

# CLIMATE READY SCOTLAND: Scottish Climate Change Adaptation Programme

## Fourth Annual Progress Report

May 2018



“In Scotland we are already starting to feel the impacts of a changing climate, and more serious impacts are being felt across the world, particularly by communities that are already vulnerable.

“No-one should be in any doubt about the determination of Scotland to discharge our moral responsibility to deal with climate change.”

**Roseanna Cunningham**  
**Cabinet Secretary for Environment, Climate Change and Land Reform**

Ministerial Foreword to the Climate Change Plan, February 2018

**Laid before the Scottish Parliament by the Scottish Ministers under Section 54 of the Climate Change (Scotland) Act 2009, May 2018**  
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# **CLIMATE READY SCOTLAND: Scottish Climate Change Adaptation Programme Fourth Annual Progress Report, May 2018**

## **PURPOSE OF THE REPORT**

### **Fourth Annual Progress Report**

Under Section 54 of the Climate Change (Scotland) Act 2009, Scottish Ministers must make annual reports to the Scottish Parliament assessing progress on Scotland's statutory Adaptation Programme. This is the Fourth Annual Progress Report on the first five-year Scottish Climate Change Adaptation Programme published in 2014.

This Report sets out the context for climate adaptation in Scotland, highlighting that we are already experiencing climate change, that there are a range of future risks and opportunities, and that we have a developing evidence base that is informing action. It sets out the statutory requirements for adaptation in terms of an Adaptation Programme, its update and yearly progress reports. It provides a summary of the core content of the Programme, the highlights to date, and the findings of the first Independent Assessment of the Programme in 2016. Finally, this Report refers to the development of Scotland's second five-year Adaptation Programme which is to be published in 2019.

#### **Previous Annual Reports**

[The first annual progress report](#) was published in 2015.

[The second annual progress report](#) was published in 2016.

[The third annual progress report](#) was published in 2017.

## SCOTLAND'S CHANGING CLIMATE

### Scotland's climate has already changed

Climate change is affecting Scotland now, with increases in seasonal temperatures, annual rainfall and sea level.

Average temperatures in Scotland have increased in line with global trends, with average annual temperatures now around 0.7°C higher than they were a century ago. The average temperature in the first decade of the twenty first century in Scotland was 0.9°C warmer than the average for the thirty year period 1961-1990 and it was warmer than any other decade since records began in 1910. Scotland's warmest year on record was 2014. In 2016 the average temperature was 0.8°C higher than the average for 1961-1990.

Scotland's annual rainfall has increased since the 1970s and is now 13% above the average for the early decades of the twentieth century.

The BBC's Landward programme on Scotland's National Coastal Change Assessment, broadcast from Montrose in April 2018, showed how significant coastal erosion is to some vulnerable places.

#### **Case Study: Queensferry Crossing**

The new Queensferry Crossing, the biggest infrastructure project in Scotland in a generation, has already in its first winter of operation proved its wind shielding makes it less susceptible to closure during high winds than the Forth Road Bridge. The new bridge is capable of carrying cars during winds gusting up to 100 miles per hour compared to 65 miles per hour on the older bridge. The Crossing's design features make it more resilient to severe weather conditions and a changing climate: the latest and most durable materials; cables that can be replaced with more ease as part of normal maintenance without closing the bridge; and a dehumidification system which reduces moisture and prevents corrosion.

### Scotland's future climate

Further warming of the climate is expected. Many of the impacts of climate change are already "locked-in" to the Earth's climate and will lead to changes for decades to come, no matter how successful global measures to cut greenhouse gas emissions are. Severe changes in the climate this century cannot be ruled out.

Temperatures in Scotland are projected to continue increasing over the next century, with hotter summers and milder winters. As well as further temperature rises, we can expect increasingly unpredictable and extreme weather, more and heavier rain days, particularly in winter, and increasing flooding risks to homes and businesses.

The opening messages from the first Independent Assessment of the Scottish Climate Change Adaptation Programme by the Adaptation Sub-Committee of the Committee on Climate Change in 2016 highlights the risks and opportunities facing Scotland:

*"Scotland's unique geography creates both resilience and vulnerabilities to the impacts of extreme weather and climate change. Scotland's iconic industries*

*including timber and whisky, and its fisheries, rely on the abundance of climate-sensitive natural resources. The projected changes in weather patterns combined with sea level rise will test the nation's transport, communication, fuel and energy networks and challenge the delivery of health and social care services. There will also be opportunities for Scottish businesses investing in the products, services and new technologies that will be needed to adapt urban areas and grow rural economies in Scotland.*

*“Scotland needs to prepare for the impacts of climate change. The climate in Scotland has already warmed and become wetter and further changes are inevitable in the coming decades due to greenhouse gases from human activity already released to the atmosphere. The Paris Agreement should mark the turning point in the global action needed to limit further warming. Otherwise temperature increases of 4°C or more by the end of the century would remain possible. Even two degrees of warming is associated with severe, pervasive and irreversible impacts for people and the natural environment.”*

### **New Climate Change Plan, Climate Change Bill and Energy Strategy**

2018 marked a huge step forward in Scotland's climate change ambition and action, with a new Energy Strategy in place, a new Climate Change Plan published, and a new Climate Change Bill introduced. The Climate Change Plan's commitments to increase our woodland creation target to 15,000 hectares per year by 2025, increase woodland cover from around 18% to 21% by 2032, restore 250,000 hectares of Scotland's degraded peatland by 2030, energy efficiency measures for housing, and continued efficiency improvements in Scottish agriculture, are all important contributors to both climate change mitigation and adaptation.

## **Case Study: Flooding – Scotland’s biggest climate risk**

Having invested over £300 million since 2008, in 2016 the Scottish Government committed to a further £420 million over a decade for local authority flood risk management measures.

The Selkirk Flood Protection Scheme was launched in February 2017. The scheme will protect approximately 600 properties (residential, business, agricultural, commercial and recreational) and critical infrastructure. The Scottish Government covers 80% of the estimated total cost of £31.4 million with the remainder being financed by Scottish Borders Council. The Selkirk Flood Protection Scheme won the Environmental Award at the Saltire Civil Engineering Awards last year. The Awards Panel was impressed with the multi-agency collaborative working which ensured multiple benefits were provided by the scheme, which has already protected properties from flooding on many occasions.

Elgin Flood Protection Scheme was launched in March 2017. The £86 million scheme is the largest civil engineering project to be undertaken in Moray. The Scottish Government covers 80% of the cost of the scheme. On 11 August 2014, whilst only partially completed, the scheme protected approximately 270 residential and 75 business premises from flooding, avoiding damages of an estimated £29 million.

Scottish Environment Protection Agency’s comprehensive programme on flood forecasting and warning includes: community engagement with Safer Communities partners; a new digital and radio campaign; and “RiverTrack” flood alerting pilot projects. Floodline provides live flooding information and advice to more than 26,000 people on how to prepare for, or cope with, the impacts of flooding. A daily Flood Guidance Statement is issued to over 500 emergency responders in Scotland.

The UK Water Act 2014 contains powers allowing for the introduction of a flood reinsurance scheme, known as “Flood Re”, which should ensure that flood insurance remains affordable to those who need it. Regulations came into force in 2015 and the scheme formally launched on 4 April 2016.

Tackling sewer flooding is a high priority for Scottish Water. In 2010-15 studies were completed in six cities including Glasgow. The new Storm Water Management Strategy, published in February 2018 recognises the need for more sustainable solutions to remove surface water from the sewers and manage it on the surface. Scottish Water has committed £170 million in 2015-21 to tackle sewer flooding.

## SCOTTISH CLIMATE CHANGE ADAPTATION PROGRAMME 2014

### The 2014 Programme

Scotland is responding to the climate challenge. Following the publication in 2009 of Scotland's Climate Change Adaptation Framework, Climate Ready Scotland, Scotland's first statutory five-year Climate Change Adaptation Programme, was published in May 2014.

The Programme aims *“to increase the resilience of Scotland’s people, environment and economy to the impacts of a changing climate”*. The programme was designed to address over 130 climate impacts through around 150 individual policies and proposals spanning three themes: natural environment; buildings and infrastructure; and society.

The Programme was informed by a three-month public consultation, scrutiny by the Scottish Parliament and a Strategic Environmental Assessment. Scottish Ministers report annually on progress on the Programme.

The Programme set out objectives, policies and proposals under three themes: (i) natural environment (ii) buildings and infrastructure (iii) society. At the heart of the Programme are Scottish Ministers' objectives, proposals and policies for addressing the key impacts identified for Scotland in the UK Climate Change Risk Assessment 2012.

The Programme contains a broad package of measures that:

- help Scotland adapt to the effects of climate change;
- create a more resilient country for us to live and work in; and
- help to protect Scotland's much loved natural environment.

#### **Case Study: Dynamic Coast: Scotland’s National Coastal Change Assessment**

Dynamic Coast is a multi-stakeholder project led by the Scottish Government, managed by Scottish Natural Heritage, carried out by the University of Glasgow and is funded by CREW (Centre for Expertise in Water). Phase one of the project forecasts coastal change to 2050 based on past erosion rates. Key findings: four-fifths of Scotland’s coastline is hard but 19% (3,802km) is soft and at risk of erosion. Scotland’s beaches and dunes play a vital role in protecting £13 billion worth of buildings and roads, more than twice the £5 billion currently protected by engineered seawalls. Natural defences currently protect 9,000 buildings, 500 km of road, 60 km of rail track, 300 km of water supply lines, and airport runways such as Islay.

The second phase (Jan 2018 to Dec 2020) is investigating the anticipated impact of climate change on future coastal erosion and erosion exacerbated flooding and developing Mitigation, Adaptation & Resilience Plans at “Super Sites”, including Montrose Bay, St Andrews and Skara Brae.

## Summary of progress to date

Since the introduction of the Programme, there has been increasing integration of adaptation into the Scottish Government's and public bodies' day-to-day business, in particular flooding, water supply, resilience, energy and planning. Adaptation has also increasingly been included within the core work of the wider public sector, including a long track record at Scottish Environment Protection Agency, Scottish Natural Heritage, Forestry Commission Scotland, Historic Environment Scotland and Marine Scotland.

Significant achievements and developments in climate change adaptation to date in Scotland include:

- £42 million annually from 2008 to 2026 for local authority flood protection schemes
- Scotland's Flood Risk Management Framework
- Mapping Flood Disadvantage report
- significantly improved data on coastal change with Scotland's National Coastal Change Assessment
- National Centre for Resilience
- the more resilient Queensferry Crossing, the biggest infrastructure project in Scotland in a generation
- Climate Change Plan commitments to improving the energy performance of our housing stock, restoring large areas of peatland and increasing woodland creation
- strong adaptation focus of key public bodies: Scottish Natural Heritage, Scottish Environment Protection Agency, Forestry Commission Scotland, Historic Environment Scotland, and Marine Scotland
- Risk Assessment of Historic Environment Scotland's Estate with 336 properties in care
- Climate change risk assessments in the NHS
- an estates review by the University of St Andrews
- a move from voluntary to mandatory public bodies reporting duties
- climate adaptation indicators
- the appointment of two Adaptation Research Fellowships to help address research priorities
- adaptation plan at Galloway and Southern Ayrshire Biosphere Reserve
- collaborative regional and city partnerships: Climate Ready Clyde, Edinburgh Adapts and Aberdeen Adapts
- EU consultation on its Adaptation Strategy

## **Case Study: Historic Environment Scotland - Climate Change Risk Assessment of Properties in Care**

Historic Environment Scotland has worked in close partnership with the British Geological Survey and the Scottish Environment Protection Agency to conduct a Climate Change Risk Assessment for the 336 Properties in Care on its estate.

In January 2018, Historic Environment Scotland published a major report on Screening for Natural Hazards to Inform a Climate Change Risk Assessment for the Historic Environment Scotland Estate. This study represents the first step in a comprehensive and on-going exercise to understand, monitor and manage environmental risk to the Estate. This study is part of on-going work to develop best practice and integrate climate change actions into operations, in line with the Public Bodies Duties under the Climate Change (Scotland) Act 2009 and Climate Ready Scotland: Scottish Climate Change Adaptation Programme.

The screening of climate related natural hazards has allowed Historic Environment Scotland to identify those sites most likely to be threatened by flooding, coastal erosion, and ground instability. The results of this study informed the Progress report on the conservation and management of properties in care of Scottish Ministers (January 2017), which led to a capital funding boost of £6.6 million for 2017-18 to support investment in conservation work, repairs and visitor facilities at several of Scotland's iconic heritage sites and monuments. The results of the risk assessment work have also underpinned the Annual Report on the Properties in the Care of Scottish Ministers (December 2017) and the new HES Asset Management Plan and Investment Plan, which were launched on 12 February 2018.

Read the full report on [the Historic Environment Scotland website](#).

## **Independent Assessment of Scotland’s Adaptation Programme**

An in-depth assessment of how well Scotland is preparing for climate change was commissioned by Scottish Ministers in the first Independent Assessment of the Scottish Climate Change Adaptation Programme by the Adaptation Sub-Committee of the Committee on Climate Change, which was laid before the Scottish Parliament in September 2016. This first statutory assessment took into account the Second Annual Progress Report and the Climate Change Risk Assessment Evidence Report.

The Adaptation Sub-Committee assessed 28 adaptation priorities and made 30 recommendations. Initial progress against these recommendations was set out in the Scottish Government’s third annual report to Parliament.

The Assessment found that the Programme was an important step and had made a positive start; many policies and plans already take account of climate change; commitments within the Programme are being fulfilled; and it provides a solid foundation for further progress. It confirmed that steps were being taken to prepare Scotland for climate change, with almost all of its 148 policies and proposals reported as being on track.

The Assessment noted some evidence gaps in important areas that make it difficult to determine whether key vulnerabilities are being suitably addressed and there was insufficient evidence to judge progress. Additionally, there is a need for more adaptation action, namely specific, effective steps to directly confront and tackle the risks highlighted. Further, it was noted that more could be done to make sure Scotland is ready to realise the opportunities that milder winters and warmer summers will bring.

### **Case Study: Scottish Natural Heritage world-first report on how climate change impacts Scotland’s geology 2018**

The research found that 97% of sites are in a favourable condition currently, with 73% at relatively low risk when it comes to climate change. However, 17% could be at moderate risk and 10% could be at high risk from climate change impacts. These impacts include increased erosion, coastal flooding, and changes in rainfall and storm frequency and intensity, changes in vegetation cover, and reduced freezing of the ground in winter.

## **NEXT STEPS: NEW CLIMATE CHANGE ADAPTATION PROGRAMME IN 2019**

The second statutory five-year Adaptation Programme will be published in 2019. Under the 2009 Act, the Programme must set out progress on the previous Programme, Scottish Ministers' objectives on adaptation, proposals and policies and their timescales, and arrangements for wider engagement.

The new Programme must address the risks for Scotland set out in the UK Climate Change Risk Assessment 2017 and its Evidence Report Summary for Scotland which identified six priority risk areas where action is needed in the next five years.

In developing the new Programme during 2018, the Scottish Government will build on the good progress made on Scotland's first Adaptation Programme, as reported in this Fourth Annual Report.

The Adaptation Sub-Committee recommended that the Scottish Government in preparing the second Scottish Climate Change Adaptation Programme should:

- address all urgent risks and opportunities for Scotland;
- identify a senior owner for each objective to be held accountable for its delivery
- list the specific actions that will be taken to achieve each objective together with appropriate milestones and timescales
- introduce an effective monitoring regime to allow impact of actions and delivery of each objective to be properly assessed
- present the actions being taken within each sector together and coordinate their delivery
- work with partners and build on the suite of ClimateXChange indicators to develop datasets where progress is most important and develop outcome-based indicators where this is possible.

The Adaptation Sub-Committee recommends an ambitious, focussed Programme of cost-effective actions and research, addressing all of Scotland's priority risks, moving beyond approaches of awareness-raising and capacity-building to concrete actions that measurably reduce our climate risks; and with clear ownership, timescales, co-ordination across themes, and mechanisms to track progress.

A second Independent Assessment from the Adaptation Sub-Committee has been commissioned by Scottish Ministers and is to be carried out in 2018, reporting in early 2019. This will be a key component in the development of the second Adaptation Programme.

The Scottish Government began the development of its second five year Programme in October 2017 with a workshop at Historic Environment Scotland's Engine Shed in Stirling.

We are currently exploring the scope for a more strategic, cross-sectoral, outcomes-driven systems approach (rather than the sectoral or risk/activity-based approaches taken by the 2009 Framework and 2014 Programme). The new Programme should promote co-benefits across wider policy objectives (economic growth, social justice, health and wellbeing etc.) and integrate adaptation into wider policy objective-setting and delivery.

## Climate Projections 2018

The UKCP18 Project is responsible for completing a major upgrade of the UK Climate Projections (UKCP09) using the latest observations, climate models and information from the most recent Inter Governmental Panel on Climate Change (IPCC) assessment. Scotland is well represented on the UKCP18 User Group for Government Departments and Other Government Organisations and the non-Government User Group for UKCP18. The Scottish Government and its partners will continue to work with the project team to ensure the projections are best designed to meet Scotland's user needs.

2018 will see the publication of new UK Climate Change Projections (UKCP18), informing the Government's third Climate Change Risk Assessment (due for completion in 2022). The UKCP18 project will update the UKCP09 projections over UK land areas and update UKCP09 projections of sea-level rise, giving greater regional detail, further analysis of the risks we face, both nationally and globally, and provide more information on potential extremes and impacts of climate change. UKCP18 is a major upgrade on the current set of projections (UKCP09) giving us the most up-to-date information on the future of our climate. It will help decision-makers assess the full range of risks from the changing climate and help other UK organisations that have to manage climate risks to their assets and operations.

## UK Climate Risk Assessment

The UK Government is required under the 2008 Climate Change Act to publish a UK wide Climate Change Risk Assessment (UKCCRA) every five years, assessing the 'risks for the UK from the current and predicted impacts of climate change'. The first UKCCRA was published in 2012.

In 2016, the Committee on Climate Change published the UK Climate Change Risk Assessment Evidence Report and Synthesis Report, and a National Summary for Scotland. In January 2017 the UK Government published the (second) UK Climate Change Risk Assessment 2017 including a contribution from Scotland.

The Evidence Report used the concept of urgency to summarise the findings of the analysis, variously identifying 'more action needed', 'research priority', 'sustain current action' and 'watching brief' categories. It highlighted:-

- the need for more action to address flood risks
- the potential for water scarcity
- heat related impacts on health and wellbeing
- risks to the natural environment
- risks of food price volatility
- new and emerging pest and disease risks, especially for Scotland's forestry.
- some actions identified as priorities for other parts of the UK have been shown to have a different urgency category for Scotland at this stage
- UKCCRA2 will feed into the development of the next UK National Adaptation Programme as well as the national adaptation programmes of the devolved administrations

## PROGRAMME HIGHLIGHTS OF THE 4<sup>TH</sup> ANNUAL PROGRESS REPORT

### NATURAL ENVIRONMENT

#### Peatland ACTION fund

Since 2013, over 10,000 hectares of peatlands have been restored through the Scottish Government-funded Peatland ACTION initiative, coordinated by Scottish Natural Heritage.

Peatlands cover around 20% of land in Scotland or around 1.7 million hectares. However, not all of Scotland's peatlands are in good condition. It is currently estimated that over 600,000 hectares of Scotland's peatlands are in a degraded condition as a result of historic land management decisions (drainage, burning and erosion). Degraded peatlands not only act as a source of greenhouse gas emissions, they have also lost their natural capacity to adapt to climate change (drought or flooding).

The restoration of Scotland's degraded peatlands can considerably reduce this source of greenhouse gas emissions, and ensure that this valuable habitat is able to adapt more easily to climate change.

Healthy peatlands help us adapt to and mitigate climate change by: providing conditions where new peat is able to form, thereby helping to restore natural processes; enhancing biodiversity and protecting the ground from further erosion; moderating flow rates and flood risk; and reducing water pollution thereby improving water quality (benefiting our fisheries and securing our drinking water supplies).

In addition, and perhaps more importantly, the work carried out by Peatland ACTION and eligible projects is helping to maintain, and where possible improve Scotland's natural carbon storage. Peat is a potential source of carbon dioxide and other greenhouse gasses, and as the peat dries out and erodes these gasses are released back into the atmosphere. By creating conditions where the peat can start to grow back, we can reverse this trend and store these greenhouse gasses instead.

Recent peatland restoration projects include:

- creating peat-pools to slow the flow of water, and trap and prevent sediments entering Sandy Loch an important drinking water loch in Shetland;
- gully bonding and ditch damming at Lochrosque (Highlands), to reduce water flow flashiness to increase run-of-river hydro-scheme efficiency, and trap and reduce the amount of sediment entering the drinking water treatment works;
- peat-hag re-profiling and sphagnum transplanting from 'borrow' areas on Beinn Dubh and Mid Hill high above the shores of Loch Lomond to help prevent further peat erosion and create a rich habitat for wildlife;
- ditch blocking and sphagnum transplanting from neighbouring 'borrow' areas on Hermanness National Nature Reserve to secure nesting habitat for the next generation of great skuas and other moorland birds.

All of these projects will help lock in CO<sub>2</sub> and other greenhouse gases (methane and nitrous oxide).

The strength of the Peatland ACTION fund lies in working collaboratively and learning-by-doing. Monitoring and reviewing the effectiveness of different restoration techniques informs adaptation to achieve the best results for the future of Scotland's peatlands.

#### **Fourth edition of UK Forestry Standard**

The UK Forestry Standard (UKFS) is the reference standard for sustainable forest management in the UK. It outlines the context for forestry, sets out the approach of the UK governments to sustainable forest management, defines standards and requirements, and provides a basis for regulation and monitoring – including national and international reporting.

Guidelines on how to meet the UKFS requirements include climate change, with good practice requirements for land managers on planning for future climatic change. The UKFS was reviewed and the fourth edition published in 2017.

#### **Plant Health**

A Chief Plant Health Officer for Scotland was appointed in February 2017; a milestone in securing effective collaborative effort across the research community. Scottish Government Rural and Environment Science and Analytical Services Division (RESAS) launched the Centre of Expertise in Plant Health in February 2018. The Centre aims to bring the best available plant health expertise into a virtual centre, to coordinate access by policy makers to expertise from across Scotland, and to enhance synergy of effort and to stimulate innovative thinking in support of plant health policy.

## **BUILDINGS AND INFRASTRUCTURE**

### **Flood risk engagement**

During 2017, SEPA continued to implement a comprehensive programme of flood risk engagement work including: direct marketing and community engagement for new flood warning schemes; and education and awareness work in partnership with Safer Communities partners. A new digital and radio advertising campaign related to forecast flooding was also introduced as were local 'RiverTrack' flood alerting pilot projects.

### **Scottish Water Storm Water Management Strategy**

Tackling sewer flooding is a high priority for Scottish Water, which is committing £170 million of investment to tackle the issue in the 2015-21 investment period. In the past Scottish Water has focused on building larger tanks and bigger sewers to deal with increasing volumes of surface water. While these will still be needed, the new Storm Water Management Strategy, published in February 2018, recognises the need for more sustainable solutions to remove surface water from the sewers and manage it on the surface. The launch of the Strategy is the start of a long term process; implementation will require Scottish Water to work in partnership with communities, local authorities and land owners.

Solutions that mimic natural drainage, including diverting roof and road water through channels to landscaped green spaces and ponds, use of permeable paving, and property level rain gardens form a central part of the new Strategy. These solutions will be tested through pilot projects in partnership with local authorities and communities. While traditional hard engineering solutions will remain an important aspect of storm water management solutions, the Strategy recognises a clear and increasing role for green and blue infrastructure.

Natural solutions are well suited to planning and building phased storm water management solutions. Phased solutions enable current sewer capacity issues to be addressed and incorporate flexibility to allow increased capacity to be created in future in response to changes in catchments such as increases in hard surfaces or increases in rainfall occurring as a result of climate change. This approach supports proactive management of flood risk rather than reacting to flooding when it occurs.

The Strategy is aligned with the requirements of the Flood Risk Management (Scotland) Act 2009 and associated sustainable flood risk management outcomes, including 'Rural and urban landscapes with space to store water and slow down the progress of floods'. A focus on 'above ground' natural solutions also has the potential to deliver wider benefits for communities who could benefit from better quality green spaces as well as enhanced flood protection.

### **Green Infrastructure Fund: Climate Change Adaptation**

Scottish Natural Heritage's Green Infrastructure Fund is using funds from the Scottish Government's European Regional Development Fund (ERDF) programme to improve the environment in disadvantaged parts of our towns and cities. Well-designed urban green space helps us adapt to and mitigate climate change, by restoring natural processes, managing run-off and flood risk, reducing air and water

pollution, alleviating urban heating and providing more space for nature.

The Fund will mean investment of around £38 million (40% from ERDF; the rest from match funding) in 15 major capital infrastructure projects by 2022. Seven projects are already underway, with another funding round due later this year. Projects include: using the Monklands Canal for water storage to control flood risk in North Glasgow; de-culverting of existing watercourses and wetland creation at Easterhouse in Glasgow and Middlefield in Aberdeen; new woodland, grassland and wildflower habitats at Blairbeth in South Lanarkshire and Southside in Glasgow, which will help absorb CO2 and other atmospheric pollutants; and surface water management across the Foresterhill hospital and university campus in Aberdeen.

Each project is important for its local community, but the strength of the Fund lies in pulling together the lessons, good practice and case study examples to demonstrate what can be achieved and encourage others to invest more in improving urban environments in future.

### **A82 Steep Ground Harvesting project**

The purpose of the A82 Steep Ground Harvesting project is to remove a serious risk to one of the main arterial routes of the Highlands. A catastrophic wind blow incident could result in hundreds of tonnes of trees being blown across the A82 fully blocking it. It is also likely that numerous rocks and boulders would be dislodged as a result of disturbance to root plates with much of this material either ending up directly on the road or left in a precarious condition above it. This would have both major short and long term safety, economic and reputational impacts.

The project has been successfully delivering operations for over 6 years in multiple locations across the National Forest Estate, and is forecast to continue until 2032. To date it has progressed safely and efficiently, all the while building capability within the forest industry as a whole for dealing with similar challenges into the future. The operations are amongst the most challenging in the UK and are held in high regard by stakeholders, including Transport Scotland, with the experience gained influencing the planning of other steep ground operations across the UK.

The post-harvesting plan for the project area is to re-stock with a variety of native species, planted at low densities, which will require much lower levels of future management and which will create a stable situation for the future.

### **The Engine Shed - Developing building conservation skills**

The Engine Shed, Scotland's dedicated building conservation centre, opened to the public on 3 July 2017. Run by Historic Environment Scotland, it serves as a central hub for building and conservation professionals and the general public. Our historic built environment is a finite and unique resource, yet its care calls for conservation skills that are in short supply. The importance of climate change adaptation is mainstreamed in this new learning and visitor resource. It will enable a greater understanding of traditional building materials and skills and inspire future generations to continue to care for Scotland's built heritage in the face of a changing climate.

## SOCIETY

### **Edinburgh Adapts – Helping Edinburgh Meet the Challenges of a Changing Climate – One Year On**

Councillor McVey, Leader of the City of Edinburgh Council, said in November 2017,

*“Along with all cities, Edinburgh will be profoundly influenced by the impacts of global climate change. We are strongly committed to continuing our adaptation work over the long term and seeing the Edinburgh Adapts vision become reality. Taking action to adapt will safeguard our treasured built and natural environment and enhance quality of life for residents and visitors. We will adapt in a way that delivers multiple benefits and supports our ambitions to reduce greenhouse gas emissions.”*

Implementation of the Edinburgh Adapts first five-year action plan began in 2016. Significant progress in the first year included pioneering approaches to green infrastructure and driving forward a step change in the management and maintenance of historic buildings.

Partnership working is key to the success of the Plan. Working together has enabled the sharing of knowledge, expertise and skills. A Steering Group of key organisations across the city is providing strong leadership and governance.

As well as delivering on adaptation, the Plan is helping to protect and enhance the city’s biodiversity and green and blue spaces. Green infrastructure is being promoted through the planning process and by partnership working, and practical examples of greenspace innovation is raising public awareness and understanding of the additional benefits that adaptation can bring to the urban environment.

Heritage organisations are working with local partners to manage the impacts of climate change on the city’s historic environment. The University of Edinburgh, who own a number of buildings in the city, including historic buildings, is taking a whole institution approach to adaptation and is in the process of finalising its first adaptation strategy.

Edinburgh is a coastal city and will be impacted by sea level rise and coastal change. The Edinburgh Adapts initiative has successfully begun to raise the profile of this issue through joint work with the Universities of Glasgow and Edinburgh, while the Royal Botanic Garden Edinburgh and Edinburgh Living Landscapes have undertaken awareness raising activity with local communities and schools.

Flooding has a huge impact on the city. Implementation of the Forth Estuary Local Flood Risk Management Plan 2016-2025 has begun and Edinburgh’s Braid Burn and Water of Leith Flood Prevention schemes are progressing well. A Surface Water Management Plan for the city will be completed in due course to assess current and future flooding risks from pluvial flooding.

At local level, community resilience groups are being established following the successful completion of the Edinburgh Community Resilience project which aimed to help neighbourhood areas enhance their capacity to respond to and recover from resilience incidents.

[Download the Edinburgh Adapts Vision, Action Plan and first year progress report](#) from the Adaptation Scotland website.

### **Aberdeen Adapts**

Aberdeen Adapts aims to help the city become more resilient to the impacts of climate change by creating its first climate change adaptation strategy. The project was selected for support from Adaptation Scotland following an open call for place-based partnerships in summer 2016. Jointly led by Aberdeen City Council and the University of Aberdeen, the project has used a wide range of engagement activities to collect views from local stakeholders on how best to prepare for the risks, and seize the opportunities inherent in our changing climate. A draft Aberdeen Adapts Action plan and governance options provide a strong foundation for action by partners in Aberdeen.

### **Climate Ready Business**

The past year has seen an increase in business engagement and understanding of the climate risks and opportunities. The Climate Ready Clyde initiative has pioneered research to identify the economic implications of climate change for Glasgow City Region, including the headline impacts of climate change on the City Region's economy and implications for key business sectors. Climate Ready Clyde is also developing an assessment of the City Region's 'adaptation economy', i.e. the goods and services that the City Region provides which support adaptation and resilience to climate change, and key areas for growth.

Clydeplan also played a pivotal role in ensuring Glasgow City Region's future economy, through development of their Strategic Flood Risk Assessment. The assessment analysed future flood risk to planned housing, strategic economic investment locations, industrial land, freight hubs and the City Region's strategic centres to help inform decision making for future development.

The novel, innovative approach won an award in the process category for the Scottish awards for Quality in Planning 2017. Adaptation Scotland published a new Climate Ready Business guide in partnership with the 2020 Climate Group, Scottish Enterprise and VisitScotland and supported two business engagement events including a successful business day held as part of the European Climate Change Adaptation Conference held in Glasgow in June 2017.

The VIBES Scottish Environment Business awards have added an adaptation award category and are working with Adaptation Scotland to increase awareness of business adaptation options as part of their engagement and events.

### **NHS Scotland Development of a Climate Change Risk Assessment Tool**

A group of NHS Board representatives have come together to develop a climate change risk assessment process, building on the work of NHS Highland who have been pioneering the approach. During 2017, NHS National Services Scotland, NHS Highland, NHS Lanarkshire, NHS Grampian, NHS Tayside and NHS Ayrshire and Arran have collaborated to develop a climate risk assessment process that will enable them to assess the impact of climate hazards and climate change, both now and to 2050, on service provision including the delivery of medical services and the health and safety of patients and staff. Consideration is also given to non-traditional

needs (i.e. beyond clinical care) the community may expect a health care facility to provide in the face of a severe weather related event. The aim is to develop a user friendly tool which will assist all NHS Boards in their assessment of climate risks and the identification of practical measures and safeguards. Guidance and training workshops are being developed and piloted in 2018 by the group and will be rolled out across all Health Boards.

The group is also working with Adaptation Scotland to adapt draft NHS Scotland specific guidance to take account of these new developments and to complement the national public sector guidance on adaptation.

### **New insights developed in understanding overheating risks in buildings housing vulnerable people**

ClimateXChange, with support from Health Facilities Scotland and Health Protection Scotland, completed a scoping study to identify how to monitor overheating risk in buildings housing vulnerable people in Scotland. This research is an important first step in identifying how the risk of overheating in these buildings could be monitored and managed in future.

### **Adaptation Scotland support programme**

Specialised support on climate adaptation is provided through the [Adaptation Scotland Programme](#), funded by the Scottish Government and delivered by sustainability charity Sniffer, and has supported important regional initiatives delivering on adaptation: the Galloway and Southern Ayrshire Biosphere Reserve, Climate Ready Clyde, Edinburgh Adapts and Aberdeen Adapts, as well as increasing engagement with the business community.

Adaptation Scotland will continue to play a key role in supporting wider engagement to deliver the Adaptation Programme. Through Adaptation Scotland, organisations, business and communities are supported to adapt to the impacts of climate change through connecting science and practice and building strong partnerships for planning and action.

Highlights for June 2017 – May 2018 include:

- Raising Scotland's profile and creating opportunities for international engagement through co-organising the European Climate Change Adaptation Conference, held in Glasgow and hosting a climate ready cities side event at COP 23.
- Delivering a successful Risk Assessment Task Group which enabled Historic Environment Scotland, Aberdeen City Council, NHS Facilities Scotland and Scottish Water to collaborate and complete comprehensive climate change risk assessments that are informing decision making across their organisations and sectors.
- Delivering a successful six-month Climate Ready Clyde Accelerator Course which contributed to increased adaptation planning and action and provided a platform for participants to continue collaborations through the Climate Ready Clyde initiative.
- A strong legacy from the Edinburgh Adapts initiative (which was co-developed with support from Adaptation Scotland) evidenced by the first annual progress

report on delivery of five year action plan and increased commitment and action among city partners.

- A draft Aberdeen Adapts Action plan and governance options developed providing a strong foundation for action by partners in Aberdeen.
- Increased engagement with the private sector including successful business engagement event, new business adaptation guidance published in partnership with Scottish Enterprise, VisitScotland and the 2020 Climate Group and inclusion of an adaptation commendation award as part of the VIBES awards.
- A refresh of public sector adaptation guidance is under way with input from across the public sector.
- Pilot projects testing creative approaches to engaging communities in adapting to climate change and supporting collaboration between organisations and communities.
- A diverse range of well received resources, events and training provided covering climate justice, business engagement with the cultural and tourism sectors, support for the universities and colleges sector and teaching resources for primary and secondary schools.
- Supporting strong links between research and practice through collaboration with ClimateXChange.
- Input to developing the next generation of UK Climate projections (UKCP09) and the National Coastal Change Assessment.

## **Adaptation Research Fellowships**

Scottish Government's Strategic Research funds the ClimateXChange Centre of Expertise, including two Research Fellowships dedicated to adaptation research. Adaptation Scotland supports strong links between research and practice through collaboration with ClimateXChange, input to developing the next generation of UK Climate projections and Scotland's National Coastal Change Assessment.

## **Climate Change Indicators**

ClimateXChange had by mid-2016 published 105 indicators measuring and monitoring progress in building a climate ready Scotland. The indicators support Scottish Government policy in three key areas: (a) inform and analyse risks identified for Scotland in the UK's Climate Change Risk Assessment; (b) show progress towards the objectives set out in Scotland's Climate Change Adaptation Programme; and (c) inform the independent assessment of the Programme by the Adaptation Sub-Committee of the UK Committee on Climate Change.

## **Public Bodies Duties**

The Scottish Government supports and encourages climate action from all public bodies in Scotland and recognises the key leadership role they have to play. 180 named public bodies are required to report annually on compliance with their climate change duties, including adaptation. 2016-17 reports have been published by Local Authorities, Further and Higher Education, National Health Service and others (including transport partnerships, police and emergency services, National Parks, Scottish Water, Scottish Environment Protection Agency and a range of other non-departmental public bodies).

## **Required Reporting for Public Bodies**

Further to section 44 of the Act, the Scottish Government introduced the Climate Change (Duties of Public Bodies: Reporting Requirements) (Scotland) Order 2015 requiring all named public sector organisations to submit reports on their compliance with their climate change duties under the Climate Change Act.

Named public bodies are now required to report annually on compliance with their climate change duties, including adaptation. Currently, 180 public sector organisations report annually under this legislation. The Scottish Government supports and encourages climate action from all public bodies in Scotland and recognises the key leadership role they have to play in tackling climate change and adapting to the impacts of climate change. The Scottish Government funds the Sustainable Scotland Network to act as a central gateway, providing support, resources and facilitating collaborative working.

2016-17 reports have been published by Local Authorities, Further and Higher Education, National Health Service and others (including transport partnerships, police and emergency services, National Parks, Scottish Water, SEPA and a range of other non-departmental public bodies). The reporting form captures information on the key emission sources and other governance, adaptation and sustainable procurement issues, including basic transport and business travel data.

### **3rd European Climate Change Adaptation (ECCA) Conference**

In June 2017, Glasgow hosted the 3rd European Climate Change Adaptation (ECCA) Conference, the first time ever in the UK, attracting around 1000 delegates from all over the world. Pioneering work on climate resilience in shaping investment in Glasgow and transforming communities helped win Glasgow the conference. The bid was supported by 46 organisations across Scotland and the UK. It marked the first time that the conference was held in the UK since its inauguration, with previous host cities including Hamburg and Copenhagen.

The Cabinet Secretary for Environment, Climate Change and Land Reform was amongst other high profile speakers, covering the conference theme of 'Our Climate Ready Future', the Climate Ready Scotland Exhibition (celebrating many of the adaptation case study highlights of the 3<sup>rd</sup> Annual Progress Report) was launched at the Conference and a day focussed primarily on considering businesses and innovation in adaptation.

The conference was recognized as an excellent opportunity to engage with European counterparts and we will continue to find opportunities to do so, to address both mitigation and adaptation challenges, and share knowledge and best practice.

### **British Irish Council Environment Work Sector**

The British Irish Council Environment Ministers met in Dublin in March 2018 to discuss climate change adaptation which has been added to the environment work programme for the next two years with a view to sharing experience and collaboration.

### **Scottish Government Climate Justice Fund**

The Climate Justice Fund was launched in 2012 with a focus on climate adaptation, and the first two rounds supported 11 projects in some of Sub-Saharan Africa's most climate-vulnerable communities.

### **Adaptation Scotland – International Engagement**

Adaptation Scotland raises Scotland’s profile and creates opportunities for international engagement e.g. through co-organising the European Climate Change Adaptation Conference in Glasgow and hosting a climate ready cities side event at the UNFCCC COP 23 climate conference in Bonn in 2017.

### **Traction Project**

The Scottish Government is supporting an adaptation competency framework being piloted by sustainability charity Sniffer and IIED (International Institute for Environment and Development) in Scotland and Malawi, two countries with very different adaptation challenges, which will be used as a tool to enable further peer learning between Scotland and a range of Least Developed Countries.

### **Agricultural Skills in Africa**

The Scottish Government Climate Change Team, International Development Team and SCIAF (Scottish Catholic International Aid Fund) are partnering on an agricultural skills training project for small scale farmers in Zambia.



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