile and home working.	Reduced emissions relating to business travel, therefore meeting and exceeding targets emissions reduction targets.	Improved delivery of business travel emissions to help deliver on national emissions targets for Scotland.
4	Ongoing	Increase and improve upon existing EV Charge infrastructure for staff and	Prepare HES for transition to low/no carbon modes of transport.	Setting tangible targets under the Sustainable Travel Policy & Strategy will help meet targets set out by the Climate Change

#	YEAR	ACTION	INTERNAL BENEFIT	WIDER BENEFIT
		visitors across the organisation.	Providing EV charge points for sites (where feasible) will provide better access options to visitors, potentially increasing revenue at these sites.	Plan (RPP3) and provide exemplar of successful shift in a large organisation Inspire both the public and other organisations towards stopping all fossil fuel vehicles by 2032.
5	Ongoing	Increase EV Fleet across the organisation.	This will reduce emissions associated with the use of HES pool fleet for business travel. Increasing our EV fleet will help deliver on emission targets set by our Carbon Management Pan (CMP).	Will help meet national targets set out by the Climate Change Plan (RPP3) The Scottish Government's plan for a comprehensive system of EV charge points across Scotland (see Switched on Scotland 2017) will allow EV access to more HES sites.
6	1-5	Expand Cycle Friendly Employer (CFE) assessments to more sites.	Improvements to be carried out to sites, providing the necessary infrastructure to facilitate change across the organisation – further influencing a sustainable travel culture and therefore a move away from Internal Combustion Vehicles. Costs relating to taxi, hire car, grey fleet and HES fleet could be reduced. Health & Wellbeing of staff improved by helping with the transition to healthier modes of travel.	Visitors will benefit with improved cycle infrastructure at visitor sites. Contribute to meeting national emissions targets for Scotland. Providing exemplar public body actions.

#	YEAR	ACTION	INTERNAL BENEFIT	WIDER BENEFIT
7	Ongoing	Utilising our Green Champions Network to educate and influence staff and external stakeholders in making more sustainable travel choices.	Foster a sustainable travel culture across the organisation. Health & Wellbeing of staff improved.	Improve visibility of visitor sites that are linked to the National Cycling Network and Local Authority cycle/walking networks. This could increase the potential for partnership working on regional walking and cycling routes and networks. Possible increased revenue at sites by promoting sustainable travel potential to the public. Reduced business travel emissions to help deliver on national emissions targets.
8	1-5	Provide improved modes of cycle transport such as electric pool bikes, where feasible.	Reduce emissions and costs associated staff business travel. Health & Wellbeing of staff improved.	Reduced business travel emissions to help deliver on national emissions targets. Inspire other organisations and public to follow suit.

3.4 BIODIVERSITY

3.4.1 DEFINITION

The Scottish Government defines Biodiversity as all life forms and their interactions with the environment to form living systems (ecosystems) which sustain nature and upon which our own survival depends. HES has statutory obligations in relation to Biodiversity, as well as numerous opportunities across our operations to support it. The management of Properties in Care has opportunities both for supporting and improving biodiversity and increasing understanding of the natural environment. Many Properties in Care and other historic sites have been protected from development, particularly agricultural improvement, which has allowed the preservation of local habitats and species. Many sites therefore support populations of rare birds, bats, amphibians and invertebrates as well as forming important wildlife corridors, allowing plants and animals to migrate as part of normal activity and to spread as a result of pressure from factors such as development and climate change.

Climate change is introducing specific challenges to managing biodiversity at our sites. Extreme weather events can make large and historic trees and landscapes more vulnerable to damage, whilst changing weather patterns will shift the optimum conditions and habitats for certain species. Additionally, the spread of pests and diseases will result in damage and loss. Proactive actions will be required in order to maintain the biodiversity value not just of our sites but across the historic environment.

3.4.2 PROGRESS TO DATE

Our Ranger Service undertakes site management, education and interpretation, and a large proportion of their work is related to biodiversity. HES employs a Natural Heritage Advisor supporting staff and others on biodiversity issues relating to site management, interpretation and education. In 2018, HES appointed its first Landscape Manager to oversee a strategic approach to landscape management across the HES Estate. Many of our Green Champions undertake local initiatives to promote sustainability and good environmental practice across our sites.

Our Scheduled Monument Consent process includes a section on wildlife to ensure proposed works do not affect European Protected Species, Sites of Special Scientific Interest (SSSI), special protection areas and special areas of conservation.

Our education programmes commonly cover conservation of both the natural and historic environment, and our volunteer programme provides opportunities for those with an interest in nature and conservation to get involved in conservation.

Our site staff undertake biodiversity improvement actions on our sites and working in partnership with others, and the drafting of a HES Biodiversity Policy is also being carried out by the Ranger team

3.4.3 AMBITION GOING FORWARD

Historic Environment Scotland will build upon its existing work on biodiversity, and meet or exceed relevant targets of the 2020 Challenge for Scotland's Biodiversity, as well as expand and increase partnerships and involvement of others across the organisation. Biodiversity will be taken into account in all relevant decision making and embedded into corporate targets. The effects of climate change on biodiversity at our sites will be better understood, and proactive actions will need be taken to protect and manage vulnerable sites and maintain biodiversity

CASE STUDY: GRASSLAND MANAGEMENT

Grassland Management assists the protection of existing species-rich meadow, undisturbed or unimproved grassland. Many of our sites have important grasslands that have been protected from agricultural improvement by virtue of their historical significance, and act as havens for plants and dependant animals. For example, Balvaird Castle in Perthshire has grassland with rock rose which supports a rare Northern Brown Argus butterfly colony, and the Ring of Brodgar in Orkney has a flower rich meadow which supports orchids and the rare great yellow bumblebee.

Our ongoing review of grassland management is identifying additional sites with areas of grassland where biodiversity could be increased by reduced or discontinued cutting. Such changes in management practice will provide suitable conditions for a range of plants, birds, invertebrates and small mammals that prefer tall vegetation, an abundant litter layer and freedom from disturbance.
This will particularly:

- Allow plants to flower, providing additional nectar sources for adult insects;
- Provide undisturbed grass for litter dwelling insects;
- Provide seed heads both as a source of food and for hibernating insects;
- Provide grass tussocks for overwintering insect; and
- Provide cover and feeding for small mammals.

This will also enable feeding for other predators especially owls and kestrel which have suffered from a reduction in prey rich field edges and rough pasture.

3.4.4 ACTIONS

#	YEAR	ACTION	INTERNAL BENEFIT	WIDER BENEFIT
1	1-5	Better understand the effects of climate change on biodiversity across our estate, through research, collaboration and monitoring/surveys.	Ensure evidence based decision making for proactive management of climate change impacts.	Wider relevance to historic plantings and landscape through development of best practice, advice and guidance.
2	1-2	Develop and roll-out a Quarterly Biodiversity Working Group for the organisation.	Communicate the necessary requirements of both staff and visitors relating to Biodiversity. Potential avenue to request additional support for Biodiversity projects. Co-ordinate dialogue between relevant departments and stakeholders within the organisation to foster a shared vision.	Can incorporate public and visitor related feedback into internal discussions within the organisation. Help deliver on relevant targets set by the 2020 Challenge for Scotland's Biodiversity, etc.
3	1-5	Expand and increase involvement of relevant stakeholders across the organisation in Biodiversity, Conservation and maintenance of our sites.	The benefits and needs of Biodiversity are shared with all staff, improving visibility and knowledge of its importance to staff and visitors alike. Incorporates Biodiversity more closely into current and future management processes.	Can involve visitors and the wider public in organisational activities relating to the Biodiversity, Conservation and maintenance of sites, etc. Help deliver on relevant targets set by the 2020 Challenge for Scotland's Biodiversity, etc.

#	YEAR	ACTION	INTERNAL BENEFIT	WIDER BENEFIT
4	2	Biodiversity embedded into organisational targets by ensuring that it is taken into account in all appropriate decision making within the organisation.	The benefits and needs of Biodiversity are shared with all staff, improving visibility and knowledge of its importance to staff and visitors alike. Tangible targets help staff to deliver on Biodiversity improvements across the organisation.	Help deliver on relevant targets set by the 2020 Challenge for Scotland's Biodiversity, etc.
5	1-5	Help conserve and where possible increase Biodiversity at HES properties through good management and targeted action for key species and habitats. This includes improved partnerships with other organisations relating to Scottish Biodiversity and landscape, etc.	This will help Conserve reservoirs of local species and habitats and facilitate the free flow of wildlife by maintaining wildlife corridors and safeguarding linear wildlife features. Contribute to climate stability and assist with mitigation against climate change. Ensure that improving the health of ecosystems at our sites, etc. improves their ability to better withstand and recover from the impacts of climate change and major weather events.	Help deliver on relevant targets set by the 2020 Challenge for Scotland's Biodiversity, etc. Increased visitors and revenue to sites that provide exemplar areas of Biodiversity or diverse ecosystems.
6	1-5	Expand and increase awareness, understanding and enjoyment of biodiversity by engaging more people in the conservation of both the natural and historical environment.	Improving the Biodiversity of our sites can improve overall visitor experience and education when relevant interpretation is provided. This includes the development and improvement of what we already have to promote the good work that has already been done.	Help deliver on relevant targets set by the 2020 Challenge for Scotland's Biodiversity, etc. Increased visitors and revenue to sites that provide exemplar areas of Biodiversity or diverse ecosystems.

#	YEAR	ACTION	INTERNAL BENEFIT	WIDER BENEFIT
				Foster a culture of Biodiversity with staff so they are better aware of their wider impacts upon our environment.
7	1-5	Aim to have joint policy statements on landscape and to develop more special landscape areas.	Better alignment of Biodiversity related objectives between directorates and staff, allowing for improved delivery of such objectives. Improved knowledge sharing.	Help deliver on relevant targets set by the 2020 Challenge for Scotland's Biodiversity, etc.
8	3	Collate all necessary data relating to biodiversity & develop interactive GIS layering for better geographical understanding of Biodiversity.	Improved management of any risk to biodiversity associated with environmental hazards.	Help deliver on relevant targets set by the 2020 Challenge for Scotland's Biodiversity, etc. Potential to share data and outcomes with other organisations relating to how Biodiversity influences risk and adaptation measures at sites.
9	1	Improved communications activity and engagement on Biodiversity.	Share the good work that is already being done internally. Improve dialogue on Biodiversity with Communications Department.	Share the good work that is already being done externally. Allow the public and other organisations to engage and celebrate current and future Biodiversity actions.
10	1-5	Maintain, improve and promote linkages between the Biodiversity and landscapes of HES and other organisational sites.	Potential for improved partnerships internally, and with organisations or Local Authorities who want to develop green networks, paths, etc.	Wider path networks to improve health and wellbeing and increase appreciation of nature and landscape.

3.5 BEHAVIOUR CHANGE

3.5.1 DEFINITION

Behaviour change has been identified as a core activity as it underpins almost all of the key components of the CCEAP. The importance of this has been recognised by Scottish Government with development of the ISM toolkit which supports change through addressing Individual, Social and Material behaviours; and public bodies are encouraged to adopt and disseminate the methodology in order to promote low carbon behaviours. In many cases a primary way to achieve lower carbon emissions or waste reduction is by encouraging behaviour change in staff, visitors, and others who we can influence. It is likely that through small incremental changes of behaviour that we will be able to corporately achieve more sustainable practices, and by building upon this undertake the transformational changes necessary to achieve our targets.

3.5.2 PROGRESS TO DATE

Since the Green Champions Network (GCN) was created in 2012, over 140 staff members have joined or are acting as Green Champions in some capacity. Continued engagement of Green Champions through regular campaigns and the annual Green Champions Conference has allowed us to share successes and encourage others in making change. Numerous initiatives and campaigns in the past few years have led to increased staff engagement (e.g. waste amnesties, reusable cup campaigns, repair surgery drop-in sessions etc.). The HES GCN is well respected in the sector; we were invited to speak about its success at a Sustainable Scotland Network event for the public sector in 2017. In 2016, we commissioned an independent review of our Green Champions network, with findings being used to inform the running of the network and the annual Green Champions conference thereafter.

Our leading role in driving change, both within the organisation and the wider sector, has been recognised with a number of awards, including the WWF Scotland Public Body Champion award in 2014, 2015 and 2016 and 2018. In 2018 we received a UK Fit for the Future Changemaker award presented by Sir Ed Davey at a ceremony in London in recognition of our innovative climate change risk assessment work.

3.5.3 AMBITION GOING FORWARD

By building on the success of the GCN thus far we will increase visibility and broaden staff participation across the organisation. We will empower Green Champions to set a wider example of best practice which positively encourages behaviour change. HES can take advantage of its position and potential reach to lead and influence behaviour change in Scotland and more widely. This will be achieved by our staff demonstrating best practice and striving for continued improvements within our organisation and at our Properties in Care

CASE STUDY: GREEN CHAMPIONS NETWORK

Historic Environment Scotland's Green Champions Network is a group of staff members who have committed to work collectively to tackle climate change. It was set up in 2014 to involve more of our staff in climate change work and to help promote behaviour change within the organisation. Since the network was launched it has grown to include 130 members which is approximately 10% of HES staff. Green Champions are drawn from every business area and across the whole of the HES estate from Orkney in the north to the Scottish Borders in the south. I

The responsibilities of a Green Champion vary depending upon where they are based and what their primary role is. Each commits to approximately two hours per month including supporting campaigns and events organised by the Climate Change Team. Examples of the achievements of our Green Champions include setting up wildlife trails and composting at selected sites, planting wildflower gardens to help improve biodiversity, and promoting best practice in terms of reducing energy use and improving recycling amongst their teams.

Local groups of Green Champions meet up at regular intervals throughout the year to report progress and work together on projects. We have an annual conference which gives our staff the opportunity to come together to find out what others have been working on, gather new ideas they can take back to their own site and support each other in influencing change throughout the organisation. In 2016, we commissioned an independent review of our Green Champions network, with findings being used to inform the running of the network and the annual Green Champions conference. As the network continues to develop, we hope to grow membership and intend to set up more local groups with the hope of empowering Green Champions and these groups to be able to make more positive changes at their own sites.

3.5.4 ACTIONS

#	YEAR	ACTION	INTERNAL BENEFIT	WIDER BENEFIT
1	Ongoing	We will continue to grow and support the Green Champions Network (GCN) so that 15% of staff are official and active Green Champions by 2024.	Engaging staff in the GCN will contribute to their professional development by giving them the opportunity to learn new skills associated with behaviour change, internal communications, and working as a team with staff from across the organisation. Such teamwork can help create a feeling of belonging, increases staff wellbeing and retention. Embedding a green ethos into the organisation through the GCN will encourage wider behaviour change amongst staff at all levels of HES. Such behaviour change will help to achieve the goals laid out elsewhere in the CCEAP, including carbon and waste reduction targets.	Through changes in behaviour we will be able to achieve our own targets which are in line with those set by the Scottish Government, therefore contributing to national targets.
2	1	We will create a system which will allow interested members of staff to receive regular updates from the Climate Change Team and GCN without the commitment of being a Green Champion.	Dissemination of information to a wider pool of staff is essential to supporting and promoting the work of the climate change team. By informing more staff about our team's work and how it relates to other parts of the organisation we can help show the relevancy of climate change to the work of HES staff. Moreover, disseminating clear and good quality information regarding the effects of climate change, mitigation measures and adaptation opportunities will enable staff to make informed decisions in their work and behaviour. This is likely to lead to an increase in environmentally-friendly behaviour amongst staff and greener operations for HES.	As more of our staff are engaged and setting a positive example of best practice this will extend beyond HES to our partners, stakeholders and visitors. Therefore setting an example of how they too can make an impact through, for example, reducing waste and emissions.
3	1	We will create training and a resource pack for managers to allow them to support Green Champions in making	By providing training and resources for managers it will allow them to successfully empower and support Green Champions in making the behaviour changes required. The purpose of this training will be to illustrate to managers the	We will publish and share our resources with others.

#	YEAR	ACTION	INTERNAL BENEFIT	WIDER BENEFIT
		operational changes within their team/site.	tools that Green Champions may need in order to make a real impact in their workplace. They will then be able to demonstrate to Green Champions how to go about making changes within their workplace as well as support them where necessary. This should provide Green Champions with the knowledge and support required to drive forward projects in their areas.	
4	Ongoing	We will create and distribute a Climate Change Resource Pack to all new members of staff joining Historic Environment Scotland, make it available to existing staff members and continue to offer Climate Change Awareness training to staff with the aim to have 75% of staff trained by 2024.	In order to set out clearly our vision and our environmental responsibilities as a large public sector organisation, we will create a resource that all new, and existing, staff can refer to. Through continued and increased staff awareness we will be able to embed these ideas into the working culture of our staff, delivering long term institutional benefits.	Where possible, we will share training resources with others (e.g. through Sustainable Scotland Network).
5	1	We will create regional Green Champions groups and facilitate quarterly meetings for these at centralised “hubs” in their geographical areas.	This will give Green Champions across different business areas the opportunity to get together to discuss projects, plans and challenges. Such groups will allow Green Champions to better support each other in their work, increasing the likelihood of successful projects. These groups will be made up of people from different business areas and from all pay grades which will allow people to build connections and relationships across the organisation, benefitting HES by creating clear lines of communication between departments, thus streamlining operations.	Groups such as these create opportunities for working with local partners and building on existing relationships by talking about specific issues which have a wider importance.

#	YEAR	ACTION	INTERNAL BENEFIT	WIDER BENEFIT
6	Ongoing	We will continue to offer a varied programme of focused events and campaigns for staff.	Activities and campaigns for staff reinforce positive behaviour changes. The programme will build upon the Climate Change Resource Pack issued to all staff, Climate Change Awareness training and work being carried out by both the Climate Change team and GCN. Events such as the annual Green Champions Conference are an opportunity to celebrate successes thus reinforcing positive behaviour change, while seminars delivered by external speakers can inspire us to take further action. By continuing this programme we can continue to remind staff what is expected of them, for example when it comes to waste disposal or energy use. This reinforcement of the same message will lead to increased behaviour change. These behaviour changes are required for the success of many of our other aims.	Events and campaigns allow us to work with partners to build and develop relationships. This may also open up opportunities for us to be invited by others to speak on the work that we are doing.

3.6 RESEARCH, EDUCATION AND TRAINING

3.6.1 DEFINITION

Research, education and training in climate change is a key activity for HES. It forms a significant part of the work of the Climate Change team with crucial support from other areas of the business such as Technical and Science Research, Digital Documentation and Innovation, Biodiversity and the Procurement team. Some of our research (and dissemination) is directly mandated by Scottish Government, and HES is named in a number of policy documents and programmes. Climate change is a new and fast moving area bringing distinct challenges, and research is essential to gain a good understanding of the impact on the historic environment and ways to reduce its effects. Through our technical training programmes we aim to ensure that the next generation of heritage professionals are trained to a high standard and equipped to deal with the challenges and opportunities presented by a changing climate.

3.6.2 PROGRESS TO DATE

Since 2012 our Technical Research Team have published 26 Technical Papers and 32 Refurbishment Case Studies, most of which outline approaches for improving energy efficiency and/or increasing resilience against climate change impacts in different traditional building types throughout Scotland. These publications complement our Short Guide and INFORM series. To date we have published four Short Guides directly related to climate change covering topics including micro-renewables in the historic environment, climate change adaptation and improving energy efficiency in traditional buildings. To date there have been five INFORM guides published with a direct relevance to climate change and good practice to increase the resilience of the historic environment to changes in our climate. Our leading research has been recognised by several awards, including the 2015 UK Green Apple Award presented to our Technical Research team in recognition of their pioneering research into energy efficiency improvements in traditional buildings, and the Green World Ambassador award 2016. We have been partners in several EU research projects and currently lead on two major international projects with involvement in three others.

Since 2012, 11 interns have completed one year training placements with the Climate Change and Technical Research teams. We have supervised and continue to support several PhDs related to climate change, with students from Universities including Glasgow, Stirling and Oxford. The results of these projects have been disseminated through both academic and sector-focused publications. Through our network of Green Champions over 10% of the HES workforce has direct access to knowledge and expertise. Complementing this we have provided Climate Change Awareness training to 539 members of staff across 12 sites.

HES staff are in high demand to deliver external facing presentations and events to the wider sector, and further afield. Staff have been invited to present at numerous national and international climate change focused conferences including the European Climate Change Adaptation Conference and the International Climate Heritage Mobilisation event. In 2015 alone nearly 500 delegates attended energy

efficiency events held by the Climate Change and Technical Research teams.

3.6.3 AMBITION GOING FORWARD

Historic Environment Scotland are already leading researchers in the field of climate change and cultural heritage, acting as an exemplar to others in the sector and leading the way on innovative research and applications. We want to bring new talent into the sector and support our own staff to engage with the issue of climate change. From this position of strength we will support others in the international arena who can benefit from our experience and resources, and we will work more widely to advocate responsible actions and promote the positive role that cultural heritage can play globally in our response to climate change. We want to maintain our lead and innovative approach and take our knowledge and expertise beyond the heritage sector to engage more widely, allowing heritage to be a positive driver through which to address the biggest problem facing our generation.

CASE STUDY: REFURBISHMENT CASE STUDIES

Historic Environment Scotland has published over 30 Refurbishment Case Studies stemming from our technical research programme. These reports describe work in historic or traditional buildings undertaken in order to trial and demonstrate suitable repairs or upgrades. In most cases these projects have been delivered with partners in the public or social housing sector and are largely on the themes of energy efficiency and climate change adaptation, for example allowing buildings to better handle increased rainfall. The projects involve interaction with contractors and clients to deliver examples of best practice fabric upgrades and are published in order to allow others to learn from the work and apply the principles and techniques to their own situation. In some cases there is community involvement relating to training and upskilling in the use of traditional materials. These research projects also give HES the background knowledge, information and data from which more generic best practice guidance can be developed and published. This knowledge and expertise is passed onto the public through the HES Short Guides and Inform Guides series. While energy efficiency improvements has been a big theme, other emerging areas are subjects of trials and demonstration including the use of traditional mortars, works to marine infrastructure, interim or temporary repairs, slate roof repairs, management of damp, conservation of vernacular buildings and work to clay and thatched buildings.

An independent review of 18 of the Refurbishment Case Studies, focused on energy efficiency improvements, was published in 2018. This review concluded that it is indeed possible to implement significant energy efficiency measures to improve thermal comfort levels for occupants, without compromising the character and functionality of traditional buildings. All our technical advice and guidance is freely available on line, and the Refurbishment Case Studies can be found at https://www.historicenvironment.scot/about-us/what-we-do/conservation/refurbishment-case-studies/

3.6.4 ACTIONS

#	YEAR	ACTION	INTERNAL BENEFIT	WIDER BENEFIT
1	Ongoing	We will offer a minimum of four, one year climate change training placements through our conservation trainee programme over the next five years.	We will continue to train the next generation of climate change/heritage professionals by providing internships tailored to the work of the climate change team. Previous interns have played crucial roles in milestone achievements for HES, including the formation of the Green Champions Network and undertaking the first phase of our Climate Change Risk Assessment.	Our internship programme offers training opportunities aimed at recent graduates within a field that is often difficult to find employment breaks. Interns are equipped with skills and experience that are highly desirable in sectors beyond our own. The internship programme also provides an opportunity for HES to train the next generation of heritage professionals, with many graduates of the scheme already working for organisations across the country.
2	Ongoing	We will undertake and support research that is directly related to measuring and monitoring, understanding and practically addressing the impacts of climate change on our cultural heritage. We will supervise a minimum of 6 PhDs in collaboration with various UK and International research institutions and universities.	HES technical staff have supervised multiple PhD projects over the past 10 years. The research and outcomes of these projects often results in directly applicable benefits for HES and the wider historic environment, particularly in areas such as understanding the impacts of climate change on material decay.	
3	Ongoing	We will publish a new case study series on a range of climate change related topics, and publish a minimum of 20 new technical papers/case	Based on our research and subsequent publications to date, HES has established itself as a primary resource for information and guidance on matters relating to climate change and the historic environment. As such, there is an expectation on us to continue to disseminate knowledge and best practice out to the sector, and further afield. This gives HES a unique position to help influence and inform meaningful	

#	YEAR	ACTION	INTERNAL BENEFIT	WIDER BENEFIT
		studies covering topics on climate change adaptation and mitigation, building on the substantial resource that already exists.	climate action. Carefully articulated and focussed dissemination of such guidance can also make a big impact to local communities and concerned individuals – making complex topics understandable a way that people feel able to make more informed decisions about their own properties.	
4	1	Through the Our Place in Time Climate Change Working Group, we will publish a guide to raise awareness of the physical impacts of climate change on the historic environment in the heritage sector.	Production of a concise guide on the impacts of climate change will allow us to bring together various strands of research into one publication. This guide would complement material we have already published in our Short and INFORM Guide publication series, as well as the Technical Research Case Study Studies.	We have identified a gap in existing literature here; and the guide would be of use to professionals as well as homeowners, interested members of the public and local community groups.
5	1 to 3	Research potential of crowdsourcing for conservation. Exploring the impact of crowdsourced imagery for monitoring of climate change impacts at specific PICS, in particular unmanned and remote sites. Collaborative SEAHA PhD student investigating this area.	Crowdsourcing data for use in the conservation and maintenance of our PICs could lead to increased public engagement with our conservation and climate change agendas. There is the potential for generation of meaningful data beneficial for conservation decision making processes. If successful, lessons learnt and an approach to doing this could be disseminated to the wider sector.	
6	Ongoing	We will utilise our Digital Documentation and Learning facilities at the Engine Shed to create educational resources to help visualize the impacts of	The facilities at the Engine Shed will allow us to create world-first educational resources highlighting the impacts of climate change on our cultural heritage, in a way that has not been done previously.	

#	YEAR	ACTION	INTERNAL BENEFIT	WIDER BENEFIT
		climate change on our cultural heritage.		
7	2	Enhancement of Engine Shed augmented reality interpretation to incorporate Met Office UKCP18 layers to create an interactive learning resource.	Improvement in awareness and education of general public to threats of climate change on our historic environment. This would also allow us to showcase the Engine Shed as a world- leading educational resource with respect to understanding climate change impacts on the historic environment.	
8	Ongoing	We will host a minimum of 3 climate change related outreach events each year to disseminate results of work being undertaken by HES	Through public engagement we can increase awareness of climate change and the impact it has on the historic environment. This would also allow us to showcase what the heritage sector can offer with regards to climate action and leadership. Climate Change related events can also act as a platform to foster discussion and the exchange of knowledge within, and beyond, our sector as well as engaging with local communities and interested individuals.	

3.7 SUSTAINABLE PROCUREMENT

3.7.1 DEFINITION

Undertaking sustainable procurement is key to ensuring we are contributing to the Scottish Government's purpose central to the National Performance Framework, creating resilient communities. Responsible purchasing leads to environmental, ethical, social and economic benefits. Smart use of procurement can play a key role in promoting jobs and growth, encouraging innovation, boosting training and apprenticeship opportunities and helping small and medium enterprises (SMEs) third sector organisations and supported businesses to compete effectively for contracts.

3.7.2 PROGRESS TO DATE

HES has dedicated Sustainable Procurement Guidelines that aim to apply the principles set out in the Scottish Ministers' Sustainable Procurement Action Plan. This provides staff with purchase guidance in a number of key business areas. We use 'Sustainability Tests' for larger contracts to ensure that we build sustainable criteria into the specification of the product or services where possible and also link this to evaluation criteria. We also use, where applicable, the Sustainable Procurement Tool developed by the Scottish Government in response to the sustainable procurement duty included in the Procurement Reform (Scotland) Act 2014. In line with best practice guidance, we have included the evaluation of employment practices and 'workforce matters' in the pre-selection documents for larger projects. We continue to promote the use of supported businesses and related organisations within HES with the result that several contracts have been placed with businesses who have a social and environmental purpose and those who are committed to giving people with disabilities the opportunity to be involved in a work environment.

We require, for relevant contracts, confirmation that goods have been procured in line with fair and ethical requirements e.g. procurement of timber goods with regard to Scottish Government Timber procurement policy. Included in the procurement of uniform items is a requirement that all goods are produced in line with the employment legislation of the country of origin and in accordance with all International Labour Organisation (ILO) conventions that have been ratified by the country of origin. Suppliers are asked to provide evidence of responsible sourcing and supply chain monitoring. In November 2017, HES received accreditation as a Living Wage Employer, as recognised by the Poverty Alliance, the Living Wage Foundation and the Scottish Government.

In 2015, we developed a sustainability matrix for the selection of building materials, techniques and technologies for the Engine Shed construction project. This proved instrumental in achieving the sustainability and circular economy outcomes that have been achieved in the project and has gone on to win several awards.

3.7.3 AMBITION GOING FORWARD

HES will embed sustainable procurement throughout all of its activities with the aim of being innovative and transformational when sourcing goods and services that contribute to Scotland's wider sustainable economy and the transition to a circular economy. We will aspire to be a sector leader in facilitating better procurement of traditional skills and materials within the construction sector through developing framework contracts for others to follow, and actively seek opportunities to be exemplars in design and operations. Our programme of actions aims to reflect this vision and to look for ways to drive this ambition forward.

CASE STUDY: THE ENGINE SHED SUSTAINABILITY MATRIX

The Engine Shed is our new Building Conservation Centre based in Stirling, designed to showcase best practice and provide a hub for our technical outreach, training and research. The construction of the building involved rescuing a derelict military shed and transforming it into a dynamic space to showcase building conservation in Scotland and provide space for training, events and conferences.

In order to define standards for sustainability for the construction of the Engine Shed a Sustainability Matrix was developed with input from the whole project team at the design stage of the project. These standards were then able to be written into the tenders for the project and provide specifications for skills and materials and can become a tool to measure success.

The partnership working across the whole project team on these defined goals led to the realisation of ambitious and sector leading choices for building materials, techniques and technologies. Renewable heat sources where used alongside numerous energy saving technologies such as triple glazing and LED lighting. Furthermore, circular principles such as retention of material, reuse, recycling, flexibility of space, designing for disassembly and ease of access to services for maintenance and repair have all been implemented. The building can now be actively monitored and the success of these schemes and choices assessed to provide best practice case studies for sustainable and circular buildings in the future. Furthermore, social benefits have been realised through making connections with local communities and charities, through sourcing second hand materials and through commissioning products and services to be made from recycled and reused content.

3.7.4 ACTIONS

#	YEAR	ACTION	INTERNAL BENEFIT	WIDER BENEFIT
1	1	We will update HES Sustainable Procurement guidelines and ensure they are implemented throughout the organisation	The guidelines will give staff a clear framework to work within and result in boosting responsible purchasing throughout the organisation. They will lead in the longer term to financial savings as considerations of full life cost will be taken into account alongside repair, maintenance and upgrades of goods and services being written into contracts and therefore reducing the need for replacements.	We can use our purchasing power to maximise ethical, environmental, social and economic benefits. Investing in SMEs and support businesses.
2	1	We will evaluate and improve positive social, economic and environmental impacts of our operations by embedding sustainability checklists into tenders		
3	Ongoing	We will implement circularity principles in tenders	Moving to a circular economy will ensure our organisation is fit for the future. It will give us financial and material security and ensure we are at the forefront of innovation. It will also ensure we leave a positive legacy for future generations by leaving them with high quality materials and resources.	We have an opportunity to act as a sector leader in the many industries our organisation works within through working in a way that favours sustainability, waste reduction, support SMEs and supported businesses, provides training and apprenticeship opportunities, boosts local economies.
4	Ongoing	We will work with partners to deliver guidance and framework contracts for public bodies	Frameworks aid the purchasing of goods for the organisation and will significantly assist suppliers and specifiers. Working together with partners will ensure that we are working towards common goals and	Working in partnership and using common frameworks will maximise our purchasing power across all organisations to achieve further ethical, environmental, social and economic benefits.

#	YEAR	ACTION	INTERNAL BENEFIT	WIDER BENEFIT
			give further credence and legitimacy to our purchases.	
5	2 & 3	We will run training sessions for staff on sustainable procurement to upskill our purchasers and improve understanding of how this relates to the HES vision and values	Upskill our staff in responsible purchasing and keep them up to date on best practice as it emerges. This will extend responsibility for responsible purchasing to all corners of the organisation. It will empower staff to achieve wider benefits from their purchases and link them more closely to national and community benefits.	These sessions will capture staff making ad hoc purchases. This will allow staff to access and understand the ethical, environmental, social and economic benefits they can achieve through their purchases.
6	2 & 3	We will undertake audits of our supply chains for goods and services and being transparent	Ensuring we are not funding unethical and environmentally detrimental operations.	We should be showcasing our values through our purchasing power and this proposal will allow us to act as exemplar and set good examples of working practices.
7	1 - 4	We will set organisational targets for the procurement of construction materials and work to develop a Scottish framework for traditional materials and case studies to boost the traditional materials section in Scotland	We will ensure the future security of traditional materials supply which is integral to the conservation and maintenance of our monuments into the future. We will ensure that traditional skills continue to flourish in Scotland alongside a secure material supply.	Investing in businesses and services will boost the market for construction materials such as stone, slate and timber in Scotland - bringing with it jobs and economic investment for the Scottish economy. This will also, in the long term, ensure we have the appropriate skills and materials to maintain our historic environment into the future. It provides partnership opportunities to develop a sector wide strategy.
8	2 - 5	We will undertake research and publish best practice case studies on	We can measure the ecological footprints of our own buildings and projects with more accuracy, ensuring any construction we do is fit for the	Providing research opportunities to academics in a subject that could lead to real change, and setting a precedent for undertaking these types of audits by impartial bodies outside of the

#	YEAR	ACTION	INTERNAL BENEFIT	WIDER BENEFIT
		sustainable and circular procurement	future. We will maximise the environmental, financial and health benefits, amongst others, in the buildings we conserve, refurbish and build new.	commercial industries. This work has the potential to have far-reaching benefits such as health and wellbeing for the people of Scotland and internationally. Providing the research to showcase environmental benefits of traditional materials will also help to boost the sector in Scotland, giving a low resourced industry the tools to trade and compete with large international companies. Boosting small business and indirectly reinvigorating the traditional skills sector. Bringing jobs and economic investment to Scotland.
9	Ongoing	We will support circular and sustainable practices and produce case studies for locally produced, non-toxic materials; and we will invest in traditional skills.	Help us to achieve materials security through renewable sources. Could also provide a potential income stream through the selling of paint and/or other materials.	Provide best practice examples of how we can learn from historic practices such as flax growing in Scotland to contribute sustainable materials to the economic growth of Scotland. Boost to the economy and jobs in Scotland. Partnership opportunities - with industry and researchers.

3.8 CIRCULAR ECONOMY

3.8.1 DEFINITION

The circular economy is a new approach to changing how we interact with materials and resources. Changing our economic model away from a linear ('take, make and dispose') model and towards a more circular approach where materials and products are designed to last longer (and be maintained, repaired, upgraded, repurposed, reused and recycled in a continual loop) is integral to obtaining a secure future for our organisation and the wider historic environment, and to make a wider contribution. Waste is both a pollutant and a carbon emitter. All our business areas produce waste and as a waste producer we are responsible for the waste we generate and what happens to it. Moving our waste up the waste hierarchy and focusing on reducing waste is the key to reducing our environmental impact and to ensure material and financial security in a world of depleting raw materials. The Scottish Government's vision for a zero waste society is defined as one where all waste is seen as a resource; waste is minimised; valuable resources are not disposed of in landfills, and most waste is sorted, leaving only minimal amounts to be treated.

3.8.2 PROGRESS TO DATE

In 2011 holistic waste data collation for the Historic Scotland estate began to inform voluntary sustainability reporting to Scottish Government. This is now undertaken annually and reported on in our Sustainability Report which forms an annex to the organisation's Annual Report. It is also submitted as part of the now-mandatory Public Bodies Climate Change Duties Reporting. Alongside this the Historic Scotland Waste Prevention and Reuse Plan was published in 2013 to promote improved practice and highlight new legislative requirements. This was complimented by in-depth waste audits undertaken at a number of our larger properties between 2013-16, with Scottish Government support via Zero Waste Scotland, which led to the improvement of recycling facilities at those sites alongside visitor 'on-the-go' recycling pilot projects at Edinburgh Castle, Stirling Castle, Linlithgow Palace and Holyrood Park.

Since 2017 more detailed work has been underway to improve data capture and quality for the organisation to provide a better understanding and basis for moving our waste up the waste hierarchy. An independent external report was commissioned in 2017 to assess our waste management practices with waste audits undertaken at 15 sites and offices. The report recommended the creation of corporate guidance, further staff resource and updating of the existing waste contracts. In 2018 a Circular Economy Project Officer was appointed to undertake these recommendations. Work to improve the reuse rate for the organisation came in 2018 when we signed up to 'Warp It' as the first step to facilitate reuse and to link with partners who see our waste as their resource.

In March 2018 the first HES Litter Prevention Action Plan was published. This plan identified actions as well as providing case studies showcasing where we have been reducing the waste we produce, such as supporting community-led litter picks and providing improved bin infrastructure to help tackle this issue. In addition, independent litter audits for litter prone areas along the Antonine Wall were undertaken in 2015 by Keep Scotland Beautiful.

3.8.3 AMBITION GOING FORWARD

Circular Economy is a fast moving and emerging area and Scotland is recognised as a global leader. We have an opportunity to contribute to this through exploring innovative solutions to waste reduction and to start setting the bar for other organisations and our sector as well as encouraging wider changes in societal behaviours. The breadth of our work provides us with many opportunities to set standards for Scottish businesses, including public sector, retail sector, catering sector, tourism sector, construction sector, office services sector, digital sector and so on. A new waste plan will see us contributing to achieving Scotland's waste reduction targets which are some of the most ambitious in Europe, alongside us realising the financial, social and environmental benefits of waste reduction, litter reduction and the transition to a circular economy.

CASE STUDY: DISPOSABLE COFFEE CUPS

Work to reduce the number of disposable coffee cups used by our organisation has been ongoing since 2013 when we identified this non-recyclable waste stream as one we could significantly reduce. Since then, we have run multiple campaigns in our Longmore House head office café to incentivise reusable cup use, which led to a reduction in disposable cup usage from 76% to around 12-30%.

In 2017 we trialled using compostable disposable cups, which saw usage rise again to 36%. Following this we took part in a Zero Waste Scotland trial to charge 5p for each disposable cup (to work in a similar way to the plastic bag charge), which fed directly into a paper presented to Scottish Government detailing the options for a charge to be implemented Scotland wide. Our involvement in this was recognised by the Cabinet Secretary for Environment, Climate Change and Land Reform who spoke about it in her opening speech at the Scottish Resources Conference.

From the work we have done over the past six years, we've found that raising staff awareness through campaigns and providing a quality range of reusable cup alternatives works well in reducing disposable cup use. However, once these campaigns finished users began reverting back to old habits. Therefore, in October 2018 our Chief Executive announced that we would be removing disposable cups, soup containers and disposable cutlery from our head office and the Engine Shed. With over 450 coffee-loving staff in our head office, we will see a saving of around 5400 disposable cups per year at that venue alone. Following on from this we will be working closely with our catering contractors to discuss options for reducing use in our visitor cafes throughout our estate. We have a fantastic opportunity to reduce a hard-to-recycle waste and a pollutant to our environment and to contribute to an innovative solution to a global problem.

3.8.4 PROPOSED ACTIONS

#	YEAR	ACTION	INTERNAL BENEFIT	WIDER BENEFIT
1	2 & 3	We will develop and publish a Circular Economy Plan to identify new circular business models and opportunities for the organisation.	We will analyse our business processes and economic models and identify areas we can alter these to provide ourselves with economic and materials security. We will develop new income streams for our business based on circular models and ensure our business is fit for the future. We will also be able to access new funding streams for this work through Scottish Government.	We will be contributing to Scotland's transition to a circular economic model. By assessing our own business models we will be leading the way in this transition and acting as exemplar in this area.
2	1	We will implement a new corporate waste management, reduction, reuse and recycling plan detailing corporate standards, targets and staff guidance for our waste activities.	Corporate standard will ensure we are compliant and consistent in how we deal with waste across the organisation and promote waste reduction will result in long term cost savings. Appropriate health and safety guidance will help to prevent accidents in a highly hazardous activity, prone to fatalities. The provision of consistent and high quality recycling facilities is important to maintain our standards of excellence. Our quality assurance ratings carried out by Visit Scotland and Green Tourism award for recycling and waste reduction. Procurement guidance will promote waste reduction at point of purchase and ensuring staff are taking full life costings into account will ensure we are responsible purchasers, improve efficiencies of our organisation and result in long term cost savings.	Ensuring waste management across the estate is up to standard will contribute to meeting Scotland's Zero Waste targets of 70% recycling by 2025 and no more than 5% to landfill by 2025. Reducing waste will also reduce our carbon emissions in line with Scottish Climate Change Targets.
3	1	We will update contracts for waste collections to ensure compliance, improve	Standards for all waste contractors will ensure we are compliant with waste legislation and harmonise our waste activities across the estate. Improving our data on waste will allow us to identify income streams from	Ensuring contracts are thorough and covering our compliance responsibilities will contribute to Scotland's sustainable economic growth through investing our

#	YEAR	ACTION	INTERNAL BENEFIT	WIDER BENEFIT
		standards and improve monitoring and reporting on waste.	valuable materials and areas we can save on disposal costs by moving our waste up the waste hierarchy. Better records management and use of digital systems will mean we can incorporating waste management into organisation wide systems (PICAMS/SIGMA) and will improve organisational efficiencies such as saving staff time spent on organising waste contracts and administering them.	money responsibly. We can also realise social benefits from freedom to procure local waste services and put a focus on SMEs and supported businesses
4		We will incentivise organisation wide waste reduction by costing waste disposal into P&L accounts and assigning responsibility to business areas with transparent accounting.	Assignment of responsibility of waste to business areas will allow departments to cost waste into profit and loss accounts and thus access the benefits associated with waste reduction and be recognised for progress in this area. This will lead to new and innovative waste reduction methods being identified by those whom generate it. National and international recognition is to be gained.	We will look to implement a model which will see waste reduction as an integral part of all roles within the organisation. Thus maximising our successes and outputs and further contributing to Scotland's vision for a zero waste society.
5		We will identify areas where we can undertake focused waste transformation projects in areas such as packaging, plastics, printing and biodegradable waste by championing digital and reusable alternatives and	We can identify areas where we can make real inroads in waste reduction to reduce waste costs and access rebates from valuable materials. Ensuring we are keeping below a certain packaging threshold means that we do not have to pay for PRNs. We will also contribute to an improved visitor experience as consumers are becoming more environmentally conscious. Providing more eco-friendly alternatives are likely to make customers feel even better about their purchases and ensuring we are not passing on non-recyclables to our visitors we can have a wider	By investing in recycled content and recyclability of our products we are boosting the market for these goods, making them more accessible to others and helping towards the transition to a circular economy in Scotland. We will also be contributing to the international push on plastics reduction, initiated through the EU Strategy for Plastics. Our investment in materials that are less damaging for our environment will

#	YEAR	ACTION	INTERNAL BENEFIT	WIDER BENEFIT
		composting alongside reducing amount of non-recyclable materials and products we produce.	impact. Focusing on non-recyclable waste reduction will also save money on sending waste to landfill through landfill tax.	increase the demand for these and boost these markets in Scotland and further afield.
6	Ongoing	We will understand better and negate the negative impacts of our construction waste and work with stakeholders to find sector wide opportunities for construction waste reuse and reduction.	Better understanding of what waste we are producing in construction will allow us to identify areas were waste reduction and associated costs savings can be made. A sector wide construction waste reuse scheme with a focus on traditional materials will ensure materials security for the continued conservation of our historic environment. Helping to ensure that materials are always available for authentic, successful and long lasting repairs on our estate. Furthermore, it provides ease of access to salvaged materials with will reduce cost, waste generation and dependence of non-renewable raw materials for our work.	Construction waste accounts for 50% of all waste in Scotland. Tackling this is paramount to Scotland achieving its zero waste targets, reducing greenhouse gas emissions and pollutants entering the environment. Improving our waste data and providing tools to assist reuse by forging links with external partner's means we can achieve social and community benefits from donating our waste to those who can utilise it. We will also be securing the place of building conservation within the transition to a circular model. Making it easier to repair historic buildings ensures a brighter future for our historic environment.
7	Ongoing	We will invest in digital innovations. From providing alternatives to print to increasing efficiencies in work schedules and developing new	Investing in digital technologies means we can be a smart organisation, increase efficiencies, keep up with innovation, automate compliance, improve connectivity and reduce data protection risks. Keeping up with digital innovation is paramount to ensuring the future of our business and the relevance to society. It brings cost savings from reducing in-printing costs and new opportunities for income	Investing in digital technologies will help us to link our reports and data to wider national databases with ease. It can also extend the reach of the Scottish Historic Environment to a much wider and international audience. Our historic places will therefore be more accessible and more relevant to modern society.

#	YEAR	ACTION	INTERNAL BENEFIT	WIDER BENEFIT
		business models through digital platforms	streams from new style interactive, digital versions of our guidebooks. This will also improve our reach, accommodating more language and accessibility needs, incorporating learning outcomes, and becoming a key resource for creative inspiration.	
8	Ongoing	We will work with the wider sector and partners to propel and invest in circular projects, products and services, including working towards a sharing economy, forging new routes to reuse and investing in the repurposing and recycling sectors to keep these traditional skills alive.	Promoting a 'sharing economy' will result in a range of efficiencies being realised throughout the organisation including financial and staff time - it will also reduce the amount we spend on purchasing new or multiple infrequently used items. Sharing across directorates in the organisation can improve cross departmental links. Social linkages can improve health and wellbeing of staff. By forging closer links with materials-processing industries we will have greater control and understanding of how our waste is repurposed and/or recycled. It will also lead to cost savings from transforming our waste into a resource.	We can use our purchasing power to boost circular innovation in Scotland and contribute towards the multiple economic benefits associated with a transition to a circular economy in Scotland. Zero Waste Scotland estimate that, by 2050, a more circular economy could reduce carbon emissions by 11 million tonnes per year. Forging reuse networks with other organisations can also allow for greater partnership working. Boosting the repurposing and recycling industries in Scotland will ensure that these skills are kept alive for future generations and improve capacity for Scotland to process its own waste and find new ways to make waste a resource and boost the economy of Scotland.
9	1 - 3	We will take action on food waste and food miles and explore ways of better using our natural resources.	Ensuring food waste is reduced, recycled or composted lowers our environmental impact and can transform waste into a resource. Our estate includes a variety of natural resources including orchards, gardens, which have potential to be utilised in a more productive way. There may be opportunities for new income streams, through our shops and cafes, of for	We will be contributing to sustainability and security of food and natural materials in Scotland by utilising the resources we have, reducing the amount of GHG emissions from transportation (e.g. food miles) and also reducing the amount of packaging required. We will increase the

#	YEAR	ACTION	INTERNAL BENEFIT	WIDER BENEFIT
			wider benefits and partnerships. There is opportunity to explore the wider potential of land and natural resources in relation to other materials, such as linseed for traditional paint. These opportunities can also provide healthier workplaces and enhance wellbeing.	quality, availability, and demand for skills (e.g. gardening), supporting jobs and industry in Scotland. We will be contributing to increasing understanding around food and material sustainability and could provide learning outcomes for local school and community groups.

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