

CLIMATE READY SCOTLAND: SCOTTISH CLIMATE CHANGE ADAPTATION PROGRAMME



SECOND ANNUAL PROGRESS REPORT 2016

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SCOTTISH CLIMATE CHANGE ADAPTATION PROGRAMME (SCCAP)

SECOND ANNUAL REPORT 2016

INTRODUCTION

The First Minister, who represented Scotland at the historic Paris climate conference in December 2015, said on 6 May that there is considerable agreement on stepping up our ambition to tackle climate change and protect our environment. We hope the Paris Agreement will avoid the worst impacts of climate change, which would inevitably fall on the poor and vulnerable at home and abroad. But Scotland's climate has already changed over the past 50 years and we expect that further change is inevitable, so adapting and being resilient to climate change is a very important part of our climate response.

Winter 2015-16 saw many communities in Scotland experiencing very serious flooding and damage from storms Desmond, Eva, Frank, Gertrude and Henry. Along with the severe weather of winter 2010-11, recent years have clearly demonstrated how important the climate is to Scotland. Climate change is expected to increase the frequency and severity of extreme events, but may also offer some opportunities. Government, the public sector, businesses, communities and members of the public all have a role to play in tackling and adapting to climate change.

2015 was the warmest year on record for the planet Earth: for the first time the global average temperature reached 1°C warmer than at the start of the twentieth century. UK land and sea surface temperatures have similarly increased, particularly since the 1970s. The global monthly average level of carbon dioxide (the main greenhouse gas) in our atmosphere passed 400 parts per million for the first time in March 2015.

The historic *Paris Agreement* in December is the first truly global action plan to avoid the worst impacts of climate change. The Agreement aims to limit global temperature rise to well below 2°C, and pursue efforts to limit temperature rise to 1.5°C. Current pledges by over 180 countries to cut greenhouse gas emissions could limit global temperature rise to around 3°C (although a wide range of outcomes is possible). The EU will cut its emissions by at least 40% by 2030 and take part in mechanisms to ratchet up global action in the years ahead. The *Paris Agreement* is an important step in encouraging other countries to match Scotland's level of ambition and action.

Scotland's leadership on climate change was praised by Christiana Figueres, the head of the UN climate body, when she visited Scotland in March 2016. Thanks to the efforts of everyone in Scotland, we have already cut our greenhouse gas emissions by 38.4% since 1990, much more than the 31.7% originally envisaged. We are well on the way to the target of a 42% reduction by 2020 set by the Scottish Parliament. We now generate 57% equivalent electricity demand from renewables,

and have delivered our 500 megawatts target for community renewables five years early and our 12% target for energy efficiency improvement was already at the required level in 2013, seven years ahead of schedule. The low carbon and renewable energy sector already employs more than 21,400 people.

Scotland has always seen adaptation as an important part of our climate response. The Adaptation Sub Committee (ASC) of the Committee on Climate Change is our independent adviser. The ASC will publish an independent report on adaptation in Scotland in September 2016.

A five-yearly update to the 2012 UK Climate Change Risk Assessment is underway, with new evidence to be published by the ASC on 12 July 2016 and the UK Government final report in January 2017. The aim is to help policy-makers by assessing the magnitude of risks and whether action is required in the next five-years. An evidence report for Scotland is being prepared.

Some headline results of the evidence report are already available. As a result of climate change, heavy rain and high river flows, especially in winter, will become increasingly likely and an increasing frequency and severity of flooding in the UK is to be expected. Seven of the ten wettest years on record for the UK have been since 1998, with trends towards increasing annual rainfall totals, particularly in Scotland and northwest England. Sea level rise and increased wave action on the UK coastline is expected to accelerate the process of coastal change. The Adaptation Sub-Committee has also commissioned studies on plausible but extreme risks as a form of “stress-testing” the UK’s adaptation plans.

In the course of the next year we will have the latest scientific advice on Scotland’s current and future climate risks, as well as independent advice on the direction we need to take to make sure Scotland can meet the challenges and opportunities climate change presents.

ADAPTATION PROGRAMME: HIGHLIGHTS and CASE STUDIES

Scotland's statutory Adaptation Programme, published in May 2014, has three themes:

- natural environment
- buildings and infrastructure
- society

As we reported last year, and as detailed in this highlights report and case studies (and annexed tables published separately online), work is underway in the vast majority of objectives and there is clear evidence of adaptation being integrated into plans and risk management, particularly in the public sector.

A broad range of major public bodies in Scotland are now required to report annually on compliance with their climate change duties, including adaptation. 2014-15 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).

Flooding is a key climate risk for Scotland. In 2015 the first ever round of Flood Risk Strategies were published. Through these the Scottish Government, Scottish Local Authorities and partners are committed to reducing flood risk across Scotland, with an action plan in the first 6 year cycle providing protection to 10,000 properties and proposals for 42 flood protection schemes or engineering works planned.

Winter 2015-16 saw significant flooding in communities across Scotland as a consequence of exceptional rainfall. The Scottish Government made available financial support to those affected and £140,000 is given annually to the Scottish Flood Forum to help publicise flood risk, preparation to reduce it and support those who may be affected.

Scotland has a strong focus on climate justice because climate change impacts most severely on poor people and vulnerable communities. The report *Mapping Flood Disadvantage in Scotland 2015* assesses social vulnerability for the key risk of flooding to help people working in flood risk management, resilience, emergency services, public health, social care, housing, and the environment.

The National Coastal Change Assessment is ongoing and is expected to conclude in September 2016. The data and maps collected during the project will support the flood risk management planning process.

Scotland's new National Centre for Resilience was opened at the Crichton Campus in Dumfries on 21 March 2016 as a centre of excellence focussing on natural hazards such as extreme weather and flooding. By bringing together practitioners, academics and communities, the aim of the Centre is to provide information and knowledge sharing and capability developments products and services (e.g. toolkits; guidance; improved forecasting).

In 2015 £3 million was identified for peatland restoration, additional to funding already within the new Scottish Rural Development Programme (SRDP). The additional £3 million will enable restoration of around 3,000 hectares.

Case Study

Glasgow and *Climate Ready Clyde*

Glasgow and the Clyde Valley are benefiting from a growing reputation as a climate resilient region where climate risks are understood and acted upon.

Glasgow – named as one of Rockefeller Foundation’s 100 climate resilient cities in 2014 - has continued its strong commitment to the benefits of a low carbon, climate resilient city. Climate resilience is at the core of decisions shaping investment in Glasgow and transforming communities.

The *Climate Ready Clyde* partnership of business and community organisations in the Glasgow and Clyde Valley region, with £100,000 Scottish Government support, will help a third of Scotland’s population and economy cope with climate change through adaptation measures, ensuring the region is well-placed to seize the economic opportunities associated with climate resilience. The *Climate Ready Clyde* project was set up by the Adaptation Scotland Programme and has already increased understanding of how changes in climate are likely to affect different organisations, services and sectors across Glasgow and the Clyde Valley region. Over 40 different organisations, businesses and community groups are taking part in the *Climate Ready Clyde* project.

Glasgow: a track record of success built on climate adaptation:

White Cart Water Flood prevention scheme is Scotland’s largest flood prevention scheme completed in 2011 at a cost of £53 million.

Seven Lochs Wetland Park is destined to become Scotland’s largest urban nature park and is an exemplar of green network planning.

Glasgow City Council and partner organisations are working to place climate resilience at the heart of land use planning for the east end of the city. The award winning east end local development plan, now part of the Clyde Gateway regeneration region, and the 2014 Commonwealth Games village are two examples of sites where green networks and sustainable urban drainage are at the heart of plans.

In 2017, Glasgow will host the *3rd European Climate Change Adaptation Conference*, attracting around 1000 delegates from around the world. The bid was supported by 46 organisations across Scotland and the UK. It will mark the first time that the conference has been held in the UK since its inauguration, with previous host cities including Hamburg and Copenhagen.

In Edinburgh, the *Edinburgh Adapts* project by Edinburgh Sustainable Development Partnership and Adaptation Scotland has been collaborating with 40 stakeholders, including Community Planning Partnerships, on an adaptation action plan, helping shape a vision for a climate resilient Edinburgh.

Adaptation Scotland will work with Aberdeen City Council and the University of Aberdeen to involve community, public and private sectors in an adaptation strategy that is owned and implemented by a wide range of partners.

Another of Adaptation Scotland's partnership projects, with the Galloway and Southern Ayrshire Biosphere, led to a published Climate Ready Biosphere vision and action plan.

Scotland's refreshed National Transport Strategy was published in January 2016, setting out the climate change policy context following the *Paris Agreement*.

A Climate Change Impact Assessment has been undertaken of each NHS Area Health and Special Board in Scotland. Flood risk assessments have been prepared for 250 key health care sites across NHS Scotland.

Scotland's Biodiversity – a Route Map to 2020, published in June 2015, identifies climate change as one of the seven key pressures on biodiversity. Targeted action is set out in the Route Map to address these key pressures and to assist in meeting our international biodiversity obligations

The *Strategic Research Programme 2016-2021* which commenced in April 2016 includes continued support for ClimateXChange, Scotland's Centre of Expertise on Climate Change, which provides advice on mitigation and adaptation policy across all sectors of the Scottish economy.

ClimateXChange has worked with Scottish Government, its agencies and other experts, to develop indicators to monitor climate change adaptation in Scotland, covering the natural environment (agriculture, biodiversity and forestry), buildings and infrastructure and society themes represented in the Scottish Climate Change Adaptation Programme. The monitoring will help policy makers and others understand how well Scotland is adapting to climate change, highlighting where successful adaptation is occurring and where policy action may be needed to encourage and strengthen adaptation.

Case Study

NHS Highland – adapting to climate change

NHS Highland provides services across a huge variety of diverse communities including urban centres and extending to some of Scotland's most remote rural and Island communities.

Climate change impacts are already affecting the Highlands and Islands and will pose significant challenges to delivering NHS Highland services. Many actual and potential impacts have been identified, including increased risk of structural damage to hospitals and health centres and, damage to essential road and energy infrastructure impacting delivery of services to patients.

NHS Highland's Environmental & Sustainability Team is taking a strong and proactive response to increasing awareness and managing climate risks. Senior management have acknowledged the seriousness of the risks posed by a changing climate and have involved a wide range of experts in assessing and managing climate risks. Climate impacts have been identified and future climate risk assessments are being developed.

NHS Highland is also working in partnership with Health Facilities Scotland to share lessons about their work with other Health Boards and have made valuable contributions to a dedicated Risk Assessment Task Group run by the Adaptation Scotland Programme.

Case Study

Dumfries and Galloway Council - local authority services and adaptation

Dumfries and Galloway Council Priorities are at the heart of council services. They are based on improving the region's economy and ensuring better lives for children and other vulnerable groups. To understand the challenges and opportunities of the impacts of climate change to delivery of those Priorities, Dumfries and Galloway Council are using the knowledge and skills gathered at Adaptation Scotland's Adaptation Learning Exchange and their key resource for public bodies "Five steps to managing your climate risks".

Progressing Step 2: 'Assess climate threats and opportunities', Dumfries and Galloway Council's Sustainable Development Team is working with Service Managers across the council to consider how critical services have been affected by current weather e.g. recent extreme weather events. The Council are beginning to consider future climate trends and impacts and increase understanding of vulnerabilities with the focus on Council Priorities.

Dumfries and Galloway Council are aiming to achieve a solid foundation for Step 3: 'Identify risks to be managed and plan actions' and to build in work towards Step 4 'Report and implement' and Step 5 'Monitor and review'.

During the preparation of the Council's first climate change duties report in 2015, they found that several strategies and plans already address climate-related risks and opportunities. Any planned strategy and policy revision dates are seen as opportunities to ensure climate change adaptation is embedded. The reshaping of the council includes a review of service risk registers and business continuity plans and the Sustainable Development Team have identified that this presents a further business planning avenue to address climate risks. Dumfries and Galloway Council are also investigating how to improve the guidance for the Impact Assessment toolkit to include climate change adaptation.

Dumfries and Galloway Council are playing a very active role in sharing knowledge and building partnerships to support adaptation and welcome invitations to collaborate on any of their approaches.

Case Study

Historic Environment Scotland – adapting traditional buildings

Historic Environment Scotland has published some advice for owners of historic and traditional buildings on measures to increase building resilience and address defects associated with a changing climate.

The new publication, called 'Climate Change Adaptation for Traditional Buildings' outlines how changed weather, especially increased rainfall, is putting additional pressure on buildings of all ages and types, but particularly traditionally built mass masonry structures that are characteristic of much of Scotland's urban and rural landscape.

Many traditional and historic building types were designed with features that increased resilience and the ability of a structure to handle and shed liquid water, but understanding of these details has been lost. The use of some modern materials in repair and maintenance can also make problems worse. The traditional features that enhance resilience are described, both in terms of how they look and how they work. However, it is accepted that some change will be required in some places. These vulnerable areas of older buildings are considered, and measures for their repair and upgrade are described. Generally this focusses on upper level masonry such as chimney and gables, but other parts of the building are also described. Historic buildings can be changed, if the work is appropriately detailed and carried out. There is also comment on other climate change impacts such as river and pluvial flooding, along with ways of minimising damage and risk to older structures.

Historic Environment Scotland is also sponsoring several site projects focussing on climate change adaptation measures for older buildings to demonstrate the measures described in the publication. This will involve the re-instatement of traditional finishes and the improvement of certain features such as the tops of chimneys and high level masonry details.

In one recent case in Shetland, the wet gable of a house in a very exposed location was repaired and upgraded; it is now fully dry. Other projects will look at improvements to different building types, including a church building, a tenement and farm cottage. Once work is complete, these site projects will be written up as 'Refurbishment Case Studies', where other designers and the public can see what has been successful and what has been done in detail.

Case Study

Balruddery Farm - Farming for a Better Climate

Farmers have always had to work with the weather, but over the past few years they are seeing more unpredictability, for example colder wetter springs and warmer autumns, making the job much harder to plan for.

Adapting to climate change is becoming part of routine business in farming. By taking steps now, such as securing water supplies for irrigation or reducing soil erosion risks, risks from climate change can be reduced.

Measures taken at Balruddery Farm to adapt to climate change include :-

- Tied ridges in potato crops. The ridges help crop and soil management in both dry and wet conditions, as irrigation water can be held in the drills at drier times and helps to apply irrigation more accurately and uniformly over a sloping field. This enables better use of water and prevents or reduces runoff taking water, nutrient and soils off the farm.
- Avoiding Compaction. Working alongside scientists studying soil compaction has made it easier to understand the need to avoid working land in poor conditions or with the wrong equipment.
- Better use of water for irrigation. Both drought and low rainfall can be issues for potato crops, especially at establishment and tuber development. At Balruddery a borehole and a ring main irrigation system have been installed to channel water to all of the fields; enabling efficient watering of crops during dry spells.
- Reducing erosion risks. At Balruddery they have recently started to drill commercial crops across the slope to try to prevent erosion, particularly on winter sown crops.
- Reducing storm damage. They have established new hedge rows and tree lines which are used as natural wind breaks to protect the polytunnels from the prevailing north-westerly winds.

More information on this and other case studies can be found at www.farmingforabetterclimate.org

Case Study

SNH - demonstrating principles for helping nature adapt

Scottish Natural Heritage has published eight principles for helping nature adapt to climate change (published in the updated 2016 [Climate Change and Nature in Scotland](#)). These address issues of uncertainty, resilience and accommodating change in managing nature.

Adaptation Principles – helping nature adapt to climate change

- 1 Reduce other pressures** on ecosystems, habitats and species – e.g. pollution, unsustainable use, grazing, habitat fragmentation and invasive non-native species.
- 2 Make space for natural processes** including geomorphological, water and soil processes, and species interactions.
- 3 Enhance opportunities for species to disperse** by reducing fragmentation and increasing the amount of habitat available.
- 4 Improve habitat management** where activities such as grazing, burning or drainage cause declines in diversity or size of species populations, or where modifying management or increasing habitat diversity could improve resilience to climate change.
- 5 Enhance habitat diversity**, e.g. by varying grazing or plant cutting management on grassland or moorland, or creating new habitats on farms.
- 6 Take an adaptive approach to land and conservation management** e.g. by changing objectives and management measures in response to new information.
- 7 Plan for habitat change** where assessments indicate losses of habitats or species are inevitable, for example as a result of sea-level rise.
- 8 Consider translocation of species** in circumstances where assessments indicate the likely loss of a species despite new management measures, and where there are suitable areas for nature to adapt.

The principles are illustrated by eight [climate change adaptation case studies](#) across a range of Scottish habitats, from the uplands to coastal saltmarsh, particularly on National Nature Reserves. They show how we can adapt management practices to respond to the challenge of climate change, in ways that support nature's role in helping us cope with a changing climate.

Case Study

“Greener Gardens”

The Scottish Government has been working in partnership with Central Scotland Green Network Trust, Taylor Wimpey West Scotland and academia on an innovative ‘Greener Gardens’ project that looks at how the gardens of new homes can be used to contribute to green infrastructure, biodiversity and storm water management.

The project features a number of strands - all designed to encourage the development of sustainable places – including installation of demonstration rain gardens, academic research, provision of water butts as part of the package for new homeowners, and awareness raising by promoting the benefits of rain gardens both to homeowners and the wider house building industry.

Together with project partners – C&D Associates, Abertay University and Central Scotland Green Network Trust – Taylor Wimpey has installed two types of rain garden and a ‘SUDS-in-a-box’ (Sustainable Urban Drainage System) at its Torrance Park development of new homes in Holytown, North Lanarkshire. As part of the project, Taylor Wimpey is also funding two years of research of the installation by project partners Abertay University to further investigate how source control SUDS in new housing developments can contribute to storm water management and reducing downstream flooding. The project is leading the way in innovation within this area for the housebuilding industry, with the project being recognised in the 2015 VIBES (Vision in Business for the Environment) Awards.

Case Study

Edinburgh Adapts – creating a vision, planning action.

Steeped in history, Edinburgh is a strong, vibrant and resilient city renowned for its beauty and creativity. In spite of its many strengths Edinburgh is not immune to social, economic and environmental challenges. The impacts of climate change will make these challenges more difficult to address and will also bring new challenges and opportunities.

Edinburgh Adapts is a joint initiative by Adaptation Scotland and the Edinburgh Sustainable Development Partnership (ESDP). Adaptation Scotland led the partnership in co-developing a framework to achieve its aim of creating a city-wide Action Plan and Vision to drive Edinburgh's adaptation journey.

Beginning in spring 2015, this place-based project has brought together over fifty stakeholders from businesses, public agencies and community organisations at five innovative workshops and a series of one-to-one meetings. As a result, in summer 2016 Edinburgh Adapts will publish the city's first Adaptation Action Plan and Vision. The plan will run from 2016-2020 and contains over 100 committed adaptation actions and over 20 further aspirational actions. The Vision sets out the project partners' adaptation aims for two key landmark dates, 2025 and 2050, and illustrates the benefits of becoming a climate ready city.

Edinburgh Adapts was instrumental in Edinburgh securing a place on the EU Mayors Adapt city twinning programme, contributed to the city being included in two high value Horizon2020 funding bids, and continues to draw new interest from external partners, with a further event on coastal adaptation mooted for later this year.

A strong focus on cooperative action has pushed adaptation into new areas, with the city council's Biodiversity Action Plan now also including adaptation actions in turn, and has built new partnerships around adapting historic buildings, extending permeable paving and more. A dedicated Steering Group drawn from key actors in the action plan has now taken over leadership of the project. This Steering Group will report progress on the Action Plan to the ESDP, ensuring the city's adaptation agenda is self-owned and self-directed.

Reflecting on the benefits of the project, Councillor Lesley Hinds, Chair of the Edinburgh Sustainable Development Partnership, said: *"In Edinburgh we are working to take action on climate change in line with Sustainable Edinburgh 2020, which envisages a low carbon, resource-efficient future for the capital.*

"By working closely with Adaptation Scotland on the Edinburgh Adapts Project, the Edinburgh Sustainable Development Partnership has been able to enhance collaboration between key organisations and communities to develop an Adaptation Action Plan that truly benefits all stakeholders."

Are We Ready? case study

Talking about the weather is something that many of us do every day. We all notice the weather and discussing how it affects us can be a good way to open up a wider conversation about climate change.

Are We Ready? is a resource for communities to talk about our changing climate as a starting point for getting climate ready. People using the resource don't need to be climate change experts; the film and information sheets provide all the information needed and the workshop guide provides a step by step guide to running a useful and interesting discussion.

Are We Ready? has been developed by the Adaptation Scotland programme, in partnership with the Scottish Communities Climate Action Network (SCCAN). SCCAN have trained members to use the resource in their communities and are promoting it across their network. Are We Ready? workshops can be run with different community groups and have been valuable in raising awareness of the need to adapt to local impacts and reduce emissions. The workshop has also helped people to begin developing ideas for projects to help build local resilience.

“As a direct result of an Are We Ready? Workshop, Greener Col Glen has been running for about two years now. After the initial workshop we had a series of meetings where we scoped out projects and discussed what we wanted our community to look like in 2050. At least 20% of households in the village are now able to grow some of their own food rather than make a 40 mile round trip to the nearest large town. We have also started turning invasive rhododendron in to wood fuel and have lots of other projects being developed” **Sarah Maclean, Greener Col Glen Coordinator**

Download the Are We Ready resources from the Adaptation Scotland website:
<http://www.adaptationscotland.org.uk/5/116/0/Are-We-Ready.aspx>

ADAPTATION PROGRAMME: NEXT STEPS

Adaptation Scotland Programme

The Adaptation Scotland programme will continue to play a key role in supporting wider engagement to support delivery of Scottish Ministers' climate change adaptation objectives as set out in the SCCAP. The Adaptation Scotland Programme will continue to mainstream climate adaptation, delivering an embedded approach across public, private and community sectors and all Scottish Government portfolios, with the aim of achieving measured reductions in adaptation risks.

Required Reporting for Public Bodies

Named public bodies are now required to submit their first report for the period from 1 April 2015 to 31 March 2016 by 30 Nov 2016, and each year thereafter.

The new required reporting form will capture information on the key emission sources and other governance, adaptation and sustainable procurement issues, including basic transport and business travel data. The "recommended" reporting form provides further opportunities for bodies to voluntarily record area-wide emissions, behaviour change and resource efficiency information. Both sets of reported information will be annually assessed to help monitor compliance with the duties and build up a clear picture of sector activity and progress in order to inform Scottish Government policy and support in the future.

Independent Report by Adaptation Sub-Committee, September 2016

In addition to annual progress reports by Scottish Ministers to the Scottish Parliament, the Climate Change (Scotland) Act 2009 requires an independent assessment of the Scottish Government's progress. The Adaptation Sub-Committee (ASC) of the UK Committee on Climate Change is currently designated to perform this independent scrutiny role. The first report is expected in September 2016 and will be laid before Parliament.

Climate Change Risk Assessment, January 2017

The UK Climate Change Risk Assessment (CCRA) is a five-yearly assessment of the current and future risks and opportunities to the UK from climate change. The second CCRA is due in January 2017. To inform the 2017 risk assessment, the Adaptation Sub-Committee (ASC) of the Committee on Climate Change will publish an independent evidence report of the risks and opportunities to the UK from climate change by July 2016. Defra will then use the ASC's evidence report as the basis of a Government report, which will be laid before Parliament by January 2017. The Scottish Government will continue to work with the UK Government and other devolved administrations in the production of the next CCRA which will form the basis of the next Programme.

European Climate Change Adaptation Conference 2017

In 2017, Glasgow will host the 3rd European Climate Change Adaptation (ECCA) Conference, attracting around 1000 delegates from all over the world. Climate resilience is at the core of decisions shaping investment in Glasgow and transforming communities and it is this pioneering work that has helped win Glasgow the conference. The bid was supported by 46 organisations across Scotland and the UK. It will mark the first time that the conference has been held in the UK since its inauguration, with previous host cities including Hamburg and Copenhagen.

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.

ADAPTATION PROGRAMME: BACKGROUND INFORMATION

Paris Climate Agreement

The Paris Agreement provides certainty about the global low-carbon future in the same way that the Climate Change Act (Scotland) in 2009 provided certainty for Scotland's low-carbon future. The Agreement provides a clear international context for Scotland's action on climate change.

The Paris Agreement puts a strong emphasis on adaptation and resilience. It puts adaptation on a par with mitigation, and links the two. The Agreement sets a global goal of "enhancing adaptive capacity, strengthening resilience and reducing vulnerability to climate change, with a view to contributing to sustainable development and ensuring an adequate adaptation response in the context of the temperature goal".

All countries are expected to undertake adaptation planning and action, and communicate those actions to the global community.

The Paris Agreement recognises the important role of "non-state actors" - including devolved, state and regional governments, cities, businesses, and the public – who we expect will be strong drivers of a progressive climate agenda in the years ahead.

Scotland's Climate Actions

Scotland has signed the Under 2 MOU, an initiative of the governments of California and Baden-Württemberg, pledging to cut emissions by at least 80% by 2050. A total of 128 jurisdictions representing 28 countries and six continents have signed or endorsed the Under 2 MOU. Together, they represent more than 740 million people and \$20.7 trillion in GDP, equivalent to more than a quarter of the global economy.

Scotland has also signed the Compact of States and Regions, which pledges us to report on progress on emissions cuts to the international community. The Compact currently has the support of 44 governments together representing one eighth of the global economy, which by 2050 aim to cut emissions equalling world greenhouse gas emissions in 2012.

Scotland is playing its part in assisting vulnerable communities in poorer countries adapt to climate change. At the Paris conference, the First Minister pledged a further doubling of our climate justice support for some of the world's poorest people, with £12 million over four years. £6 million has been given previously from our innovative Climate Justice Fund for 11 water adaptation projects in Malawi, Zambia, Tanzania and Rwanda. In addition, £3.8 million has been given from our International Development Fund since 2012 for community energy projects in Malawi. In Africa, Malawi suffered its worst flooding in memory in January 2015 and Scottish-funded boreholes helped reduce the incidence of cholera and saline water after those floods.

Adaptation Annual Report

Section 54 of the Climate Change Act (Scotland) 2009 requires Scottish Ministers to provide an annual report on progress towards achieving the objectives and implementing the proposals and policies set out in the Programme.

This second report provides an update of the progress set out in the Programme since the first progress report published in May 2015.

This report is not an in depth assessment of how well Scotland is preparing for climate change. The Adaptation Sub-Committee of the Committee on Climate Change (ASC) has been asked to prepare an independent assessment, due to be published in September 2016, which will evaluate Scotland's preparedness, based on assessing the implications of trends identified by indicators developed by ClimateXChange, alongside reviewing the long-term decision-making of key actors. This will allow the ASC to reach a judgement on whether the Programme is putting in place a policy framework that will enable an appropriate level of adaptation over the time period of the Programme and beyond.

Scottish Climate Change Adaptation Programme

Scotland's first statutory climate change adaptation programme (2014) sets out the Scottish Government's on-going commitment to ensuring Scottish Government policy, as far as possible, helps Scotland adapt to the effects of climate change. It contains a comprehensive package of measures that:

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

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 (to be updated in January 2017).

The objectives set the long-term framework for adaptation in Scotland and the proposals and policies provide the focus for the lifetime of this Programme in order to progress towards these long-term objectives.

We are working to achieve our national adaptation objectives not only through integrating adaptation within Scottish Government policies, but through encouraging and facilitating partnership working across organisations, businesses, the public sector and individuals across Scotland.

And we are building partnerships to improve our understanding of the impacts of climate change. Where we need to continue to build the evidence base, our policies need to be flexible to respond to new information as it becomes available.

Adaptation Scotland Programme

The Adaptation Scotland programme continues to support organisations, business and communities to adapt to the impacts of climate change through connecting science and practice and building strong partnerships for planning and action.

The Adaptation Scotland programme supports strong links between researchers, policy makers and practitioners. New research on 'Financing Infrastructure and Built Environment Adaptation to Climate Change' (Roilech K, October 2015) has been published in partnership with ClimateXChange, the University of Leeds and the ARCC network. This work has been used to raise awareness of opportunities and barriers to financing action and, included as evidence in the current UK Climate Change Risk Assessment.

The Adaptation Scotland programme has supported the introduction of mandatory reporting against the Public Bodies Climate Change Duties. The programme produced the adaptation reporting questions and associated guidance and ran training for Sustainable Scotland Network members to encourage submission of voluntary reports in October 2015.

Building capacity for organisations, businesses and communities to adapt to climate change

The Adaptation Learning Exchange, run as part of the Adaptation Scotland Programme, continues to build capacity and bring adaptation leaders together to develop solutions. Major public sector organisations including Scottish Water, Historic Environment Scotland, Aberdeen City Council and Health Facilities Scotland are members and have worked together to make significant progress with assessing climate risks.

A growing network of community and public sector partners are being equipped through the Adaptation Scotland programme to engage communities in adapting to climate change. For example, partnership work with Planning Aid for Scotland (Pas) is enabling communities to discuss adaptation as part of Charrette*plus*TM community engagement projects. New workshop resources produced with the Scottish Communities Climate Action Network (SCCAN) are enabling SCCAN members to hold community conversations and identify ways in which communities can increase resilience and adapt.

Creating and supporting collaborations and partnerships for adaptation

Adaptation Scotland's partnership projects are enabling joint action and collaboration. The programme's work with the Galloway and Southern Ayrshire Biosphere has led to a published Climate Ready Biosphere vision and action plan.

ADAPTATION PROGRAMME: KEY DEVELOPMENTS

This annex gives some more information about key Scottish Government policies in each of the Adaptation Programmes main themes. Fully detailed progress updates for each priority of the Programme will be published separately on the Scottish Government website.

CLIMATE READY NATURAL ENVIRONMENT THEME:

A Scotland with a productive, healthy and diverse natural environment which is able to adapt to change.

Biodiversity

- Scotland's Biodiversity – a Route Map to 2020 published in June 2015.

Land Use

- Land Use Strategy published in March 2016.

Research

- Strategic Research Programme commenced 2016-2021, including resilience of natural assets and support for ClimateXChange.

Forestry

- Forestry Grant Scheme launched in 2015
- Long term planning for climate impacts to inform planting decisions
- Ongoing funding for tree health research

Marine

- National Marine Plan published in March 2015 including specific objectives and policies for climate change adaptation.
- First two Marine Planning partnerships established.

Rivers and Coasts

- Flood Risk Management Strategies published in December 2015.
- Second River Basin Management Plans published in December 2015.

Agriculture and Food

- Report on five-year food security programme due in 2016 and new five-year programme commenced.
- Extending activities under the 'Farming for a Better Climate' programme. 36 events run by FFBC throughout 2015-16 attracting around 1000 attendees.

Animal and Plant Health

- Scottish Plant Health Strategy published in March 2016.

CLIMATE READY BUILDINGS AND INFRASTRUCTURE NETWORKS THEME:

A Scotland with well-managed, resilient infrastructure and buildings providing access to the amenities and services that we need.

Flood Protection

- Flood Risk Management Strategies published in December 2015.
- Online Planning Advice on Flood Risk published June 2015.

Transport

- Scotland's refreshed National Transport Strategy was published in January 2016, setting out the climate change policy context following the *Paris Agreement*.

CLIMATE READY SOCIETY THEME:

A Scotland with strong, healthy, resilient communities which are well informed and prepared for a changing climate.

Flooding

- Scottish Government published research to identify and map flood disadvantage in Scotland in December 2015.
- Continue to provide funds to SEPA to support the Scottish Flood Forecasting service.
- Flood Risk Management Strategies published in December 2015.

- Continue to fund Scottish Flood Forum which works directly with communities to raise awareness of flood risk and help protect families and homes.
- Scotland's Fire and Rescue Services continue to train water rescue and flood responders to a high level.

National Infrastructure

- Risk resilience assessments have been carried out with a range of key stakeholders across the critical infrastructure sectors.

Fuel Poverty

- Share of homes rated EPC band C and above has increased 71% since 2010 and 11% in last year.

Building Resilience in Communities

- National Centre for Resilience, based in Dumfries, opened formally in March 2016. This will help build our understanding of the effects of climate change on people, homes and communities.
- ReadyScotland.org website continues to be updated and improved.
- Scottish Guidance on Community Resilience published on ReadyScotland.org website.

Public Body Adaptation Plans

- A Climate Change Impact Assessment has been undertaken of each NHS Area Health and Special Board in Scotland.
- Flood risk assessments prepared for 250 key health care sites across NHS Scotland.



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