



# The ClimateXChange Centre of Expertise

**A knowledge exchange model for  
research, policy and practice**

# Welcome

## Our member institutions



ClimateXChange came about from what seemed like a cultural gulf between research and policy, reflecting a lack of trust between the two communities. The Centre grew from the Scottish Government's clearly specified need to make better use of publicly funded research in policy development, and from a frustration at the silos within which policy development and research operated. Researchers and policy teams were too often talking at cross-purposes. Researchers appeared more interested in their own research focus, rather than answering questions posed by policy teams in a timely manner. Conversely, policy teams often posed questions that were not amenable to a bounded piece of analysis by researchers.

So we designed ClimateXChange to build an effective, trusting relationship between policy teams and the research community, brokered by the core ClimateXChange team of Directors and Secretariat. It has been trial and error – some civil servants and researchers “get it”, others don't. We have had a relentless focus on delivering a research and analysis service that meets the needs of the end user – the policy teams and public agencies – to demonstrate the value of embedding academic analysis in their work, and on building a network of researchers willing and interested in engaging with policy. We have won trust through diligent work with both researchers and policy teams, and so have been able to create a proper co-production model of knowledge, where the insights from policy teams and researchers contribute to better government policy development and implementation.

There is a great deal of hard work and “learning by doing” behind the lessons in this report. It is a testament to both communities of willing researchers and engaged policymakers. At the heart of ClimateXChange is the Secretariat team, actively “brokering” knowledge between the respective communities, involving synthesis, translation, packaging and communicating research insights to help government policy making. I hope this document will give a sense of how we do this work in ClimateXChange, and be an inspiration for those who have similar ambitions.

**Andy Kerr**  
on behalf of the ClimateXChange Directors

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## 01 Introduction

ClimateXChange (CXC) is Scotland's centre of expertise on climate change. We provide independent advice, research and analysis to support the Scottish Government as it develops and implements policies on adapting to the changing climate and the transition to a low carbon society.

The primary aims of CXC are to:

- deliver timely and high quality advice to the Scottish Government, specifically to the main policy divisions and to implementation partners;
- coordinate research, analysis and interpretation across the subject area, leading to more activity and high quality world leading research in the subject;
- stimulate innovative thinking in support of policy development and implementation; and
- develop a programme of knowledge exchange in order to ensure effective underpinning of policy as well as the wider dissemination of knowledge.

Researchers in 14 of Scotland's leading research and higher education institutions are members of ClimateXChange. Strategic direction is provided by the three Directors – for science, policy and relations with the Main Research Providers. Projects are managed by a central secretariat with policy, project management and communications expertise.

From our start in 2011 the Centre has engaged with a growing number of stakeholders and Scottish Government policy teams as our portfolio of projects has matured. We can see tangible evidence of the value of our work in published policy documents and current policy debate.

***Knowledge exchange is a two-way process where scientists and individuals or organisations share learning, ideas and experiences.***

Economic and Social Research Council

CXC has built a genuinely collaborative approach to project scoping and co-production of knowledge. Close working relationships with a range of Scottish Government policy teams allow us to pre-empt research needs as well as to proactively propose research and engagement work where we see an emerging need.

There has been substantial interest in the model and how it has evolved. The current model – based on our learning from engaging with the policy and research community – differs from the structure set up in 2011. We have made these changes as a result of continuous dialogue between CXC Directors and Secretariat, and our main contacts in the Scottish Government, its agencies and across the research providers.

**This report outlines our learning and draws in samples of our work to illustrate the key processes to successful knowledge exchange between research and policy.**

**As demand for evidence based policy increases, we believe these lessons can be used by those who have similar aims to CXC, and inform funding decisions and design of knowledge exchange beyond Scotland and for any policy area.**



*ClimateXChange exemplifies the partnership approach. It builds on the strengths of each of its partners, ensuring that our response to climate change is based on the best possible scientific evidence.*



Paul Wheelhouse MSP  
Then Minister for Environment and Climate Change, Keynote Address to the Adaptation Scotland Conference, September 2013



## 02 Rationale

As a devolved administration, Scotland is able to make decisions on matters related to agriculture, forestry and fisheries, the built environment, tourism and many aspects of transport and energy.

With these powers, the Scottish Government passed the ambitious Climate Change (Scotland) Act 2009 with cross-party agreement. This pushed the issue of climate change to the forefront of Scotland's policy agenda, establishing Scotland's commitment to drastic greenhouse gas emissions reduction targets and associated policy planning and reporting.

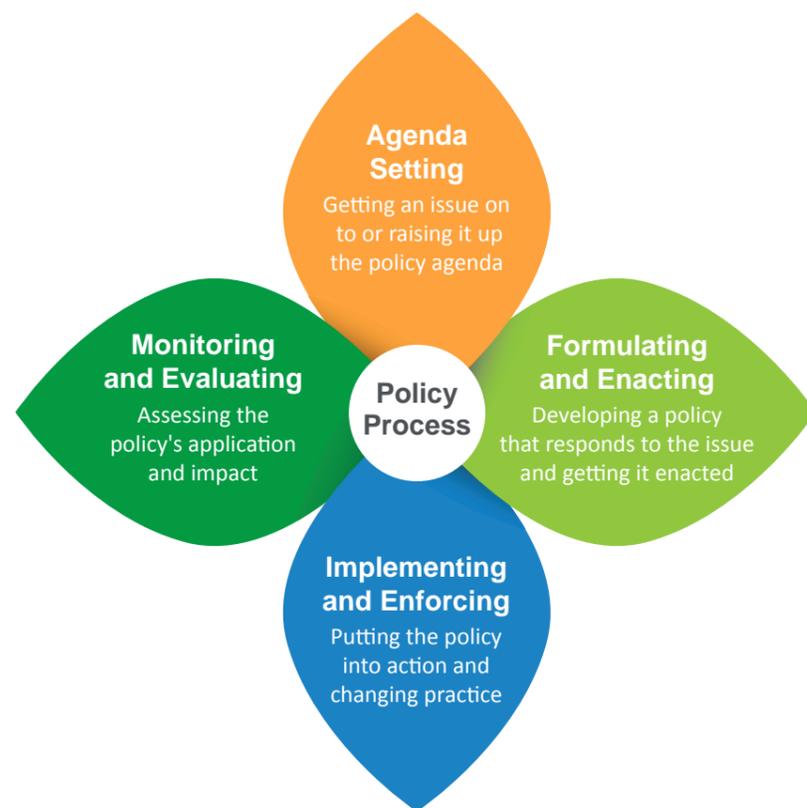
Scottish Ministers' focus on the transition to a low carbon economy needed support from a research agenda that could make informed recommendations for action. At the time, the significant Scottish Government funding for scientific research was not being utilised by its policy teams. In part this was due to the nature of the research commissioned, which included a significant proportion of strategic research funding to Scotland's 'Main Research Providers' (MRPs<sup>1</sup>) spanning longer time frames than useful for answering shorter term policy questions. However, another difficulty was the inaccessible nature of the reports and academic papers produced by the wider academic community. These papers were not written with a policy maker's questions in mind, nor were policy-critical points drawn out.



<sup>1</sup> The Scottish Government funds a wide range of agricultural, biological and environmental research which aims to build knowledge that strengthens policy and contributes to the delivery of national outcomes. This 'Strategic Research Programme' amounts to approximately £50 million each year and is managed on behalf of the Scottish Government by its Rural and Environment Science and Analytical Services Division (RESAS). Around 85% of this research is conducted through the Scottish Government's Main Research Providers (MRPs) - [www.scotland.gov.uk/Topics/Research/About/EBAR/research-providers](http://www.scotland.gov.uk/Topics/Research/About/EBAR/research-providers)

A core task for CXC was to create a two-way understanding of the science needs of policy and the capabilities of research to meet those needs. This would create a more targeted research programme on climate change and energy; in particular a body of work which was better focussed upon critical policy questions and which was better aligned with the relatively short timescales of policy decision making.

**Figure 1. Policy cycle**



ClimateXChange was set up to provide research input at all stages of the policy cycle, working with the policy teams from horizon-scanning, agenda setting and assessing how research can best inform decisions, to evaluating the outcomes.

## 03 Structure

ClimateXChange acts both as a knowledge broker between researchers and policy, and as a research provider.

We seek to deliver the best ideas, knowledge and evidence to policy teams, and to deliver effective pathways to impact for Scottish researchers.

Today we have **two ways of working**:

### 1. A co-produced multi-disciplinary research programme

We work in partnership with the Scottish Government and its agencies to respond to questions and requests for evidence, identify upcoming evidence needs, and then independently plan our research and analysis to meet policy timelines. It is a flexible research programme, co-developed with policy colleagues to deliver research syntheses, desk-reviews, in-depth studies, reports and other outputs.

### 2. Knowledge brokering

We facilitate conversations and broker knowledge across sectors, disciplines and institutions to provide new insights for policy. This is done through a variety of forms, from workshops and seminars to introducing new tools and techniques on topics including priorities for peatland research and community energy development. Knowledge exchange builds relationships and networks, and gives policy access to a research network far beyond CXC.

This model of work represents a significant progression from the original structure of three workstreams – ‘adaptation’, ‘mitigation’ and ‘risk and uncertainty’ – with multiple-workstrands within each of the three. This original model lacked policy impact overall as the workplans were generated by the researchers themselves without real engagement with the policy customer.

Experience through the first five years has highlighted the challenge of communication and understanding between policy, with its focus on delivering tangible change through policy decisions, and researchers, whose purpose is to provide robust and defensible knowledge and understanding. ClimateXChange’s challenge has been to develop a model where researchers are made responsible for presenting their knowledge in ‘policy language and format’, with extensive support from the CXC Secretariat, while retaining their scientific integrity.

# 04 Case studies

The Secretariat actively manages all CXC projects, supporting our researchers at every step of the process. The specific steps of each project are defined by the issue, the number of stakeholders to be involved, the complexity and degree of multi-disciplinarity of the research, and the timelines. Figure 2 shows the elements our projects contain and who is involved in the process.

Knowledge exchange is not a linear process, moving seamlessly from research to synthesis, translation, packaging and delivery. On the contrary, our most successful projects show that flexibility in the on-going engagement between policy and research teams is key, iterating towards an output that delivers both parties' objectives.



*The CXC Secretariat manages projects professionally, is focussed on providing an excellent service to policy customers, has the expertise to judge the priority of policy requests and to specify tightly the required research.*



RESAS feedback on 2013-14 Annual Report



All the projects we have delivered since 2011 have been part of shaping the Centre. Here we draw on some case studies to illustrate our learning.

## Wind Farm Impacts Study

This project aimed to help policy makers understand how well the planning system is assessing the impacts of wind farms on local residents, in advance of the schemes being constructed, and whether local residents are sufficiently protected through the planning system. We examined ten legacy case study examples to understand whether there were lessons that could be drawn to inform current practice.

### Success factors

From the start this project was designed with a stakeholder steering group which included both proponents and opponents of wind farms, to ensure the potentially contested results would be widely accepted. As a result of tight project management and the stakeholder scrutiny throughout the process, the robust report contained a series of well evidenced and forward looking recommendations. Stakeholders remain engaged and are taking forward discussions on how the recommendations can be addressed.

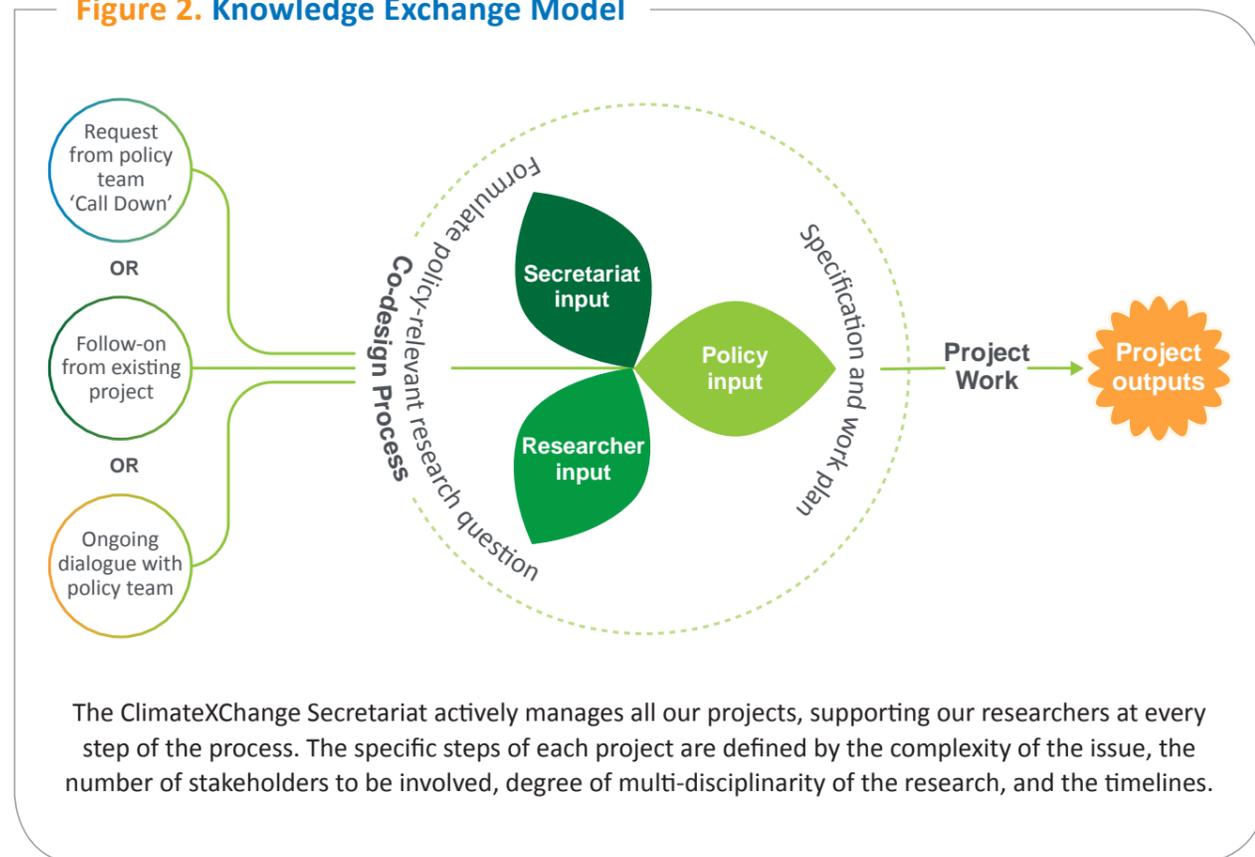
### What the case study says about how we do what we do

#### Creating spaces for deliberation

Collaborative dialogue allows for joint construction of policy priorities, identifying knowledge gaps and research questions, and in turn, creating research which is informed by an understanding of what is feasible from a scientific perspective and what is useful to enrich decision-making. The experience of CXC is that this dialogue has enabled us not only to build understanding between scientists and policy teams but also within the scientific and policy communities, breaking down boundaries between scientific disciplines and research organisations, and between policy teams and policy-making organisations. We have also found early engagement between policy and science teams to be important, enabling projects to be shaped by the expertise of policy makers as well as scientists - for example via the re-framing of research questions or their context.

This **Wind Farm Impacts Study** entered the policy process following anecdotal evidence that the noise, shadow flicker and visual impacts on people living beside wind farms was not adequately assessed in the planning process. Groups campaigning against wind farms had been very active in the public debate with criticism of how local residents

Figure 2. Knowledge Exchange Model



*The Wind Farm Impacts Study report, which is the first of its kind in the world, is rigorous and ensures appropriate siting of wind farms. Studies like this will make sure this improvement continues, and we will consider the recommendations carefully.*



Scottish Government Renewables Routemap (2015; p. 13)

were prepared for the impact, and how it was measured. The question was: was the planning system supporting accurate assessments of these impacts in advance of the schemes being constructed, and were people being sufficiently protected through the planning system.

Through deep and regular engagement across all stakeholder groups we have built relationships between the stakeholders that can be used to continue policy appraisals and deliberations. Our value was not just as ‘host’ for the research but also as chair of the steering group and arbiter of the perspectives represented on that group. The CXC project manager also acted as the public face of the project – projecting independence and neutrality vis a vis the interested public, the media, direct project stakeholders and the onshore wind industry.

Bringing in a wide steering group had profound impact on the design of the [Wind Farm Impacts Study](#). Given the contentious nature of the issue, the credibility of the project rested with having the backing of the full range of stakeholders. Designing this into how the project was shaped and developed provided a forum where the different views could be discussed.

## Livestock Health and Greenhouse Gas Emissions

Methane emissions from ruminants are responsible for approximately 50% of the greenhouse gas (GHG) emissions associated with agriculture in Scotland. This project looked at reducing the emissions intensity, i.e. the amount of GHG emitted per unit of meat or milk produced.

### Success factors

The issue was identified as a priority during a stakeholder workshop. This started a constructive dialogue and collaboration where the researcher engaged extensively with the policy team.

## Community energy in Scotland: the social factors for success

This report identified the social factors which influence the success of community energy projects through the various stages of development, from idea to operation. It used a mix of research approaches and expertise, and reviewed a database of 276 Scottish community projects.

### Success factors

The final report drew on multiple assessment approaches and was presented at a stakeholder event, from which further projects were conceived. The result is a suite of interlocking reports and pieces of analysis on different aspects of community energy in Scotland. These are a unique resource to support policy making that considers renewable technologies, financial mechanisms and community engagement.



*Rather than taking a research programme as a starting point and asking what its contributions to society have been, our approach takes the issues society wants answered as a starting point and asks how much each piece of research has contributed to answering them.*



CXC researchers



*This is an excellent example of successful KE: explaining a technically complex issue in simple yet factually correct words. I will use this for the Agriculture & Climate Change Stakeholder Group and more widely as an example of good practice when writing papers/policy briefings.*



Scottish Government  
Policy Official



*CXC is an effective hub of expertise, providing access to academic research and the co-ordination of academic and MRP support for evidenced policy advice.*



RESAS

## What these case studies say about how we do what we do

### Co-producing briefs, specifications and presentation formats

There were already several academics considering issues relating to community energy projects at the time our [Community energy in Scotland: the social factors for success](#) project. The multi-discipline research team used this empirical research, theories and ideas to enter into dialogue with those responsible for developing policy.

The workshop which presented the final report collected further recommendations from stakeholders. These recommendations were fed into the event summary and have led to further projects, reflecting the iterative nature of the work.

### Clear findings, options and recommendations

The [Livestock health and GHG emissions](#) project was founded on a constructive dialogue and collaboration. The researcher actively engaged with the policy team to ensure they understood what was required and were comfortable asking questions in order to get to a shared understanding.

Despite the technical nature of the analysis, the report has a crisp, plain English discussion with reference to a detailed science annex. This reflects the extensive support provided by the Secretariat on communication and writing style. This ensures we focus on making the research easily accessible for a time-poor customer.

The findings from the livestock project were also presented at a stakeholder meeting, and were very well received.

### Relationship building

Our project on [Community energy in Scotland: the social factors for success](#) has been heavily referenced in policy documents. It demonstrates the value of incrementally building up trust and of co-constructing an evidence base. It is not always possible to deliver this with just one report but it is essential that the first report opens the door to a relationship and to further dialogue and discussion of the evidence and ideas for exploring and testing it further.

Long term engagement and relationship building were also core components of the [Climate change adaptation indicators and trends](#). The project has multiple and very different customers and stakeholders, and the approach needed to be flexibly developed according to the different users' needs.

The project management had to be active – almost embedded in the research team – to ensure that effective engagement secured the researchers access to vital datasets, and that the various strands of research came together to create a coherent and comprehensive body of evidence.

## Climate change adaptation indicators and trends

Monitoring climate change adaptation is a new area of policy and practice. We have established baseline information that gives us a picture of where we are starting from, and projections for the future risks, opportunities and impacts. This makes it possible to assess trends over time, and to understand the nature, extent and effectiveness of adaptation responses.

### Success factors

Science resource was deployed across all areas of adaptation policy and to fill a fundamental knowledge gap. We engaged extensively with the Adaptation Sub-Committee (ASC) and UKCIP (formerly known as UK Climate Impact Partnership), and the Adaptation Scotland programme in Scotland – taking the best of what is being done elsewhere and thinking about how we make this pertinent to Scottish policy makers. The result of the project is a full suite of indicators across sectors. This has value beyond that directly for our policy customers.



*CXC makes use of existing research capacities in a cost-effective way and institutionalises strong links between science and policy through the Secretariat.*



Non-CXC academic

## Citizens' juries on onshore wind farms

This multi-disciplinary research project looked at how people feel about wind farms when they are given an opportunity to learn more about the topic and consider and discuss it as part of a group. Citizens' juries were run over two days each in three locations across Scotland with varying proximity to built and planned wind farms.

### Success factors

The ambitious research design broke new ground, had clear policy relevance and a link to the participation agenda in government. A multi-disciplinary research team needed connections across these agendas, e.g. community participation and onshore wind policy, and was committed to delivering clear recommendations while retaining a high degree of autonomy and independence.



*...there are some very useful recommendations that may give us a mandate for changing the way things are done through that review. This is important stuff, and the report could be a cornerstone of our drive to improve early processes.*



Scottish Government  
Policy Official



*Involving people and communities in decision-making leads to better results, more responsive services and gives communities the chance to have a say on how ideas are delivered. This exciting project offers valuable lessons which will help our efforts to boost participation in local democracy and improve community engagement.*



Marco Biagi MSP,  
Minister for Local Government  
and Community Empowerment,  
address to launch event for  
Citizens Juries report, May 2015

## What these case studies say about how we do what we do

### Providing longer term support in filling fundamental knowledge gaps

The issue of measuring climate change adaptation was raised early on in the planning of ClimateXChange's first work programme. The first Climate Change Risk Assessment needed further analysis and exploration with policy teams; and the first Scottish Climate Change Adaptation Programme (SCCAP) needed better monitoring and evaluation if it was to achieve its aims. The SCCAP also needed a framework for monitoring risks, impacts and action into the future.

The validity of the proposed **Climate change adaptation indicators and trends** project has been proven through interaction with policy teams and also with others working on monitoring and evaluation globally. Scotland can both learn from others and seek to take a lead. The research team worked closely with the ASC, UKCIP and Adaptation Scotland – taking the best of what is being done elsewhere and considering how it can be made relevant in a Scottish context.

### Mix of skills in the project team

A mix of practical knowledge, strong research skills and experience, and professional project management characterises our most impactful projects.

Both the **Community energy in Scotland: the social factors for success** and the **Citizens' Juries** projects had strong multi-disciplinary teams with a clear research lead that worked closely with the CXC Secretariat.

### Topical climate change policy delivering on other government agendas

The **Citizens' juries on onshore wind farms** project was first and foremost researching public engagement and the potential for use of citizens juries in the decision making process. This potentially risky project followed successful public debates on energy policy where CXC contributed a science perspective. The project was based upon our demonstrable expertise and credentials as an independent centre.

Due to its cross-disciplinary nature and the connection with the climate change and participation agendas, the project was owned by CXC, the Edinburgh Centre for Carbon Innovation (ECCI) and the researchers themselves, without a specific policy customer. It had, however, a clear link to the emerging agenda on community engagement and related legislation going through Parliament. As such the project delivered transferrable lessons for any policy area while giving CXC staff experience in running public deliberation events.

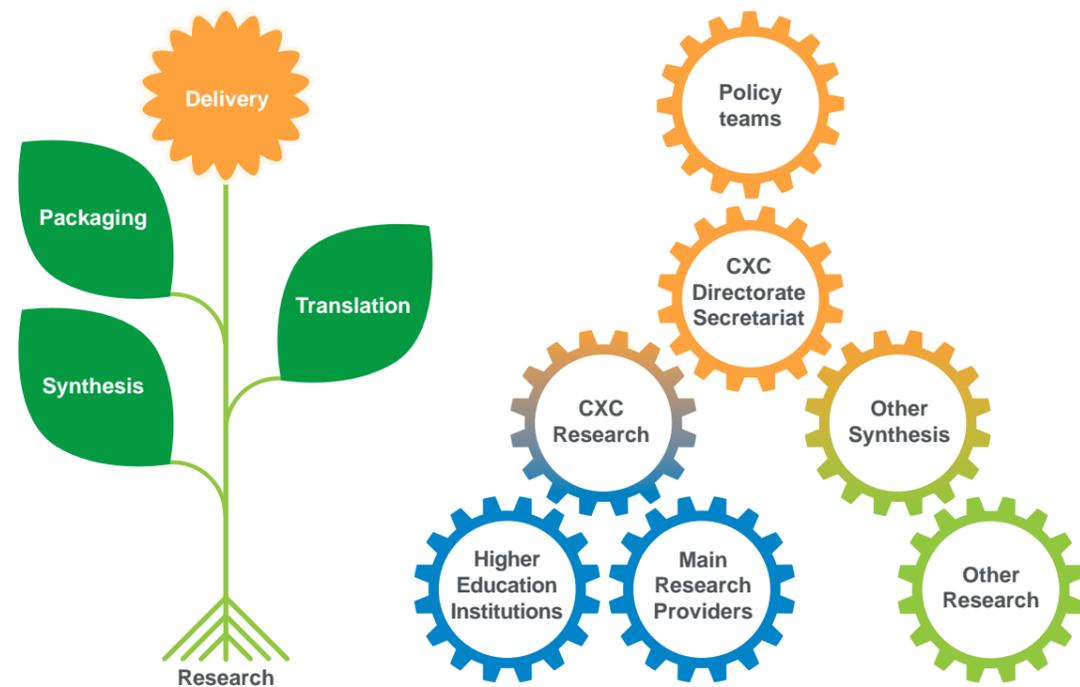
# 05 Lessons

Aligning science and policy is a well-known challenge. Scientists and policy-makers often have different goals, priorities and measures of success. CXC's aim is to bring the two together to create policies and governance informed by the best available evidence.

The examples provided in this report highlight the increasing responsibility placed on CXC as a model of knowledge exchange, and as a trusted centre of expertise<sup>2</sup>.

We believe our model is replicable across other policy topics and in other contexts – such as engagement with industry, communities and NGOs.

**Figure 3. Our input to the policy process**



ClimateXChange's aim is to bring scientists and policy makers together to create policies and governance that are informed by the best available evidence.

<sup>2</sup> In February 2015, the ESRC, along with DECC, EA, DEFRA, NERC and FSA recognised Scotland's Centres of Expertise as models to be learned from in commissioning a new 'Centre for evaluating complexity across the energy environment-food nexus'.

Relationships are critical to overcoming barriers between policy-makers and scientists. CXC's model of a Secretariat to facilitate relationships and act as a knowledge broker appears to be successful in building trust and providing a clear and accessible link for both scientists and policy-makers to operate through.

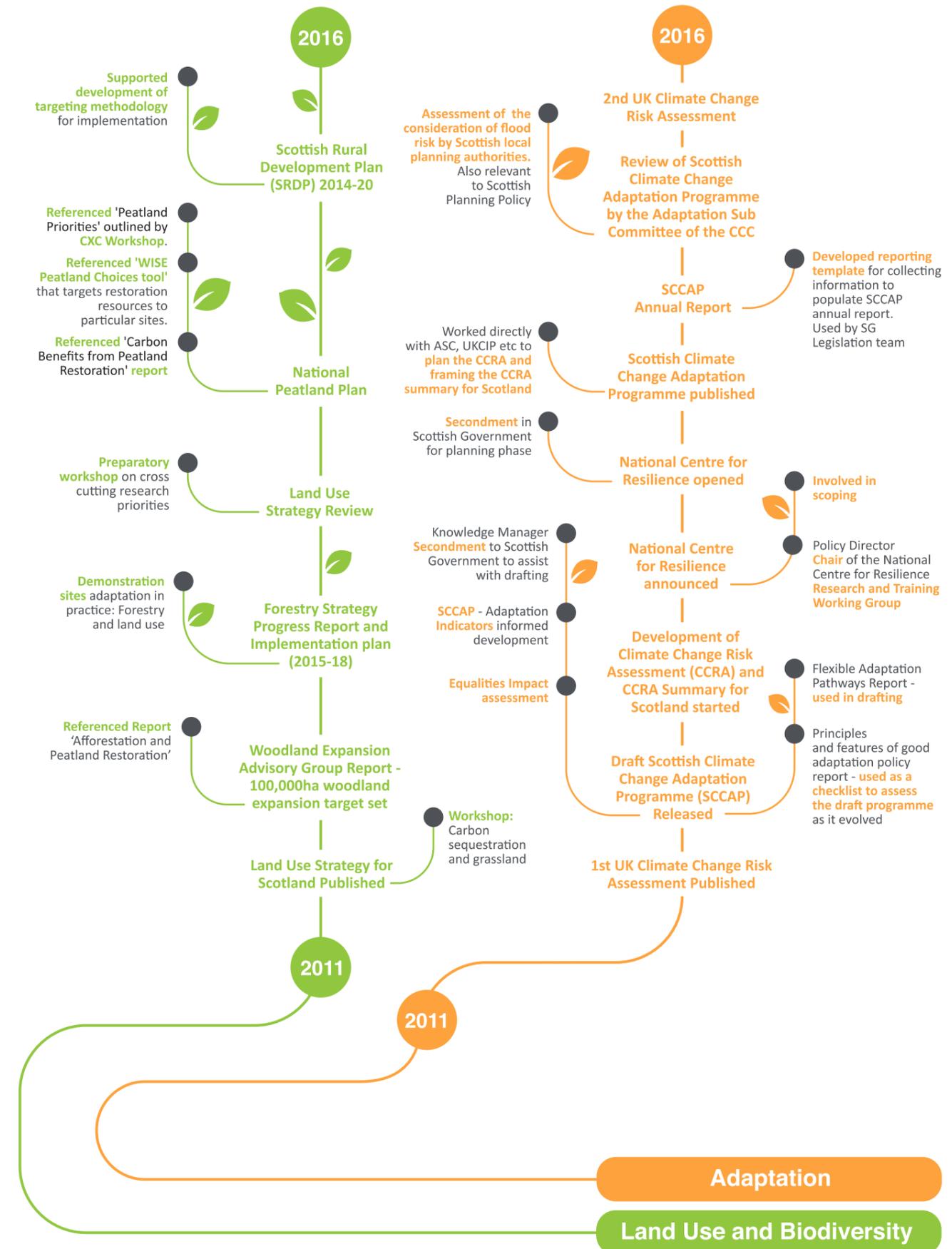
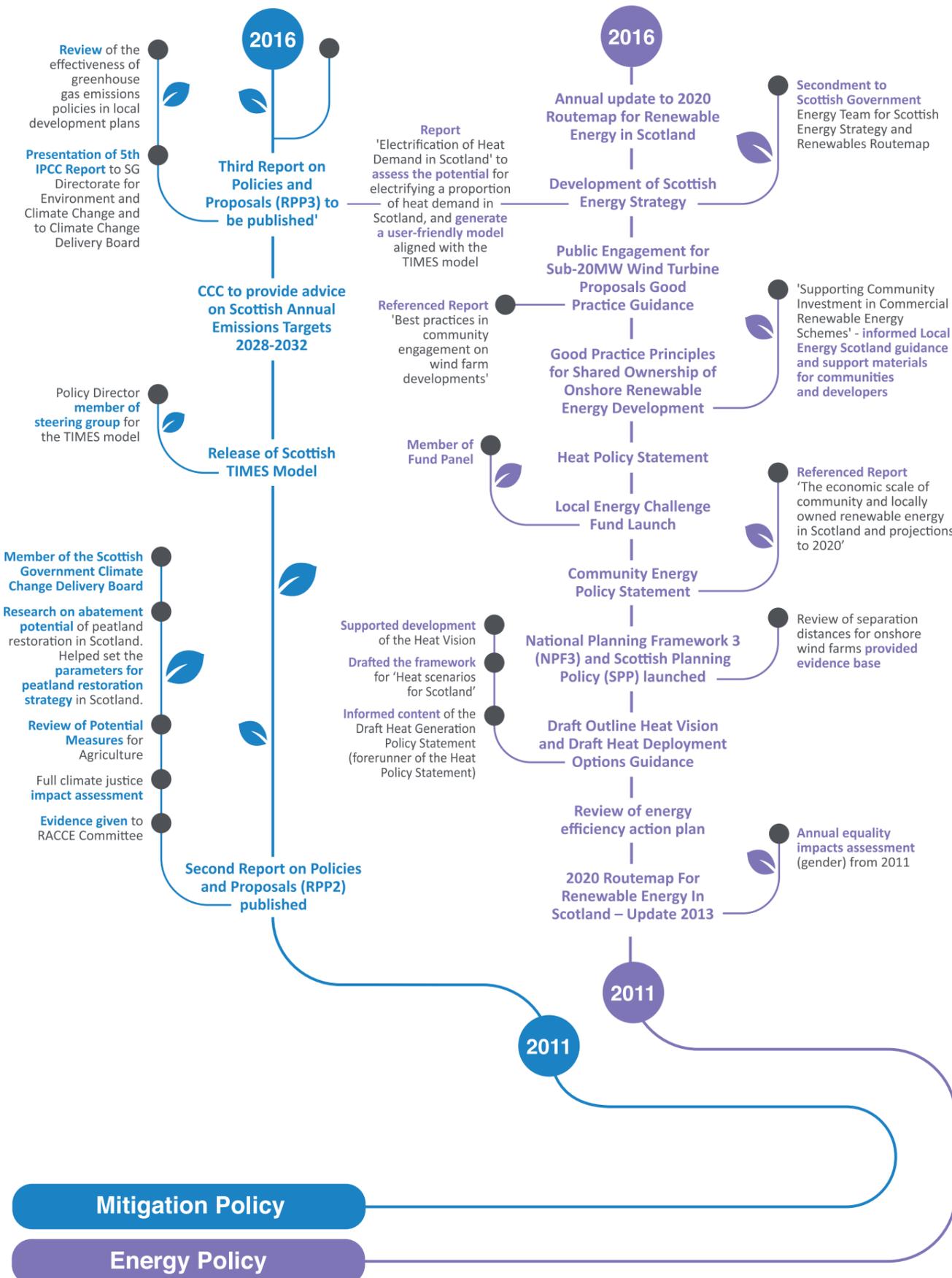
There is no silver bullet: the success of an organisation such as this takes time, repetition, multiple communication channels and methods. It is highly dependent on the context in which it needs to operate, the people involved, and the particular policies in question.

Finding a balance between science push and policy 'demand' pull to a true co-production model is an ongoing challenge and also depends on where the organisation sees itself and what its ultimate aims are. CXC primarily exists to provide scientific expertise to policy makers and therefore currently leans more towards the demand pull model. Whether this function remains static over time will depend on the needs of the Scottish Government as well as satisfaction among researchers.

The timing of research and engagement of scientists is fundamental to ensuring evidence and expertise are targeted at points in the policy cycle where they can have influence and provide benefits. Flexibility at project and organisational level, including the ability to draw on different knowledge and skill bases, also helps science to remain relevant to evolving policy needs.

The incentive for researchers to participate is critical: though the outputs from CXC projects are not academic articles in the traditional sense, there is clear tracking of impact from the research.

# ClimateXChange research, advice and expertise reflected in Scottish Government policy milestones





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