

ADAPTING TO CLIMATE CHANGE EVIDENCE PLAN 2011/12

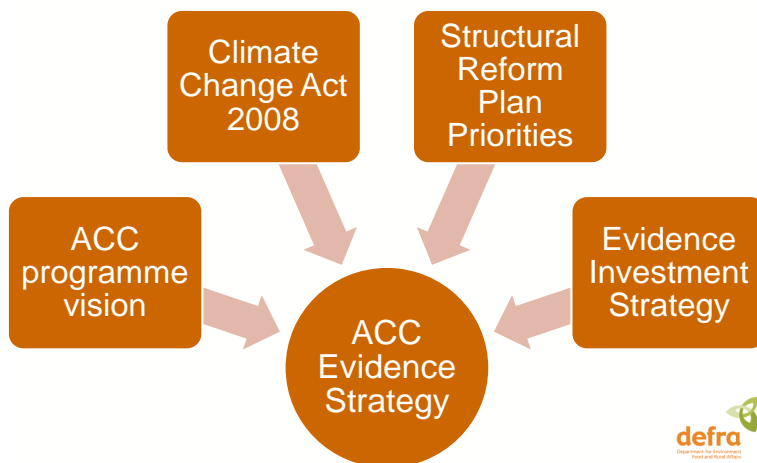
Evidence Plans are part of Defra's business planning processes. They have been developed for each policy programme, ongoing function or hub with a substantial evidence base

The main purposes of Evidence Plans are to help Defra policy and evidence teams to:

- Maintain a clear 'line of sight' between policy objectives and evidence needs;
- Ensure best use of others' evidence and maximise opportunities for partnerships;
- Show a clear rationale and value for money for Defra investment in evidence;
- Prepare for policy evaluation.

1. POLICY RATIONALE

1.1 Policy context



The climate is changing and the United Kingdom needs to adapt to the changes that have already taken place and in order to continue to thrive and prosper through the changes yet to come. Regardless of efforts to mitigate climate change, past emissions commit us to decades of temperature rise and over a century of sea-level rise alongside changes in precipitation and storms.

The rationale for government intervention in domestic adaptation is to address market failures in provision of information and in spurring adaptation. The Stern Review set out the economic case for early adaptation and the case for government intervention was advanced further in the Defra Economics Series paper [Adapting to Climate Change: Analysing the Role of Government](#).

From this context, the overarching Adapting to Climate Change programme vision and key policy outcomes are:

A national adaptation programme that is built on the best available evidence – provided at the right time and with good value for money – in order to help the UK to make good decisions on climate change

in accord with the statutory requirements of the Climate Change Act 2008. The ACC Evidence Strategy to support and drive that vision is to

Provide evidence, analysis and tools to advise, support and challenge policy development, delivery and prioritisation.

The key policy objectives are:

Providing the evidence: develop a more robust and comprehensive national evidence base on the impacts and consequences of climate change, including a national Climate Change Risk Assessment (CCRA) and Adaptation Economic Analysis (AEA) and tools such as the 2009 UK Climate Projections (UKCP09 – see also section 2.3 below for the relationship between ACC-provided evidence and that from Defra and elsewhere).

Raising awareness, and helping others take action: Using targeted communications and customer insight, especially for critical national infrastructure.

Ensuring and measuring progress: evaluate progress and take steps to ensure effective delivery of the Programme's objectives, e.g. through statutory adaptation reporting powers and national indicators.

Government policy and process: embedding adaptation at the EU, national and local level to ensure the need to adapt is integrated in Government policies, programme and systems.

Short and Long Term Context



Major short-term policy deliverables dependent on the evidence schedule:

2012:

- Report to Parliament on the UK Climate Change Risk Assessment – January
- Publication of detailed sectoral risk analysis – January
- Publication of the Adaptation Economic Analysis – July

- National Adaptation Programme developed – December

ACC Programme Evaluation

Outcomes require full integration of policy and evidence

Performance measures overall outcomes not just parts in isolation

Evaluation includes delivery landscape to minimise direct costs



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Progress is measured through regular Programme Review meetings with the SRO and through the Domestic Adaptation Programme Board, Defra Management Board and DASH Board. The Adapting to Climate Change Partnership Board meets once every six months. External assurance includes:

- Review by the Adaptation Sub-Committee (of the independent Committee on Climate Change) of
 - CCRA method (January 2010)
 - CCRA progress (ongoing – due to give formal report mid-2011)
 - Report to Parliament (January 2012)
- Royal Commission for Environmental Pollution assessment in Spring 2010
- Environmental Audit Committee assessment in Summer 2010
- OGC Gateway Review (March 2011)

The Programme Management and Planning Team are currently investigating embedding monitoring and evaluation process into project planning to ensure the effectiveness of projects is understood, lessons are learnt and the Programme is able to operate more efficiently.

2. CURRENT STATE OF KNOWLEDGE, INVESTMENT AND FUTURE REQUIREMENTS

2.1 Current state of knowledge

There is broad international consensus amongst scientists that the climate is changing due to anthropogenic green house gases in the atmosphere. Periodic Intergovernmental Panel on Climate Change (IPCC) Assessment Reports have continued to highlight the causes, impacts and vulnerabilities at a global level; the most recent is the [2007 Fourth Assessment Report](#) with a [Fifth Assessment Report](#) due in 2013.

For the UK, the [UK Climate Projections 2009](#) (UKCP09) provide a view of domestic climate change between 1961 and 2099 with future probabilistic projections based on IPCC socioeconomic scenarios. UKCP09 was produced by a consortium including by the [Met Office Hadley Centre](#) and provide the most comprehensive report on climate change projections in the UK. Hadley Centre core funding is jointly provided by DECC and Defra. The UK's first [Climate Change Risk Assessment](#) is under way and due to report on national, regional and sectoral risks by January 2012. Alongside this, an Adaptation Economic

Assessment is evaluating the costs and benefits of adaptation options.

2.2 Primary objectives of evidence activities

The **ACC Evidence Strategy** is to provide evidence, analysis and tools to advise, support and challenge development, delivery and prioritisation of policy in the ACC programme. This ensures a clear line of sight between policy and evidence and simplifies the management of the flows of knowledge and ignorance between policy and evidence providers. The approach fits with Defra's overall evidence strategy and we work with the Defra Strategic Evidence Group (SEG) to coordinate climate evidence across the department (for example through SEG Evidence Forum workshops) in order to ensure a coherent story is developed efficiently.

Evidence activities are integrated with policy activities and evidence objectives are therefore fully aligned with the missions of the programme projects to which evidence is provided. These missions are:

ACC Team	Team Mission
Evidence	Acquire, coordinate and disseminate evidence on climate change to meet and drive the policy programme needs ; work with the statutory Committee on Climate Change sponsor to manage the Adaptation Sub-Committee performance
Climate Change Risks, Costs and Options	To create the evidence base to underpin targeted and robust Government policies on adaptation. The evidence provided will enable the National Adaptation Programme in England and the Devolved Administrations to understand the level of risk (including opportunities as well as threats) posed by climate change for the UK; to compare the risks posed by a changing climate with other pressures on the Government; prioritise adaptation policy; assess the costs and benefits of adaptation actions.
Central Government Projects	To increase Government's adaptive capacity and ensure that key cross-Government policies promote both built and natural environments that are well-adapted to a changing climate. This will be delivered through existing initiatives, including Departmental Adaptation Plans and the Sustainable Development in Government framework, as well as targeted projects addressing the Built Environment, Green Infrastructure and the planning system.
Infrastructure and Reporting Power	To adapt our new and existing national infrastructure to minimise the risk of future climate impacts and economic disruption to the country. This will be supported by using the Adaptation Reporting Power to improve the adaptive capacity of our key infrastructure sectors, contributing positively to how the country adapts to climate change.
Public and Third Sector	To increase resilience to climate change and build adaptive capacity at local and community levels, working with and through sub-national structures, including civil society. This will be complemented by endeavouring to embed adaptation to climate change into health, police and fire response regulatory frameworks and delivery.
Business, Skills, Innovation and International	To ensure that adaptation is a key element of the green economy. UK businesses have access to the knowledge and skills they need so they are well placed to maximise opportunities and minimise costs. This will be supported by work with the EU and internationally to mainstream adaptation in relevant policies and programmes, in a way that supports innovation and growth.
Programme Strategy and Management	To articulate and ensure effective delivery of the Government's vision for a society that is adapting to the effects of climate change through a national adaptation programme. Active communication and engagement with stakeholders will contribute to the development of this vision; robust planning and programme management will ensure its effective delivery.

Evidence coordination and dissemination The *provision of evidence* through the ACC Evidence Strategy is being achieved through three main routes:

Climate knowledge and ignorance exchange

- Ensuring new knowledge gets into policy
- Ensuring new questions get into research programmes
- Horizon scanning

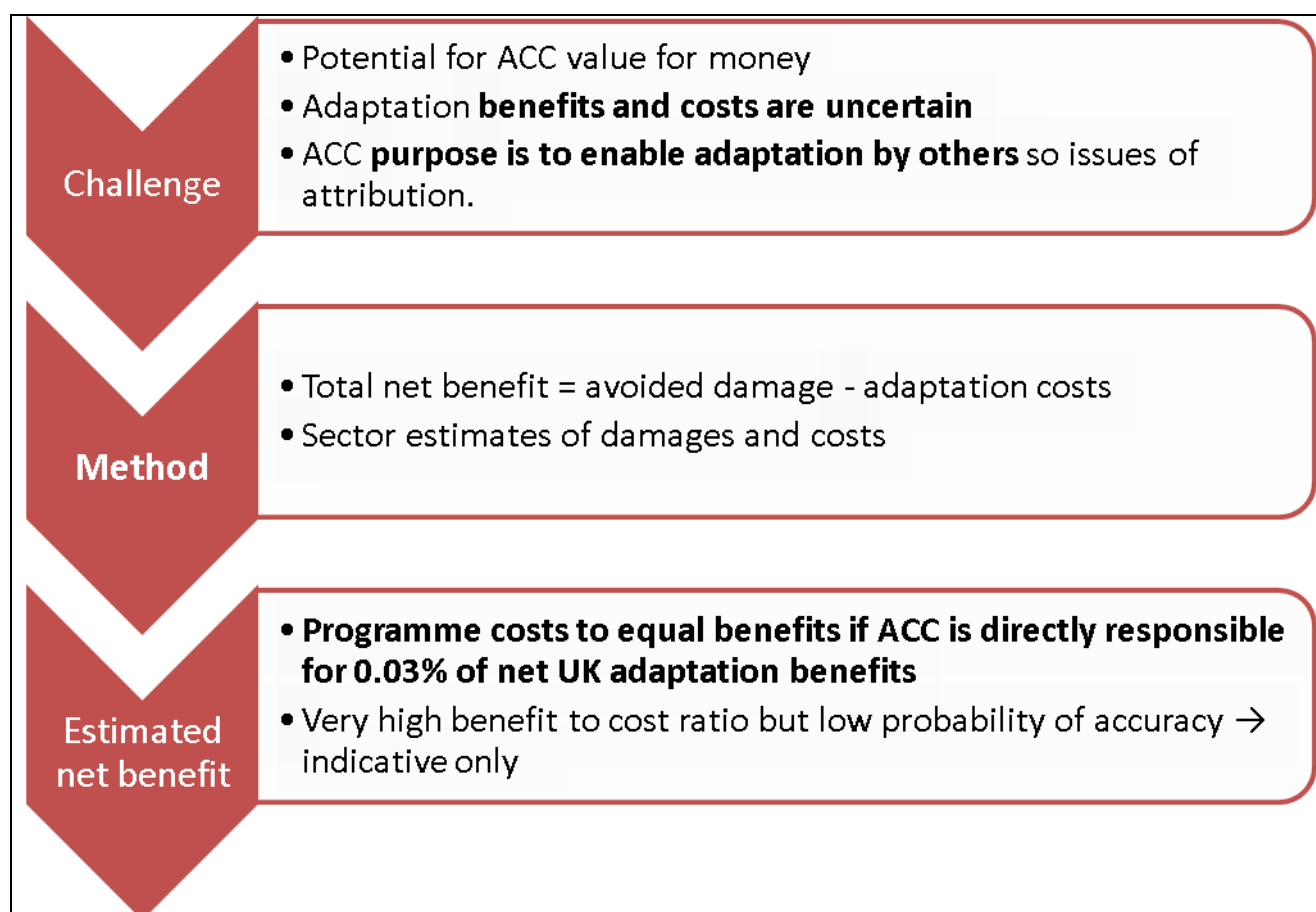
Climate evidence channel

- Policy relevance and end-user focus
- Translation from “science-speak” into language meaningful to non-scientists
- Regular features on the state of play and new understanding

Line of sight coordination

- Regular contact with evidence specialists in all policy teams
- Tracking where evidence is needed and how evidence is applied
- Prioritising resources

Evidence evaluation Together with conventional evidence evaluation measures (e.g. adherence to Defra’s procurement procedures, publication of results in peer reviewed scientific journals, independent review of the outputs as they arise from large programmes), the success of the Evidence team is measured through a common performance objective by meeting the evidence needs of their embedded policy teams and driving the development of policy in those teams in response to new evidence, and through reports on the contacts and outcomes of discussions with stakeholders and suppliers that show how they are being influenced in support of the ACC evidence strategy.



2.3 Current investment in evidence

Evidence for adaptation is acquired and organised in three ways:

- The ACC programme budget addresses cross-government and wider national needs where there is no external market supplying that evidence, for example in basic climate science and projections of the future climate within the UK.
- Research on climate impacts and adaptation options specific to sectors within Defra policy programmes – for example, floods, biodiversity, marine and farming – are funded and acquired by those programmes or through Defra delivery partners such as the Environment Agency and Natural England.
- Research on climate impacts and options by other partners (including other government departments and external organisations) is funded by those partners.

ACC works closely with Devolved Administrations, the Defra Strategic Evidence Group and Defra's agencies and non-departmental public bodies to coordinate climate evidence in support of the Defra [Evidence Investment Strategy](#). The majority of ACC evidence investment covers the whole of the UK (in particular, the UK Climate Projections and the Climate Change Risk Assessment) and is partly co-funded by the Devolved Administrations (although Defra manage evidence budgets on behalf of England and Wales). ACC also works with external partners (including other government departments, the Government Chief Scientific Advisor's office and public sector stakeholders) to advise and assist in acquisition and dissemination of evidence, particularly in the context of those bodies with a statutory duty to report their climate change adaptation plans. However, it is the responsibility of those external bodies to fund their evidence acquisition – ACC does not hold budget for evidence specific to them.

The key areas of evidence spend within the ACC programme budget are research and development programmes with specific contractual deliverables (and approximate 2010/11 budgets):

- Hadley Centre Climate Programme: This long-term programme, co-funded with DECC, provides the climate science and modelling underpinning the UK climate projections and other fundamental scientific evidence relevant to mitigation and adaptation policy
- UK Climate Change Risk Assessment: Producing the first national assessment of the vulnerabilities, impacts and adaptation options for climate change in the UK
- UKCP09 guidance: continued improvements to guidance and case studies on the use of the 2009 UK Climate Projections.
- International impacts of climate change: how climate change impacts overseas will have knock-on impacts on the UK.
- Adaptation Sub-Committee: Defra and the Devolved Administrations fund this independent expert sub-group of the Committee on Climate Change to advise on the preparation of the statutory CCRA and the National Adaptation Programme that will follow.

None of the evidence is mature and key areas of scientific uncertainty in the Hadley Centre Climate Programme in particular are covered in the section below on evidence needs.

Future investment in the Hadley Centre Climate Programme: Defra and DECC are working together to address the recommendations of the Government Chief Scientific Advisor on improving the stability and strength of governance and funding for the Hadley Centre Climate Programme. The departments expect to agree a package that will assure the strategic funding and governance arrangements continue to support this critical national facility over the full Spending Review period.

2.4 Identifying and prioritising new evidence needs

We have identified the strategic evidence needs through assessment of the science embodied in UKCP09 and the current state of global climate science, together with assessment from across Defra (through the Defra Departmental Adaptation Plan and SEG Evidence Forum workshops) of the challenges that climate change brings to Defra policy programmes. The key needs identified are outlined below. Note that the needs related to mitigation are outside the immediate remit of ACC but are included here to cover the complete climate change agenda in Defra.

Enabling adaptation to climate change in the UK

- Risks to the UK as a whole (national security, public sector and commercial operations, citizens) from climate change locally and globally in terms of vulnerabilities and impacts.
- Costs, benefits and other measures of adaptation and the level of inequity in these across the UK.
- Turning evidence into decisions, e.g. suitable models to use with climate projections to enable assessment of the full range of situations and the right analytical frameworks to enable prioritisation of actions to be developed.

ACC leads across Government

- Potential partners: all government departments and public and private sector organisations with climate risks.

Food production, environment and biodiversity in the face of climate change

- Impacts on food security and ecosystems services, ocean processes, biodiversity, food webs, farming and fisheries management.
- Combined impacts of changes in climate and international movement of animals, disease vectors, animal products and people on the incursion and transmission dynamics of infectious diseases of animals and plants.
- Impacts on landscape and biodiversity; ecosystem responses to climate change alongside other pressures and public attitudes.
- Link between biodiversity and ecosystems, food supplies and climate crucial for the understanding of long-term economic well-being.
- Impact on animal and plant diseases, ecosystems, water management, floods and conservation.
- Decision making tools to manage tensions between adapting to climate change and planning against other risks.
- Impacts and effects of adaptive land use on biodiversity; experiments of adaptation approaches; modelling and risk assessment tools; tools for describing connectivity and managing uncertainty; opportunities for conservation; value of biodiversity for adaptation and mitigation.
- Impacts on ecosystem and health of air pollution and ozone.

ACC coordinates through the SEG Evidence Forum

- Potential partners: All Defra delivery bodies and commercial stakeholders

Mitigation of climate change within Defra policy areas

- Defra has a direct influence over roughly 15% of UK GHG emissions and needs to understand and manage the impact of all its policy areas on emissions in order to meet its parts of the statutory demands on emissions through the Climate Change Act 2008 and to promote sustainable, low carbon and resource efficient patterns of consumption and production.
- This points to a number of themes for evidence in this area:
 - Increase our understanding of current and projected GHG emissions in areas where there are large uncertainties – such as agriculture, land management and waste.
 - Find opportunities to reduce GHG emissions in areas where Defra has influence – how much potential is there, and what would be the impact of policies to unlock it?
 - Develop scenarios for the future of Defra policy areas, and understand the implications of this for GHG emissions

CCM leads with SEG Evidence Forum

- Potential partners: DECC (as part of the UK mitigation programme); Industry (agriculture, waste)

Advances in fundamental climate science

- Understanding dangerous climate change and options to avoid it.
- Increased confidence in the sign of changes in climate.
- Long-term marine, wind, snow projections.
- Hazardous events and locations (especially flooding).
- Understanding the implications of international emissions agreements.
- Decadal forecasts with seasonal resolution.
- Improved confidence in regional projections.

ACC leads in partnership with DECC

- Potential partners: All stakeholders have interest in the accuracy and confidence with which we can make statements on future climate; DECC have particular interest in avoiding dangerous climate change and future emissions trajectories.

In addition to the potential funding partners identified above, we are working (through the ACC EU policy team) to match UK needs against EU programmes and influence sources of funding such as FP7 and FP8.

As discussed above, aside from methods such as competitive tendering, we evaluate the entire ACC programme for value for money using an economic assessment framework described in section 2.2 above and are working with the ASC to refine this through analytical work on outcomes and indicators.

2.5 Secondary benefits of evidence activities

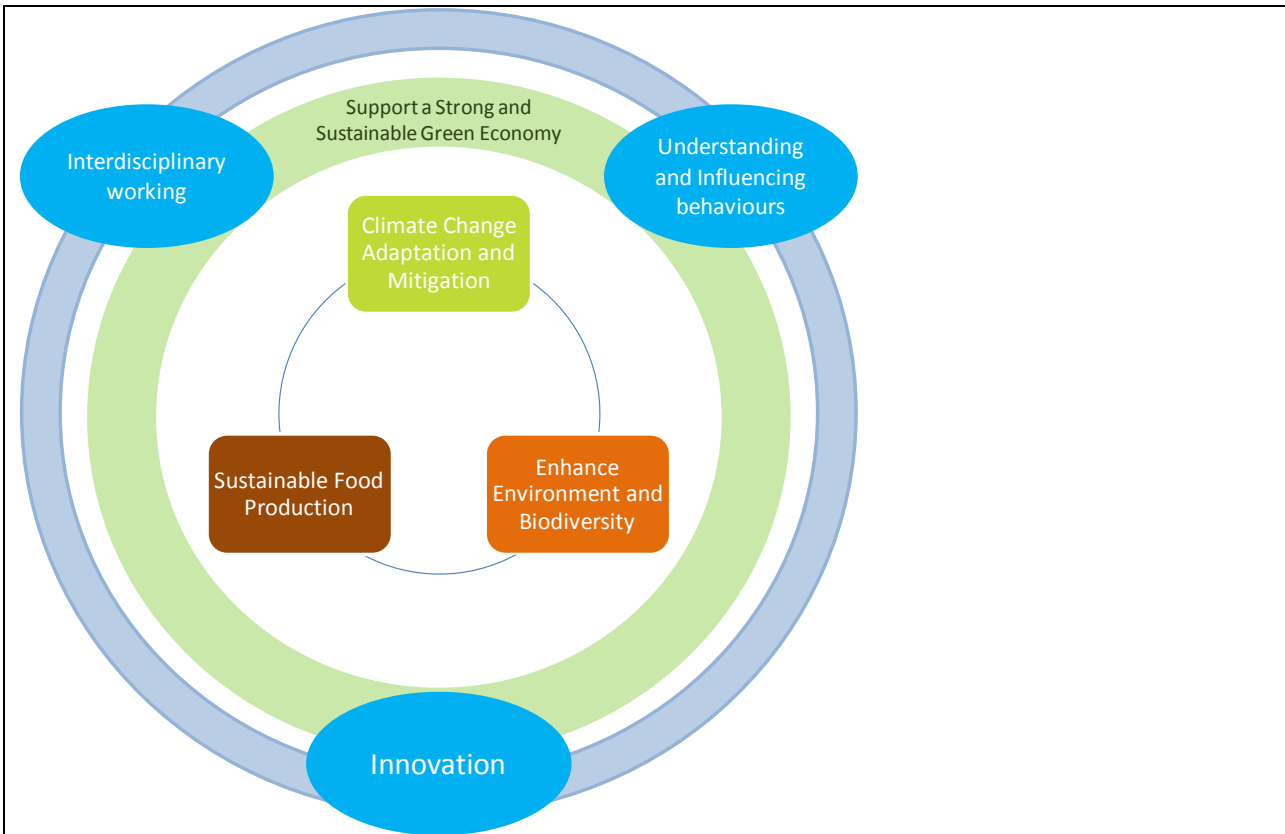
In many cases, climate evidence *is* policy, for example in the information provided through UKCP09 and the Climate Change Risk Assessment. The ACC programme is cross-government and national, so the evidence activities have direct benefits beyond Defra for other government departments, national infrastructure organisations, local government, business and individuals.

The UK is recognised as an international leader in climate change adaptation and our evidence providers (e.g. Met Office Hadley Centre) are world-class research organisations. This gives comparative advantage to the UK in investment and international negotiations on climate change.

Our work with external delivery bodies and other partners (e.g. Natural England, the Environment Agency, the Living with Environmental Change consortium and external customers of the UK Climate Impacts Programme) also provides secondary benefits above and beyond those accruing to Defra from our evidence activities. ACC is also seeing major success building influence with the new EU DG CLIMA on integration of adaptation policy development and delivery.

2.6 Alignment to long-term evidence challenges and Reform Plan objectives

The ACC Evidence Strategy has been closely aligned with the Defra [Evidence Investment Strategy](#) and has been leading the implementation of the EIS in order to sharpen our focus on current evidence needs and improve return on investment.



We are proactively tying climate change evidence to the needs for food security, ecosystems services and biodiversity, for example through Defra Evidence Forum workshops. Although climate change is only explicit in the one, the ACC programme is thus addressing all three Structural Reform Plan priorities, to:

- Support and develop British farming and encourage sustainable food production
- Help enhance the environment and biodiversity to improve quality of life
- Support a strong and sustainable green economy, resilient to climate change

3. INTERNAL CAPABILITIES - USING DEFRA'S EVIDENCE SPECIALISTS

3.1 Range of knowledge disciplines needed

The ACC Evidence Team comprises and depends upon physical, natural and mathematical scientists, social researchers, economists and operational researchers. Through the Defra Departmental Climate Change Plan, we draw upon specialists in all disciplines across the department to define evidence needs and develop plans to fulfil them.

In particular, we draw on specific knowledge in the fields of climatology and Earth systems, economics, ecology, oceanography, statistics and mathematical modelling, meteorology and risk management.

3.2 Access to internal specialists

ACC has access to:

Economists(provided by the Natural Environment Economics team, as part of the Wildlife and Countryside ongoing function), through which ACC has access to up to three FTE economists.

A social researcher (currently works fulltime managing the Climate Change Risk Assessment).

In addition, the Climate Change Risk Assessment project encompasses a wider In-House Experts Group and draws upon other external experts covering all of the sectors under assessment. Expertise for other disciplines – for example, engineering – is drawn ad hoc from stakeholder groups.

3.3 Future resource needs and filling gaps in expertise

Future needs for skills will continue to be driven by the policy programme which, in turn, will be driven by the major evidence (the CCRA). During the first statutory reporting cycle (to end 2012), we expect the current mix of skills to be stable, but it is likely that the mix needed in subsequent cycles will differ in relative capacity, though unlikely to differ significantly in disciplines covered. An exception to this is that the need to deploy social research expertise in a greater proportion on more ‘pure’ social research projects to help communicate and frame aspects of climate risk as the major evidence is reported in 2012. Greater social research input will also help to interpret the potential roles of ‘nudge’, community resilience and Big Society in the policy area. ACC also anticipate a demand for decision support expertise around risk-based decision making.

4. EXTERNAL KNOWLEDGE SUPPLY AND PARTNERS

4.1 Strategic external capabilities and suppliers

4.2 Leverage and partnerships

Influencing external research and evidence budgets – in the UK, the EU and internationally – is vital to acquiring the climate evidence the nation needs. In the UK, we work closely with the Welsh Assembly Government part of a shared evidence budget covering England and Wales, the Living With Environmental Change (LWEC) partnership and directly with individual Research Councils to raise their support of the ACC programme aims in their fundamental research. We seek to leverage excellence, e.g. through ACC’s delivery partners chairing the ARCC (Adaptation and Resilience to Climate Change in the Built Environment) coordination network of research councils and construction industry stakeholders.

In the EU, ACC is working with DG Climate Action and DG Research to promote the principle that countries should work together to address what are, at their heart, global questions on the impacts, vulnerabilities and adaptation options.

ACC is also developing and expanding collaboration with other countries, for example through the FCO Consulates in the USA, through the Government Chief Scientific Advisor and through encouraging the Met Office to develop links with countries that have adopted its Unified Model.

4.3 Use and value of advisory bodies and external specialist advisers

The Adaptation Sub-Committee (ASC) of the Committee on Climate Change (CCC) have a statutory duty (under the Climate Change Act 2008) to advise the Secretary of State on the assessment of national risks from climate change and the nation’s readiness to address them.

The ASC adds value both through providing scrutiny of the ACC programme progress and outcomes, and through development of external and independent research into national adaptation needs. Their effectiveness is evaluated as part of the formal framework and concordat agreed between DECC, Defra, the Devolved Administrations and the CCC.

Other external specialist advice is obtained through the Hadley Centre Climate Programme and the CCRA contracts, the Cranfield Risk Centre, through consultations with EU policy and research groups and through participation in IPCC processes.

5. MEETING NEW EVIDENCE NEEDS

5.1 Overall approach to meeting your evidence needs

Much of this has been covered in detail in the sections above.

On future links with external partners, we are working with the Government Chief Scientific Advisor to develop a long-term and sustainable funding structure for climate science and climate change evidence, in particular to meet the urgent and growing need for major investment in high-performance computer facilities that will be needed for the next generation of Earth Systems models. It is likely that this will lead to reorganisation of funding within government and increased exploitation of international collaborations among leading industrialised countries.

In addition, we are developing our relationship with the UK research base through the LWEC programme in an effort to ensure that work carried out under the UK Research Council funding is properly and effectively exploited and that future funding takes into account the needs of the nation to address climate change.

5.2 Evidence investment forecast

Annex

Key references supporting the current state of knowledge [\[Return to Section 2.1\]](#)

IPCC Assessment Reports:

www.ipcc.ch/publications_and_data/publications_and_data_reports.htm

Adapting to Climate Change: Analysing the Role of Government:

www.defra.gov.uk/environment/climate/documents/analysing-role-government.pdf

2009 UK Climate Projections:

www.defra.gov.uk/environment/climate/projections/

UK Climate Change Risk Assessment and Adaptation Economic Analysis:

www.defra.gov.uk/environment/climate/adaptation/ccra/

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