



Scotland's centre of expertise connecting climate change research and policy

ClimateXChange
Centre of Expertise on Climate Change

Annual Report 2014-15

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EXECUTIVE SUMMARY

In our fourth year of operation ClimateXChange has engaged with a greater number of stakeholders and Scottish Government policy teams as our portfolio of projects has matured. We can also see tangible evidence of the value of our work in published policy documents and current policy debate.

We have continued to build a genuinely collaborative approach to project scoping and co-production of knowledge. Close working relationships with a range of Scottish Government policy portfolio teams allowed us to pre-empt research needs as well as to proactively propose research and engagement work where we saw an emerging need.

Energy policy is an example of this. In response to an increase in policy-driven questions on energy, we expanded CXC's capacity to include four new Post-Doctoral Fellowships focused on aspects of the Scottish energy system.

Our research on community investment in commercial energy schemes was directly referenced in the Scottish Government's Public Engagement for Sub-20MW Wind Turbine Proposals Good Practice Guidance document.

CXC has also been central in developing the new National Centre for Resilience, taking on a leading role in developing this collaboration between a range of specialists and experts.

As the centre of expertise matures we are increasingly developing large and complex projects that require significant investments in terms of project management and Secretariat time. Examples here are our projects on citizens' juries on onshore wind farm development and the study of visual, noise and shadow flicker impact from wind farms. The outcomes from such projects are much more powerful than those from smaller projects or more ad hoc activities but they require careful planning of management and resource inputs.

CXC has been central in developing Scotland's reputation as an international leader on climate change. Along with the Edinburgh Centre for Carbon Innovation, we hosted the first meeting of the Committee on Climate Change ever to be held outside of London, creating an important arena for the Committee to engage with key Scottish stakeholders.

We were also asked to present the IPCC Fifth Assessment Report findings and implications for Scotland to the Scottish Government, demonstrating our ability and value in connecting practical policy work with international developments on climate change research.

2. EXTERNAL CONTEXT

The Scottish Government remains committed to achieving a 42% emissions reduction by 2020 and this ongoing commitment set the scene for CXC's research on mitigation. Significant progress has been made in reducing emissions in 2014-15. By Spring 2015, however, Scotland had missed its statutory emissions reduction targets for three years running.

The divergence between UK and Scottish energy policy – which we noted in our 2013-14 Annual Report – continued in 2014-15. Scotland increasingly emphasised exploring the implications of a more decentralised energy system, culminating in the launch of the Local Energy Challenge Fund. Through its draft heat generation policy statement (Heat Strategy), the Scottish Government further signalled its ambition to link local energy supply and demand, and stimulate innovation in the energy system at local and regional scale. This focus on decentralised energy pathways framed much of CXC's energy research in 2014-15. CXC engaged with end users on emerging policy priorities and questions, developing and delivering research projects that speak to the key issues at hand. In response to policy-driven questions on energy, we expanded CXC's capacity to include four new Post Doctoral Fellowships focused on aspects of the Scottish energy system.

On adaptation, there were two key external drivers for CXC's work. Firstly, the evidence gathering for the second UK Climate Change Risk Assessment, which will form the basis for the second Scottish Climate Change Adaptation Programme (SCCAP). The Committee on Climate Change's Adaptation Sub Committee (ASC) is managing the Risk Assessment. Secondly, the ASC set about amassing evidence to underpin its first statutory assessment of progress against the SCCAP. CXC has been working to support both projects through providing robust evidence generated in projects that respond to the needs of key policy stakeholders.

The substantive Scottish Government lead for CXC remained the energy and climate change team in the Office of the Chief Economic Adviser (OCEA). We continued to engage closely with OCEA analysts and with RESAS. There was some restructuring of energy and climate policy teams in 2014-15 and CXC worked hard to ensure we maintained and strengthened relationships with key policy leads, keeping abreast of changing portfolios. Towards the end of 2014-15, policy teams began considering their evidence needs for the third Report on Proposals and Policies. We were responsive and adjusted our project plans through dialogue with key policy teams.

We built up our engagement with the UK Energy Research Centre (UKERC) as it entered its third phase, helping to shape UKERC's research agenda as it pertains to Scotland and building the relationship between UKERC and the Scottish policy community.

Scottish Ministers announced the creation of a National Centre for Resilience in 2014. CXC was active in designing and developing the centre, with our Policy Director nominated to the Programme Board and chairing the research working group.

3. INTERNAL CONTEXT

CXC has continued to build on the progress in 2013-14, and embed a genuinely collaborative approach to project scoping and co-production of knowledge. In 2014-15, the Secretariat and CXC researchers were in regular contact with a broad range of policy users, maintaining strong working relationships across Scottish Government policy teams. This allowed us to pre-empt research needs as well as to proactively propose research where we saw an emerging need. We developed our ability to use CXC resources flexibly, in particular through iterating and regularly revisiting project plans for the MRP elements and Post Doctoral Fellowships, and by better targeting our deployment of the commissioning budget.

The Directorate has been able to meet less often as CXC's project management system and approach to working with stakeholders became well established. The Secretariat was more systematically involved in project planning and management – without 'getting in the way' – across CXC's portfolio of activities, including the MRP and Post Doc elements. The Project Manager and James Hutton CXC leads established a regular schedule of coordination meetings. All of this allowed the Secretariat to capture meta-data about CXC's projects and activities far more efficiently than previously. The Secretariat continued to gather feedback on projects from users, and maintained its key impacts metrics (KPIs).

The Directorate continued to play an important role in guiding CXC. The Directors met regularly, providing strategic direction and assisting in overcoming challenges.

CXC retained the cross-sectoral themes of adaptation and mitigation to structure our programme of research, and continued to foster broader collaboration across disciplines and institutions.

The balance of CXC's Post Doc resource shifted in 2014-15 with more of a focus on energy policy and energy system modelling. As well as bringing in new disciplinary expertise, this allowed CXC to engage better with a number of key policy users.

We made progress in 2014-15 in showcasing CXC as a model for KE on climate and energy in Scotland. Our newsletter and website readership improved and our events calendar was better coordinated. We continued to build connections with a growing community of researchers (including across the UK) that are in some way associated with CXC, extending CXC's reach and reputation as a pathway to impact.

There were a handful of large, complex projects in 2014-15 that required significant investment of Secretariat time. The outcomes from such projects are much more powerful than those from smaller projects or more ad hoc activities, but careful planning and ongoing management of resource inputs is needed.

4. OUTPUTS AND OUTCOMES

4.1 Supporting Policy and Practice

4.1.1 Stakeholder Engagement

Cross-Cutting

1. Committee on Climate Change meeting, Edinburgh

In January 2015 ClimateXChange, along with the Edinburgh Centre for Carbon Innovation, hosted the first meeting of the Committee on Climate Change (CCC) ever to be held outside of London. The CCC'S aim for this meeting was to gather evidence for the Committee's '[Reducing emissions in Scotland – 2015 progress report](#)', which was published in March 2015. It provided the opportunity for the Committee to hear about the progress that Scotland is making in transitioning to a low carbon economy directly from a full range of Scottish stakeholders including Government, NGO's, business organisations, environmental groups and academics. We were able to recommend to CCC experts across Scotland to provide further evidence for the progress report. This meeting allowed CXC to strengthen the close working relationship we have established with the CCC through our ongoing Adaptation Indicators project.

2. Presentations of the IPCC Fifth Assessment Report

The UN's Intergovernmental Panel on Climate Change released its [Fifth Assessment Report](#) in 2014. The report provides a detailed update on the state of scientific, technical and socio-economic knowledge on climate change, its causes, potential impacts and response strategies. The Scottish Government's Directorate for Environment and Climate Change approached CXC to present the key findings of the report and their relevance to Scotland. Policy Director, Andy Kerr, presented the report to senior officials represented on the Climate Change Delivery Board in June. In August, CXC Science Director, Professor Pete Smith, who was a lead author of the report, presented the findings to Scottish Government staff and stakeholders from SEPA, SNH, Sustainable Scotland Network, Adaptation Scotland and various environmental charities.

Energy

3. Energy systems modelling and analysis: Engagement with OCEA

In October 2014 CXC energy researchers met Scottish Government OCEA and energy policy staff to map CXC's research capability on energy systems modelling and analysis, and the Scottish Government's research needs. This gave OCEA a solid understanding of CXC's capability, enabling CXC and OCEA to agree a work plan for CXC's energy post doctoral fellows. Following this initial meeting, CXC fellows and their supervisors have regularly met with OCEA, including through an informal placement arrangement whereby CXC

researchers work alongside OCEA analysts, at Atlantic Quay. The ongoing engagement is highly valued by OCEA and energy policy staff.

4. Unconventional Gas Extraction in Scotland - An update for Policymakers, Planners and Regulators

This [event](#) was the result of collaboration between CXC researchers and SEPA in developing the [Life-cycle assessment of GHG emissions from unconventional gas extraction in Scotland](#). The project revealed the need to provide Scottish policymakers, regulators and planners with the opportunity to be updated on a number of recent research and policy developments relating to unconventional gas extraction in the Scotland. Over sixty participants including from Scottish Government, Local Government, industry, community groups and campaigners attended the event. Participants benefited from the presentation of CXC's report, as well as recent work undertaken by the British Geological Survey, DECC and the Scottish Government's Independent Expert Scientific Panel on Unconventional Oil and Gas. Delegates were provided with the opportunity to discuss their priority questions and concerns with a panel of leading experts in this field, including CXC researchers from the Universities of Aberdeen and Strathclyde.

5. Energy-economy-environment modelling: Engagement series

CXC economists and Scottish Government staff met regularly in a series of meetings organised through 2014. These meetings were coordinated upon request from the OCEA and the Renewables Policy Team, providing the opportunity for Scottish Government staff to gain a greater understanding of CXC's work to-date on multi-sectoral, energy-economy-environment modelling. CXC economists based at the University of Strathclyde provided staff with an overview of CXC's capacity to model the economic and environmental impacts of policy interventions related to resource productivity, renewable energy and carbon mitigation. CXC's work plan has been adapted to further align future research with Scottish Government priorities as a result of this engagement.

Engagement with the Scottish Government's Renewables Policy Team initiated a significant multi-institutional project for CXC, which will assess the [economic impact of local energy initiatives](#) supported through the Scottish Government's Local Energy Challenge Fund.

6. UK Energy Research Centre: Seminar Series

CXC has continued to build on our strong relationship with the UK Energy Research Centre this year. This relationship enabled us to co-host a series of seminars throughout 2014-15, bringing leading UK academics to present Scottish audiences with the latest research on energy technology, infrastructure and innovation. Seminars presented by [Professor Jim Skea CBE](#), [Jim Watson](#) and a number of other experts have been attended by a total of

more than 150 delegates, representing Scottish Government, regulators, local government, and industry bodies.

Adaptation

7. Adaptation Indicators: Series of engagement activities

Meetings and engagement events were held throughout the reporting period, with teams from across the Scottish Government and its agencies. The key engagement event was held in August 2014 at Victoria Quay and involved policy leads from all sectors. CXC researchers sought feedback on the adaptation indicators and followed the event with further bilateral meetings with key leads. In addition to this event, CXC Adaptation Indicators team members attended meetings of the Critical Infrastructure Resilience Unit (November 2014), the Scottish Utilities Contingency Planning Group (February 2015), and the Natural Environment Statistics Advisory Committee (March 2015) to present their work and solicit input to the further development of the indicators.

Wider engagement by the Adaptation Indicators team was ongoing throughout the reporting period with staff from: SEPA, Forestry Commission Scotland, Scottish Natural Heritage, the Scottish Government, Scottish Water, Ofgem, the energy utilities, National Grid, the Energy Networks Association, Transport Scotland, rail companies, NHS Scotland, the Regional Resilience Partnerships and several local authorities.

Forestry

8. Woodlands research: Engagement series

A series of meetings was held between research staff, the CXC Secretariat and staff from Forestry Commission Scotland (FCS) throughout 2014-15. These allowed CXC researchers from the James Hutton Institute, University of Aberdeen and Forest Research to present the findings of work to date and to discuss priorities for future research. Policymakers from FCS gained a greater understanding of CXC's capacity to model carbon stock changes resulting from various land use scenarios. The work plan for this research stream has been revised in response to feedback received during these meetings and will focus on assisting FCS in contributing to the third Report on Proposals and Policies (RPP3).

Natural Environment

9. Workshop on peatland priorities

This [workshop](#), held in October 2014, built on a previous event, and followed the publication of the 'Scotland's National Peatland Plan: Consultation Draft' by Scottish Natural Heritage in June. The event brought researchers together with policy specialists from Scottish Natural Heritage, SEPA, the Scottish Government, among others, and identified strategic priorities around

knowledge exchange and inter-disciplinary working. The workshop articulated a need to establish a cross-sectoral grouping to bring together peatland policy and research. Work to develop this group will be informed by the National Peatland Plan for Scotland.

4.1.2 Policy relevant outputs

Cross Cutting

1. [A 'green and fair' tax system in Scotland: Distributional impacts and impacts on rural poverty of a carbon tax in Scotland](#)

This [report](#) explores options for introducing a carbon tax on household energy use and private transport in Scotland, whilst protecting low income households from increased costs. The study illustrates how a green tax needs to interact with the wider benefit and tax system – particularly Universal and Pension Credit – to ensure that low-income households are protected and thereby balance environmental and social concerns. It was designed to consider how carbon pricing might be applied beyond the domestic electricity market in the context of the challenging climate change targets set by the Scottish Parliament in 2009. Delivered by the Centre for Sustainable Energy, the Institute for Fiscal Studies, the Policy Studies Institute and the Hutton. Customer: RESAS/OCEA. Contact: Daniel Hinze.

Energy

2. [Life-Cycle Greenhouse Gas Emissions from Unconventional Gas Extraction in Scotland](#)

This project [reviewed the potential GHG emissions](#) associated with extracting Scottish unconventional gas resources. CXC researchers from the Universities of Aberdeen and Strathclyde performed a desk-based life-cycle analysis of unconventional gas sources and identified where regulation could mitigate or reduce these emissions. This report was commissioned in response to a request from SEPA. Feedback from SEPA confirms that the report is assisting the Agency to respond to issues regarding the climate change impacts of unconventional gas in Scotland. In March 2015 the findings of this study were submitted as evidence to the Committee on Climate Change in response to the proposed amendments to the Infrastructure Bill. Results were also referenced in peer reviewed publications and policy briefs, including the [Royal Society of Edinburgh's](#) advice paper, [Options for Scotland's Gas Future](#). Customer: SEPA. Contact: Emma Taylor.

3. The economic scale of community and locally owned renewable energy in Scotland and projections to 2020

CXC continues to inform how the Scottish Government's targets for community renewable energy are delivered. During 2014-15 CXC economists from the University of Strathclyde assisted the Renewables Policy team to understand the local economic impacts of community energy by reviewing the current and projected [economic benefits of the expansion of community and local owned renewables](#) in Scotland. CXC examined the current level of community and locally owned renewable energy development in Scotland to project the economic benefit of expanding these types of renewable energy projects. The report was cited in the Scottish Government's [Community Energy Policy Statement](#). A supporting [policy briefing](#) reported the findings of a case study analysis of the economic impact of a proposed onshore wind development for the Shetland Islands. It studied economic impact for two ownership scenarios for the proposed project; a community benefit scheme scenario and a local ownership scenario. The report has contributed to the Renewables Policy Team's understanding of the relative economic impacts of community energy ownership and benefit sharing models. Customer: Renewables Policy Team. Contact: Sue Kearns.

4. Supporting community investment in commercial energy schemes

A study delivered by the University of Edinburgh, The Hutton and SRUC provided analysis of the factors that support and limit the ability of [communities to invest in commercial renewable energy schemes](#), based on international evidence. The evidence included a review of policy and previous community investment, surveys and focus groups of key stakeholders, and a review of case studies on community investment with international comparisons. The main conclusion from the report indicated that there is significant potential for increased community investment in commercial energy schemes. Customer: Onshore Renewables Team
Contact: Sue Kearns

5. Best practices in community engagement on wind farm developments

CXC was approached by the Scottish Government's Planning Division to undertake a review of [best practice for engaging with local communities](#) on wind farm developments. This study identified several important factors for community engagement, including wide-ranging and innovative methods of engaging and facilitating dialogue, and ways of measuring engagement through all stages of wind farm development. The study was directly referenced in the Scottish Government's [Consultation Draft](#) and final [Public Engagement for Sub-20MW Wind Turbine Proposals Good Practice Guidance](#) document. Delivered by the University of Edinburgh. Customer: Renewables Policy Team. Contact: Sue Kearns

6. Community benefits from offshore renewables: good practice review

[This report](#) explored the various methods that have been used in the UK and Europe to distribute the benefits from offshore energy developments. It was delivered to Local Energy Scotland and the Renewables Policy Team, to inform their ongoing development of advice for developers and communities. The report provided insights into how communities may best be identified, how impact is perceived and how benefits may best be apportioned. Its findings are supporting the Scottish Government's objective to better enable Scottish communities to share in the financial value of their local energy resources. Customer: Renewables Policy Team/Local Energy Scotland. Contact: Sue Kearns/Jennifer Ramsay.

7. Review of methodologies for assessing wind farms' impacts on tourism

[This study](#) was developed in response to a request from the Scottish Government to compare approaches used in a wide variety of studies that have considered the impact of onshore and offshore wind farm development on tourism. The report has enabled the Scottish Government to gain a better understanding of the various studies estimating the impact of wind farms on tourism, as it considers the delivery of its renewable energy and tourism priorities. Delivered by the Hutton. Customer: Tourism Team. Contact: Richard Walsh.

Adaptation

8. Scottish Native Woodland Adaptation – the potential use of a Flexible Adaptation Pathways (FAP) Framework

This report explores how the principles of the [Flexible Adaptation Pathways](#) approach could be applied to native woodland adaptation. It is the final output of a long-term project exploring what is known about the risks to native woodlands from climate change, their capacity to respond, and appropriate management responses. The report provides a comprehensive set of options for enhancing biodiversity and Scottish woodland adaptive capacity. It also considers the scope for providing greater support for woodland managers in relation to climate change. An [issues paper](#) was produced to further stimulate discussion on these issues, developing ideas that were first raised in a 2012 workshop. Delivered by Forest Research, the RBGE and the University of Dundee. Customer: SNH, FCS. Contact: Mary Christie (SNH) Gordon Patterson (FCS).

Forestry

9. Maps of above and below ground carbon stocks in Scotland

In November 2014, CXC researchers from Forest Research, the Hutton and the University of Aberdeen presented FCS with maps showing modelled above and below ground carbon stocks and total carbon stock changes out to 2050, under conversion of current land use to woodland. These maps are part of CXC's ongoing woodland research programme and will be further refined in collaboration with FCS, to assist them in developing future woodland planting strategies. The maps have enabled FCS to better understand the value and capacity of CXC's research to inform their decision making. Customer: FCS. Contact: Maida Ballarini.

Natural Environment

10. 2013 Supplement to the 2006 IPCC Guidelines for National Greenhouse Gas Inventories: Wetlands

[This report](#) examined the likely implications of changes in emissions calculations under UNFCCC reporting guidelines, following publication of the *2013 Supplement to the 2006 Guidelines: Wetlands* (The 2013 Wetland Supplement). It also considered the steps likely to be required for future inclusion of Wetland Drainage and Rewetting (WDR) as a reporting category in national accounting, as per the *2013 Revised Supplementary Methods and Good Practice Guidance Arising from the Kyoto Protocol* (the 2013 Kyoto Protocol Supplement). This follows the earlier publication in February 2014 of an initial report considering the use of the guidelines, then in draft, in GHG accounting of peatland restoration. Delivered by The Hutton and BioSS. Customer: RESAS. Contact: Liam Kelly.

11. Climate change risk-based assessment for notifiable features

ClimateXChange has been working with SNH since 2012 to develop an analytical procedure for prioritising climate change adaptation measures for Scotland's protected areas. This is a priority for SNH, and a goal within the Scottish Climate Change Adaptation Programme. The project has produced a ranked list of Notifiable Features in Scotland according to the risk posed to them by climate change, as well as analysis of potential adaptive management approaches for the most highly ranked features within that list. A summary report on this project was presented to SNH in December 2014, providing a summary of the analytical approach developed, the results of the analysis and possible adaptation management options. A full report was delivered directly to SNH. Delivered by the Hutton, RBGE, University of Aberdeen, University of Edinburgh, SNH and Dundee University. Customer: SNH. Contact: Mary Christie.

Agriculture

12. Review of the climate implications of land use change

In September 2014 the Scottish Government Land Use Strategy team commissioned CXC to undertake a review of the research evidence-base on land use options for climate change mitigation and adaptation. [This review](#) by the Hutton assisted Scottish decision makers to identify the best land use options in the second Land Use Strategy. Customer: Scottish Government Land Use Policy Team and RESAS. Contact: Linda Gateley, Daniel Hinze.

13. Agricultural emissions inventory – policy briefing

Research staff from SRUC met with Scottish Government Policy staff in August 2014 to provide a policy briefing on agricultural emissions. This included an update on the development of the agricultural emissions inventory, recent relevant research findings and a compilation of emissions projections. The audience included representatives from policy, statistics, economics and research staff covering the agriculture, climate change and environment topic areas. Customer: RESAS. Contact: John Landrock.

14. Risk mapping: estimating the risk posed by sheep pathogens (*Haemonchus contortus*) across the UK under the effects of climate change

As climate change makes Scottish summers warmer and wetter, livestock farmers will face new or increased threats from diseases and parasites. One such parasite is *Haemonchus contortus*, a blood-feeding worm which infects sheep and goats. This report looked at interim findings from a model that analyses the rate of parasite development under the likely mean daily temperature and precipitation, based on UK Met Office climate projections (UKCP09). The report contributes to CXC's ongoing work to enable the Scottish Government to better understand the potential impacts of climate change on Scottish agriculture. Delivered by the Moredun Research Institute and BioSS. Customer: Climate Change & Agriculture Policy. Contact: Antje Branding.

Transport

15. Electric vehicle spatial adoption profile for Scotland

This work looks at the constraints and opportunities around delivering sustainable transport in Scotland. The first output from this project was a policy briefing, profiling electric vehicle (EV) adoption levels across Scotland's Local Authorities and highlighting areas of relatively high and low adoption. This output will assist policymakers and researchers to evaluate the spatial variance in EV diffusion by identifying adoption front-runner areas. Delivered by University of Aberdeen. Customer: Transport Scotland. Contact: Zak Tuck.

4.1.3 Impact on policy

Cross Cutting

1. Climate Change Delivery Board membership

CXC's policy director continues to sit as a Non-Executive Member of the Scottish Government's Climate Change Delivery Board. During the 2014-15 period he informed the Board's understanding of the latest climate science, providing expert advice on the key findings of the IPCC 5th Assessment Report. He provided critical analysis and advice on key issues facing Scotland, including recovery from recently missed emissions targets. He also contributed to planning changes to the Board's operating model to enable it to become more effective in overseeing cross-cutting policy development. These changes have since come into effect during summer 2015.

Energy

2. Renewables Routemap : Equalities Monitoring Update 2014

CXC continues to contribute to the Scottish Government's [monitoring and evaluation of the 2020 Renewable Routemap for Scotland](#). We have developed an equalities monitoring programme, which is used by the Scottish Government in reporting the progress of the Routemap. A voluntary disclosure survey is used, and over time is intended to build up a picture of trends within the industry. As in previous years, Scottish Government will use the results of the 2014 survey to report equalities trends in the Scottish renewable energy industry for the 2014-15 period. The results of the 2014 survey will become available when the Routemap report is released in 2015. Customer: Onshore Renewables Team. Contact: Gordon Patterson.

3. Supporting Community Investment in Commercial Renewable Energy Schemes

CXC's report [Supporting community investment in commercial energy schemes](#), is informing the ongoing development of guidance and support materials for community groups and developers by Local Energy Scotland. Feedback from the Onshore Renewables Team states that a number of the report's findings will be taken forward by Local Energy Scotland. This includes developing further guidance and support materials aimed at both communities and developers, facilitating community investment, developing opportunities for sharing experiences, and building contacts through networking events. Customer: Onshore Renewables Team. Contact: Sue Kearns, Jennifer Ramsay.

4. Good practice guidance for public engagement for wind farm developments

Evidence from CXC's report on [Wind Farms Community Engagement Good Practice Review](#) stimulated further investigation by the Scottish Government

into best practices for community engagement. The lead author of the report was invited by the Scottish Government to sit on the working group to produce a consultation document, which was used in a six-week public engagement exercise. In November 2014 the Scottish Government released a [Consultation Draft](#) document, identifying good practice methods for stakeholders to engage better with communities and members of the public on wind turbine planning proposals. CXC's study was directly referenced in the Scottish Government's Consultation Draft and final [Public Engagement for Sub-20MW Wind Turbine Proposals Good Practice Guidance](#) document. Customer: Scottish Government Planning and Architecture Division. Contact: Simon Coote, Michael Westwater.

Adaptation Policy

5. Monitoring, evaluating and reporting adaptation progress

The CXC Adaptation Indicators team provided advice to the Scottish Government Climate Change Legislation team (as was) on monitoring and evaluation of the Scottish Climate Change Adaptation Programme for the annual reporting to Parliament. CXC produced a prototype template for recording progress against the SCCAP, which was directly used by the Scottish Government for collecting information to populate the SCCAP annual report. In addition, CXC provided case studies that were used in the annual report. CXC researchers and Secretariat also supported developing the template for mandatory reporting under the Climate Change (Scotland) Act 2009 Public Bodies Duties, with CXC providing the wording for several questions as well as a support function to the public bodies completing the template, through our Indicators project. Customer: Scottish Government Climate Change Legislation Team. Contact: Jo-Anne Lawson, Paul Fagan).

Agriculture

6. Scottish Rural Development Programme 2014-2020: spatial targeting for climate change

The current Rural Development Programme (SRDP) runs from 2014–20. The Scottish Government was committed to a simpler and more user-friendly design for the 2014-2020 Programme, including incorporating management information and monitoring. A key focus of this approach was to develop spatial targeting of SRDP options to ensure that funded activities achieved the highest impact. In 2013, The Scottish Government asked CXC to establish a climate change research group. The group, comprised of researchers from The Hutton and SRUC, produced a series of maps identifying the most significant climate implications. The research group provided advice to the Steering Group throughout 2014 as final targeting maps were agreed for the Programme. Customer: Natural Heritage Management Team. Contact: Susie Turpie.

7. Scottish Rural Development Programme 2014 - 2020– Beef Efficiency Scheme

The Scottish Government is developing a [Beef Efficiency Scheme](#) as part of the SRDP 2014-2020. This five-year scheme will provide support to beef breeders to improve efficiency, through genetic, economic and environmental improvements in the breeding and finishing sector. CXC researchers at SRUC have informed this scheme by providing evidence in response to direct requests from the Scottish Government's Livestock Policy Team. Customer: Scottish Government's Livestock Policy Team Contact: Frank Strang, Heather Curran, Martin Morgan.

8. Evidence to the Committee on Climate Change

On 23 January 2014 academics from SRUC presented evidence to the Committee on Climate Change's [review of the Scottish Government's progress](#) towards meeting its climate change targets in the agriculture and land use sector. The Committee's report was published in March 2015. Customer: The UK Committee on Climate Change. Contact: Ute Collier.

Natural Environment

9. Scotland's National Peatland Plan

CXC brought together key stakeholders from policy, research and practice groups at a workshop in October 2014. The aim was to draw out key research priorities that will help to secure the long term future for Scotland's peatlands. Three strategic priorities were agreed which address core knowledge, long term monitoring and the interrelationship between social and scientific factors. The results of this event are directly referenced in the [published plan](#) (p.33). Customer: SNH, Scottish Government Environmental Quality team. Contact: Neil Ritchie

4.1.4 Benefits to other stakeholders

General

1. Communicating best practice

The CXC Secretariat worked to share best practice on how science can inform policy making. This was done through:

- Contributing to the Scottish Crucible leadership and development programme for early career researchers, which aims to give a greater understanding of how science can benefit society.
- Presenting lectures to MSc students studying science, environment and society
- Hosting a Policy Officer from the Scottish Government Renewable Policy team on short secondment to gain insight into the work of CXC as a centre of expertise.
- Promoting Scotland's CoEs as exemplar models of science-policy knowledge exchange.

2. Zero Waste Scotland data strategy for material flows: workshop

CXC was approached by Zero Waste Scotland (ZWS) and SEPA in May 2014 to assist in developing a long term data strategy to measure material flows. ZWS identified collecting such data as essential for enabling and measuring Scotland's progress towards a circular economy. CXC assisted ZWS in preparing and co-facilitating a stakeholder workshop, which brought together academic and technical experts. The workshop investigated data options, balancing knowledge requirements, timescales, resources and risks. Recommendations captured during the workshop fed in to an options paper, which was presented to the ZWS Senior Management Team

Adaptation

3. The UK Climate Change Risk Assessment

CXC researchers and the CXC Project Manager were involved in supporting the 2nd UK Climate Change Risk Assessment. Working with the ASC Secretariat, sector representatives in Scotland, Adaptation Scotland, UKCIP, LWEC partners and the wider UK research community, CXC was part of the planning process for the CCRA and played a pivotal role in framing the CCRA summary for Scotland that will be published in 2016. CXC continues to be influential in the CCRA process, providing a voice for, and representing the interests of, the wider Scottish stakeholder community in the CCRA development process.

Forestry

4. Climate change adaptation in the forestry sector

CXC researchers based at Forest Research have produced a series of videos and tutorials to support forest managers. The tutorials and videos use existing decision support tools to aid in selecting suitable species for forests under future climate conditions. Three videos and three tutorials were completed this year and are [available online](#). These resources are being promoted to the private sector, along with increasing awareness of risks and adaptation actions. CXC researchers are also developing case studies at the QEPF Climate Ready Demonstration Forest to support the forest sector adapt to climate change. This work supports FCS and other stakeholders in the forestry sector to make policy and land use decisions by integrating adaptation into forest planning and management, and embedding practitioner experience with research.

4.2 Collaboration and Multidisciplinary Working

4.2.1 Collaborations

Cross Cutting

1. Behaviours Research

CXC's Behaviours research team, based at the Hutton, is studying behavioural changes required across all sectors of Scottish society for the transition to a low carbon economy. The research covers transport and energy behaviour, energy extraction practices, land management and climate change adaptation. A multidisciplinary team has been established to undertake this work, including multiple social science (i.e. psychology, planning, and sociology) and biophysical disciplines (i.e. ecology and natural resource management). The team is also collaborating with a CXC PDRF based at the University of Aberdeen to research transport behaviour change. In 2014 the team produced [Narratives of a low carbon life in Scotland in 2030](#), which were used by the Scottish Government's Scotland 2030 project. The project provides a view of what Scottish life may [look and feel like in a low carbon future](#).

2. IMPRESSIONS Project

A CXC researcher at the RBGE continues to participate in the [IMPRESSIONS Project](#), a major EU-funded project aimed at increasing understanding of the consequences of high-end climate change, which includes Scotland as a case study. IMPRESSIONS will build upon the scenarios developed by the CLIMSAVE project, but focus on decision-makers strategies for dealing with the impacts of high-end (>2°C) climate change in Scotland.

3. Adaptation Indicators

The ongoing engagement and collaboration with stakeholders facilitated through our Adaptation Indicators has enabled CXC to identify further opportunities for research. Two additional projects were initiated during the reporting period as a result. The first is using SEPA flood risk data to assess the [rate of development in flood risk areas](#) from 2004-2014. The second project will assess the effectiveness of Scotland's land-use policies in preventing [development in flood prone areas](#). This project is being overseen by a steering group consisting of representative from SEPA, the ASC and CREW.

Land Use

4. Land use workshop

In January 2015, CXC hosted a [workshop session](#) focusing on land use; bringing researchers together with the policy leads from across the CAMERAS network. The event informed ClimateXChange priorities for 2015/16 and generated constructive discussion on the draft CAMERAS evidence plan for integrated land use management and planning. It also identified emerging synergies and the potential for cross-cutting projects that address multiple land use policy objectives.

Agriculture

5. Mainstreaming climate change into rural development policy post 2013

[This report](#) was produced by SRUC to inform the European Commissions' Directorates General for [Climate Action](#) and [Agriculture](#) about the Rural Development Programme (RDP) policy implementation potential mitigation and adaptation options. The project is designed to inform ongoing mainstreaming of climate change in the RDP as it evolves over the 2014-2020 budget period (e.g. through health checks). The authors of the report also co-organised a workshop for national RDP programming officers and other RDP stakeholders in Brussels in June 2014. The aims of the workshop were to enable attendees to provide feedback on the RDP guidance developed during the project, and to raise their awareness about the scope for integrating climate change measures in their RDPs.

Energy

6. UKERC Low Carbon Jobs research project

A CXC researcher based at the University of Strathclyde was a member of Project Expert Group for UKERC's project on [Low carbon jobs: The evidence for net job creation from policy support for energy efficiency and renewable energy](#). The Expert Group included members from the University of Surrey, the Carbon Trust, European Investment Bank and an independent consultant. The report was published November 2014.

7. Carbon Calculator Project

Since 2011 applications for developing wind farms with a capacity of 50MW or greater on peatland sites have been expected to use the Scottish Government's Peatland Carbon Calculator (the C calculator) as part of their environmental impact assessment. This tool provides a life cycle assessment of the GHG emissions and carbon payback from wind farm developments. This project brought together research specialists from the Universities of Glasgow and Aberdeen, and the Hutton, with policy officials from national government and the environmental agencies.

CXC played a primary role in strengthening relationships through the lifetime of this project, drawing in several disciplines to gain a holistic understanding of the potential role of the tool, and working closely across Scottish Government, agencies and local government on how it could be applied.

Adaptation

8. Collection of Adaptation Case Studies showcased via the weADAPT website

In collaboration with a range of practitioners, Heriot-Watt has collected and documented 16 case studies of adaptation in action. These have been accepted by weADAPT to form part of their global adaptation case study collection. The case studies are viewable online at the [weADAPT website](#). The project was completed in June 2014 and involved collaboration with Forest Research, RBGE, RSPB and Tweed Forum.

9. Cost-Benefit Analysis of a local authority climate change risk register (Aberdeenshire)

CXC has been working closely with Aberdeenshire Council and Scottish Water to develop a pilot project that will examine [the costs and benefits of managing the risks arising from climate change](#). Time was invested in securing a detailed specification, involving colleagues from Aberdeenshire Council, SEPA and Scottish Water. This was an exceptionally valuable process, with participants gaining insight into adaptation principles and increasing their understanding of their complementary perspectives. Project leads have also worked closely with Adaptation Scotland, who recognise the value of such a case study to other local authorities and have provided input into the project. This project is led by researchers from Scotland's Rural College (SRUC) and will report in spring 2016.

Forestry

10. Woodlands Research

CXC is building a strong collaboration for integrating complex datasets that can improve our understanding of carbon sequestration in a Scottish context and inform the development of forestry policy. The Forestry Commission Scotland (as policy lead) is coordinating the work with Forest Research, University of Aberdeen and the Hutton. The results will inform the preparations for RPP 3. The overall project is multidisciplinary, involving plant physiologists, economists, geographers, foresters, soil scientists, GHG specialists, hydrologists, and ecologists. The project builds on existing work in the RESAS Strategic Research Programme (SRP), specifically the work on soil carbon and woodland expansion for multiple benefits.

5. PROGRESS REPORTS ON ACTIVITIES

5.1 Energy

Energy remains a central focus of CXC's ongoing and commissioned work. We responded to demand for energy research from policy teams in 2014-15 by taking on four new post-doc positions focussed on energy policy and energy system modelling. We have also continued to respond to energy policy research needs through a significant number of commissioned projects. Energy research during this period has had a range of policy team customers including Renewables policy, OCEA, Tourism, Energy Efficiency and Low Carbon Economy Unit and SEPA.

Deliverable 1. Renewables (Sept 2014 rating: GREEN; April 2015 rating: GREEN)

- [Community Benefits from Offshore Renewables](#) (January 2015)
- [Supporting Community Investment in Renewables](#) (December 2014)
- [Wind Farms Community Engagement Good Practice Review](#) (August 2014)
- [Citizens' Juries research project - onshore renewables](#) (delivered May 2015)
- [Wind Farm Impacts Study](#) (delivered June 2015)
- [Lifecycle emissions & costs from onshore and offshore wind](#) (delivered June 2015)
- [Comparative costs of community and commercial renewable energy projects in Scotland](#) (delivered July 2015)
- Impacts of onshore wind farms on property values (delayed due to extension of research scope, due date to be revised)

Deliverable 2. Planning and Regulation (rating: GREEN)

- [Understanding the Potential Climate Impact of Unconventional Gas Extraction in Scotland](#) (delivered May 2014)
- [Review of methodologies for assessing wind farms' impacts on tourism](#) (March 2015)

5.2 Forestry

5.2.1 Woodland expansion

CXC's woodlands expansion work aims to identify the GHG benefits of converting to different types of woodland, and assess the impact of woodland expansion on agricultural production, rural livelihoods, and other ecosystem services. The work is led by a collaboration of researchers from the Hutton, the University of Aberdeen and Forest Research. The research team and the CXC Secretariat have worked closely with Forestry Commission Scotland (FCS) throughout 2014/15 to identify priority outputs from this work. One deliverable from previous years (Deliverable 2) has been terminated, and the remaining deliverables refined to suit policy needs.

Deliverable 1. Modelling of C stock changes following conversion into woodland (Sept 2014 rating: GREEN; April 2015 rating: GREEN)

- Maps of current land use, soil carbon changes over time and yield of four forest management alternatives (FMAs) have been produced and combined.
- The resulting maps were analysed for distribution of C stock changes when land use units were repeatedly sampled to make up the 100,000 ha woodland SG targets by 2022.
- These maps and subsequent analysis were presented to FCS for discussion for further refinement of the workplan.

Deliverable 2. Economic analysis of woodland planting by land managers (Sept 2014 rating: NA; April 2015 rating: NA)

- This deliverable was terminated due to a shift in policy demand, following discussions with FCS.

Deliverable 3. Scenarios of future land use change and climate change (Sept 2014 rating: GREEN; April 2015 rating: GREEN)

- Three scenarios of woodland planting have been identified for modelling through consultation with FCS throughout 2014/15, these are:
 1. Baseline: The UK GHG inventory assumptions and net sequestration figures used as the basis for predicting the contribution trees and woods make to emissions reduction relate to the existing forest area. (Baseline scenario)
 2. Scenario 1: To evaluate the impact on net carbon sequestration assuming a new planting programme that is based upon the current policy target of +10,000 hectares per year.
 3. Scenario 2: As Scenario 1, but the analysis restricted to WEAG Phase 3 land.

Deliverable 4. Quantifying woodland loss from planning consents: (Sept 2014 rating: Green or GREEN; April 2015 rating: GREEN)

- Rates of afforestation/deforestation/non-change for the whole of Scotland have been mapped and calculated using publicly available National Forest Inventory (NFI) (2011-2013) datasets.

5.2.2 Forest adaptation

The forest adaptation project is communicating key learning on adaptation to the sector, including forest managers and policy leads. The work is led by Forest Research.

Deliverable 1. Climate change adaptation indicators for the Forest Sector (Sept 2014 rating: GREEN; April 2015 rating: GREEN)

- Six adaptation indicator templates have been completed for the forest sector. These templates will contribute to the suite of adaptation indicators that CXC is developing for the ASC. The templates have been completed in consultation with FCS.

Deliverable 3. Measuring Species Diversity & Resilience on the National Forest Estate (Sept 2014 rating: GREEN; April 2015 rating: AMBER)

- A method has been developed to measure the diversity of forest tree species on the National Forest Estate. This will assist policy makers to monitor the resilience of the Estate. The research has been slightly delayed due to staffing issues but will be delivered later in 2015.

Deliverable 3. Ecosystem Service Delivery under Adaptation Management Scenarios (Sept 2014 rating: GREEN; April 2015 rating: AMBER)

- A case study report modelling the impacts of climate change and forest management decisions on ecosystem service delivery at Queen Elizabeth Forest Park has been drafted. The research has been slightly delayed due to staffing issues but will be delivered later in 2015.

Deliverable 4. Knowledge Exchange: Forest Tree Species Selection Videos & Tutorials (Sept 2014 rating: GREEN; April 2015 rating: GREEN)

- A [series of videos and tutorials](#) has been produced to support forest managers select species suitable for their forests under future climate conditions using existing decision support tools. These support FCS policy advisors to meet deliverables N3-4 & N3-7 of the Scottish Adaptation Programme.

5.3 Natural Environment

5.3.1 Peatlands

The peatlands project aims to deliver practical tools to support achieving Scotland's emissions reduction targets and the aims of the 2020 Biodiversity Challenge. These include a decision support tool (WISE Peatland Choices), which is a spatial assessment of the likelihood that a given area in Scotland could be suitable for peatland restoration, calculations of the likely emissions abatement that can be achieved through peatland restoration, and the economic cost and benefits of restoration activities.

Deliverable 1. WISE Peatland Decisions Tool (Sept 2014 rating: GREEN; April 2015 rating: GREEN)

- The tool has been further developed, including the addition of data layers and improved uncertainty, site condition and peatland connectivity estimates.
- Attempts to include remotely sensed burning are in progress and plans are in hand to investigate climate sensitivity

Deliverable 2. Analysis of the public payments for peatland restoration (Sept 2014 rating: GREEN; April 2015 rating: GREEN)

- Payments for peatland restoration in previous SRDP programmes have been assessed by overlays of the relevant payments made under the Land Managers Options onto the peat soils maps. The aim is to provide information on the likely carbon savings provided by these measures. The work is ongoing.

5.3.2 Biodiversity – Assessing climate risk to Notifiable Features

ClimateXChange has been working with SNH since 2012 to develop an analytical procedure for prioritising climate change adaptation measures for Scotland's protected areas. This is a priority for SNH, and a goal within the Scottish Climate Change Adaptation Programme. The project has taken the list of Notifiable Features in Scotland and ranked it according to the risk posed to these Notifiable Features by climate change. An analysis of potential adaptive management actions has been undertaken for the most highly ranked features within that list. This collaborative project is delivered by the Hutton, RBGE, University of Aberdeen, University of Edinburgh, SNH and Dundee University. Customer: SNH

Deliverable 1. Climate Change Risk-Based Assessment for Notifiable Features in Scotland – Phase 2 Report (Sept 2014 rating: GREEN; April 2015 rating: GREEN)

- A report on work during phase 2, including the analytical approaches adopted and the results of the analyses was delivered to SNH (December 2014).

Deliverable 2. Summary Report: Climate Change Risk-Based Assessment for Notifiable Features in Scotland (Sept 2014 rating: GREEN; April 2015 rating: GREEN)

- A [summary report](#) on this project was presented to SNH in December 2014 as a policy brief on the analytical approach developed, the results of the analysis and possible adaptation management options.

5.4 Agriculture

The aims of CXC's agriculture work are to improve understanding of the potential impacts on agricultural production and food security of climate change, and to increase knowledge of the mitigation potential in the agricultural sector. We have been able to accelerate this work by adding specialist staff resource in crop modelling.

Deliverable 1. Spatial targeting of Scottish Rural Development Programme agri-environment-climate options (Sept 2014 rating: GREEN; April 2015 rating: AMBER)

- Series of maps produced to identify priority areas for climate-related options under the 2014-2020 SRDP. Advice provided to project Steering Committee (July 2014).

Deliverable 2. Food Security (Sept 2014 rating: GREEN; April 2015 rating: AMBER)

- Initial yield and efficiency modelling (cereal crops) modelling results have been produced for soil-weather-management combinations for

all fields growing barley in Scotland. This serves as the key starting point for further model evaluation (selected site specific comparisons) and experimental design. The work has built on the modelling and data capacity developed within RESAS Theme 4 – Economic Adaptation WP4.2.

Deliverable 3. Crops and Livestock (Sept 2014 rating: GREEN; April 2015 rating: GREEN)

- [A report](#) on the risk posed by sheep pathogens (*Haemonchus Contortus*) across the UK under the effects of climate change has been produced and published on the CXC website (completed August 2014). This report is based on research undertaken by the Moredun Research Institute during the 2013-14 funding period.

5.5 Built Environment

We have continued to focus our built environment research on developing adaptation indicators to inform the ASC's review of Scotland's progress on adapting to climate change (see 'Cross-Cutting Activities' below). We have also initiated a number of built environment research projects through our commissioning budget during the 2014-15 period, in response to requests from Scottish Government policymakers.

Deliverable 1. Commissioned Projects (Sept 2014 rating: GREEN; April 2015 rating: AMBER)

- A Comparative Review of Housing Energy Efficiency Interventions (due September 2015)
- Literature review on energy storage (delayed from original deadline due to additional requests from the policy customer, but submitted August 2015)

5.6 Economy

CXC's economy work supports understanding of the macro economic effects of current and potential low carbon policy changes in Scotland. The commissioning budget has been used to respond to requests from policy teams for discrete research into energy productivity and strategies for strengthening the low carbon economy in Scotland. A series of consultation sessions between CXC economists and Scottish Government staff has improved understanding of CXC's economic modelling abilities. It has also resulted in the initiation of a collaborative project between the Fraser of Allander Institute and the Hutton, to monitor the economic impact of projects funded through the Local Energy Challenge Fund.

Deliverable 1. Commissioned Projects (Sept 2014 rating: GREEN; April 2015 rating: GREEN)

- Energy productivity – report on Scottish and international case studies (On track, due September 2015; scope extended late 2014)
- Boosting Innovation and Skills for the Low Carbon Blue Economy in Scotland (on track, due November 2015)
- A 'green and fair' tax system in Scotland: Distributional impacts on rural poverty of a carbon tax in Scotland (November 2014)

Deliverable 2. Energy-environment-economy modelling (Sept 2013 rating: GREEN; April 2014 rating: GREEN)

- Economic impact of local energy economies – assessment of the economic impact of projects funded through the Local Energy Challenge Fund (on track, commenced March 2015, due in 2016)
- Understanding the economic impact of increased household energy efficiency and distributional analysis through disaggregation of household types (on track, due 2015/16)
- Understanding employment in low carbon and renewable activities in Scotland (on track, due 2015/16)
- Report: The economic scale of community and locally owned renewable energy in Scotland and projections to 2020 (July 2014)
- Report: The local economic impact of renewable energy projects: a Shetland case study (November 2014)

5.7 Cross-Cutting Activities

5.7.1 Behaviours

A multi-disciplinary research team has been established at the Hutton to research behavioural changes required to transition to a low carbon economy. The research covers transport and energy behaviour, energy extraction practices, land management and climate change adaptation. This cross-cutting research will inform various Scottish Government policies requiring behavioural change.

Deliverable 1. Transport Behaviour (Sept 2014 rating: GREEN; April 2015 rating: GREEN)

- Collaboration developed with University of Aberdeen's CXC PDRF and Professor Jillian Anable, work to commence financial year 2015-16.

- Study on rural car sharing planned and report structure determined (commenced February 2015, due 2016)

Deliverable 2. Visualisation techniques (Sept 2014 rating: GREEN; April 2015 rating: GREEN)

- Land management practices- Relevant literature reviewed, technical report in draft, due end-2015
- Low Carbon Scotland Vision evidence based narrative document published

Deliverable 3. Workplace Energy Behaviour (Sept 2014 rating: GREEN; April 2015 rating: GREEN)

- Policy brief from journal manuscript under development, due 2016

Deliverable 4. Adaptation and Transitions (Sept 2014 rating: GREEN; April 2015 rating: GREEN)

- Sustainable adaptation – manuscript under development, due 2016
- Community transitions – topic refined, re-analysis of existing data conducted, draft concept note submitted to CXC, research note drafted, due 2016

5.7.2 Adaptation Indicators

CXC's Adaptation Indicators Project supports monitoring and reporting of adaptation progress in Scotland, and in particular is informing the independent assessment of the Scottish Climate Change Adaptation Programme (SCCAP) being undertaken by the ASC.

The project developed a complete indicators suite for all three themes of the SCCAP in 2014/15, engaging regularly with stakeholders, data holders and users and sharing draft indicators with these groups to ensure rigour and buy-in.

Deliverable 1. Adaptation Indicator suite for Scotland (Sept 2014 rating: GREEN; April 2015 rating: GREEN)

- The Indicators team published three completed indicators on the [CXC website](#) and worked up over 60 other indicator documents in collaboration with wider stakeholders and data owners. These indicators were collated ready for presentation to the Adaptation Sub Committee (in June 2015). They are on track to be finalised and uploaded to the CXC website in late 2015.

List of acronyms

ASC – Committee on Climate Change Adaptation Sub Committee
CCC – Committee on Climate Change
CoE – Centre of Expertise
CXC – ClimateXChange
DECC – Department of Energy and Climate Change
DEFRA – Department for Environment, Food and Rural Affairs
EA – Environment Agency
ESRC – Economic and Social Research Council
EV – Electric vehicle
FCS – Forestry Commission Scotland
FSA – Financial Services Agency
IPCC – Intergovernmental Panel on Climate Change
KE – Knowledge Exchange
KPI – Key Impacts Metrics
NCR –
NGO – Non-governmental Organisation
NERC – Natural Environment Research Council
OCEA – the Office of the Chief Economic Advisor
OECD – Organisation for Economic Co-operation and Development
QEFP – Queen Elizabeth Forest Park
RESAS – The Scottish Government's Rural and Environment Sciences Analytical Services
SCCAP – Scottish Climate Change Adaptation Programme
SEPA – Scottish Environment Protection Agency
SNH – Scottish Natural Heritage
SRDP – Scottish Rural Development Programme
SRUC – Scotland's Rural College
The Hutton – James Hutton Institute
UKERC – UK Energy Research Centre
UNFCCC – United Nations Framework Convention on Climate Change
WDR – Wetland Drainage and Rewetting
ZWS – Zero Waste Scotland