Environment, Climate Change and Land Reform Committee

Draft Budget 2018-19

Written submission from EPIC: Centre of Expertise on Animal Health Outbreaks

Centres of Expertise

How is the centre of expertise engaged in the development of the strategic research programme?

EPIC is an independent, policy-responsive consortium which fulfils an important and specific role for Scottish Government: to deliver the highest quality scientific evidence to support the prevention of, preparation for and eradication of important animal and zoonotic diseases in Scotland. The EPIC Centre of Expertise model is unique in the UK, providing timely science-policy advice and expert capacity in disease outbreak emergencies. A recent example of this is the critical support provided by EPIC to Scottish Government in their response to the avian influenza outbreak of 2016-17.

A key element of EPIC is the framework we have developed over the last 11 years to work collaboratively with colleagues in RESAS and Scottish Government on an on-going basis to identify, formulate and deliver projects which provide scientific and other evidence to support policy decisions and policy development. We have a close and continuously ongoing dialogue with Scottish Government and RESAS. This is manifest formally through six-monthly 'interface meetings' between EPIC scientific teams (Topics) and Scottish Government policy colleagues and RESAS, but is maintained continuously on an informal basis. These links have been greatly facilitated by the innovation of having one or more EPIC scientists ('knowledge brokers') 'embedded' in Scottish Government Animal Health and Welfare Division (AHWD) at Saughton House, using that as a regular place of work and liaising closely with policy colleagues and RESAS contacts on a day-to-day basis. Policy colleagues in AHWD and APHA can request advice, and EPIC scientists will then engage in a dialogue to develop a plan of work to meet the needs of SG. At the same time, a crucial part of our working is to horizon scan for emerging threats and risks on behalf of SG, and EPIC scientists use their experience and scientific expertise to identify potential problems arising which could benefit from attention by EPIC. These are then proposed to policy colleagues for consideration, modification and approval. The two-way dialogue which ensues is vital in helping formulate and prioritize activities which will be of value to SG. In so doing, we work together to identify the future evolution of policy needs and tailor the research programme accordingly.

Whilst roughly one third of (13/42) of EPIC's scientists are based in HEIs, we think it useful to emphasize that many of the scientists working on EPIC from the SEFARI institutes are part funded to work on EPIC and part funded to work on the Strategic Research Programme (and, in some cases, from Underpinning Capacity monies). Thus, there is a critical co-dependency between work in EPIC and work elsewhere in the Strategic Research Programme. This dependency is both tangible, in terms of supporting the availability of a sufficiently diverse body of scientists to provide the

expertise we require, and also more intangible, in terms of supporting the more strategic research that scientifically underpins much of the policy advice we provide.

How is the centre of expertise funded (project based or rolling funding)? are there set timescales attached to the funding and does this pose any operational challenges?

EPIC's funding is rolling, with a portfolio of work consisting of individual projects each with its own finite timeline. The consortium submitted costings for a 5-year programme of work when we tendered in 2015/16, building on two previous 5-year programmes under the EPIC banner. Rolling on-going funding is essential for the way EPIC works because our remit includes an element akin to 'national capacity': an emphasis on preparedness and the need to have a well-trained, well-prepared and well-rehearsed body of scientists ready to respond in the event of a major animal disease outbreak. In practice, funding timescales are always one year at a time, with confirmation of budget in March for work due to begin in April. This generates logistical constraints in that it is this difficult to plan work beyond one financial year and presents significant challenges in terms of staff retention (particularly in the HEI partners) because of a perceived lack of job security, especially for posts that are 100% EPIC funded. Resilience and continuity of personnel and tools are essential elements of the way EPIC offers supports Scottish Government responsive capacity, and a longer-term funding model would make this considerably easier.

How their work programme and priorities link with areas of Scottish Government policy priority, including those set out in the National Performance Framework and the needs of end users?

The focus of EPIC activities is in maintaining and improving productivity, specifically in the livestock sectors of Scottish agriculture. It will only be possible to realize our full economic potential in agriculture if we minimize the impact of infectious disease outbreaks on the livestock sector, by reducing the risk of introduction, establishment and spread of infection. Our work also has potential to support a stronger rural economy, albeit in the somewhat negative way of trying to avoid massively dislocating negative shocks.

The work of EPIC on outbreak response and contingency planning also requires close working with policy colleagues in Defra and APHA representing the rest of UK. Members of EPIC routinely contribute to UK level groups such as the National Emergency Epidemiology Group (convened only during an outbreak of disease) to ensure that Scotland receives the best possible advice on outbreak management. As stated in previous answers, both through Scottish Government Animal Health and Welfare Division General Stakeholder meetings, and through our own extensive programme of KE with the animal keeping, animal health and public health communities in Scotland and beyond, we maintain close and mutually supportive links with all our end users.

How does the centre work with other higher education institutes and research providers?

Two HEIs, the University of Glasgow and University of Edinburgh, are long standing and core members of the EPIC consortium (the current Director is employed by the University of Glasgow). These HEIs, through their veterinary schools and associated research institutes, represent the principal concentration of animal health expertise outwith the SEFARI institutes in Scotland. In addition, EPIC retains links with former members of the consortium who have moved to other HEIs (notably University of Stirling), especially those in Scotland. Another Scottish HEI (University of Aberdeen) is represented on our Steering Group. All EPIC scientists maintain collaborations with scientists in universities and research providers throughout the world, and this network, and the discourse that occurs through it, contribute both ideas and recognition to the work that EPIC does.

Innovation Funding

Does the centre receive innovation funding? If so, how has this supported collaborative working and what have the outcomes been?

The Centre does not directly receive innovation funding. However, such funding does partially support the work of at least one scientist from a SEFARI institute who is a collaborator within EPIC, and hence may indirectly inform work delivered through EPIC.

Underpinning Capacity

What activities are supported by funding to underpin capacity? What costs are attached to this and what are the expected outcomes?

No activities are directly supported by underpinning capacity funding. However, as for Innnovation Funding, such funding for other activities in the SEFARI institutes does, in some cases, help to maintain capacity and develop underpinning knowledge for scientists who are also part of EPIC. Within the SEFARIs, such funding has a role analogous to elements of funding from the Scottish Funding Council to the HEIs. In general, it may be useful to think of individual SEFARI scientists as having a portfolio of work, delivering to different projects, funded from different elements of the wider Strategic Programme and also from other funding sources. This approach maximises robustness, but does mean that changes to any individual funding stream may have unpredictable effects on the capacity available for other projects.

How secure is this funding stream?

The EPIC consortium has no collective opinion in this matter.

Scottish Environment, Food and Agriculture Research Institute

How do you work with SEFARI?

As organizations, most of the SEFARI institutes are an integral part of EPIC.

EPIC works closely with SEFARI Gateway on Knowledge Exchange to ensure that we have a coherent and complementary programme of KE with all relevant stakeholders. The remit of SEFARI Gateway does not include the HEI partners in EPIC and it is clear from our discussions with Scottish Government Animal Health and Welfare Division and our RESAS project officer that EPIC is expected to develop and maintain our own proactive programme of KE, but we are eager that this should wherever possible be delivered jointly with, and be recognized as part of, the SEFARI 'brand'. We have been proactive about engaging with SEFARI Gateway to make sure this happens.

What additional benefit does it bring to the centre?

SEFARI Gateway has brought

- A very welcome focus on the importance of KE with multiple audiences at all stages of the research process.
- An easily approachable and supportive group of experts with whom to consult and collaborate.
- A means of coordinating KE activity so that we avoid duplication of effort, mixed messages and stakeholder fatigue.

Contract Funding

The funds available through the contract research budget have declined significantly. How has this impacted the work of the centre?

It has not done so directly. Indirectly, it may have an impact on other work that sustains scientists who are members of EPIC and/or on the underpinning knowledge that EPIC works with to provide policy advice, but we are not aware of any concrete examples of this.

Additional issues

What do you consider to be the key challenges for the centre, the research community and research funding in Scotland over the next 10 years?

- The UK's withdrawal from the European Union (see also below). This will influence research and policy priorities, security of research funding and Scotland's ability to attract and retain relevant expertise.
- Assuming that current funding trends continue, redefining priorities in the context of reducing resources, especially given increased uncertainty about the needs and threats associated with the livestock industries.
- Providing security of funding over longer-term periods to attract, sustain and retain high quality researchers to provide evidence in support of policy.
- Allied to this, finding a resolution to the tension between academic metrics, based largely on grant income and research publications, and policy needs for timely, applied solutions to quickly emerging and changing problems. This manifests as a tension between the career 'needs' of staff and the immediate requirements of EPIC projects.

Specifically, what is the estimated impact of withdrawal from Europe on the centre, the research community and funding available to rural, food and environment research in Scotland?

- Capacity:
    - Loss of expertise from those highly trained EU scientists unsure and/or unhappy about future prospects in Scotland.
    - The level of resourcing available directly drives the capability and resilience of a team such as EPIC. A reduction will reduce our efficacy.
- Risk:
    - The needs of the livestock production economy are increasingly uncertain. It remains to be seen what livestock production will look like, and specifically who will be farming what, where and how. The decisions made in this respect seem likely to have profound impacts on disease risks and the available options for their mitigation.
    - Potential changes in animal health and welfare policy and in the associated regulatory regimen have potential dramatically to change the outlook in terms of priority disease risks and food safety and security.
    - Potential changes in trading partners and patterns, and the standards associated with those, have potential dramatically to change the outlook in terms of priority disease risks and food safety and security.
    - Relationships with the rest of the UK could also change, resulting in altered working relationships and accords that might affect operational priorities and the capacity to respond to animal disease outbreaks in Scotland.

What steps do the Scottish Government and research organisations need to take to address those challenges?

It will be essential to support and prioritise strong and trusting, **collaborative**, interdisciplinary working relationships between research groups, Scottish Government, industry and other stakeholders to attract and retain an effective and innovative capacity to inform policy and industry practice. A thorough understanding of how science and policy need to work together, each recognising the need to sustain the other, is critical. This means adopting a longer term view of strategy, and offering longer term security to prioritized research capacity, with the explicit proviso that there needs to be flexibility to respond to evolving policy needs.

ANNEX: BACKGROUND TO THE CENTRES OF EXPERTISE

i. The three existing Centres of Expertise (CoE) were first commissioned in April 2011, as part of a strategy by RESAS to increase the relevance of its research base to policy teams in Scottish Government. They focused on water and its management ('**CREW** www.crew.ac.uk), animal disease outbreaks ('**EPIC**' www.epicscotland.org) and addressing the challenges posed by climate change ('**ClimateXChange**' www.climatexchange.org.uk). The Centres were designed to deliver timely, high-quality research and advice to support policy teams and key delivery partners, and in the case of EPIC to provide emergency preparedness and response.

ii. In 2016/17 the Centres received approximately 11% of the total £48.5M investment (**CREW £1.0M, EPIC £1.98M and CXC £2.4M**). Despite receiving a relatively small proportion of the total funds 49%[1] of all policy outputs delivered from the RESAS investment come from the three CoEs, and 43% of all representations on Government advisory groups were by CoE staff and researchers representing CoEs, reflecting the CoEs policy facing remit and consistent delivery[2]. The proportion of policy outputs and representations on Government advisory boards attributed to CoEs has been on an increasing trend since 2011-12, indicating that they are increasingly used by policy teams[3].

iii. Although the current CoEs differ from each other in their origin, governance and operational procedures, they share common objectives in that they were established primarily to provide accessible, comprehensive advice to support policy. In addition, the Centre construct has generated considerable additionality and accelerating impact and in amplifying the value of research undertaken across the partner organisations. (see Annex B). In summary, ensuring that the right information is provided to the right people, in the right format and at the right time.

iv. In summary, the CoE model seeks to;

- Provide policy-ready advice and evidence;
- Improve the scope, scale and efficiency of access to research by the user community;
- Leverage access to and influence on, wider research for policy impact
- Create new partnerships between Research Institutes and Universities;
- Increase collective research capacity - a strategic platform for new and more efficient collaboration;
- Mobilise and influence extensive scientific capacity to respond to societal priorities;
- Generate new cross-sectoral knowledge driven by real-world needs
- Tailor approaches to user needs;

[1] Scottish Government's Strategic Research Portfolio. Annual Metrics Summary 2016-17 Rural Affairs, Food and Environment Research Strategy for 2016-2021: http://www.gov.scot/Publications/2015/02/8798

[2] In 2015-16, the three Centres received 12% of portfolio funds, and generated 48% of policy outputs (such as briefings, reports and submissions to public consultations)

[3] Rural Affairs, Food and Environment Research Strategy for 2016-2021: http://www.gov.scot/Publications/2015/02/8798

- Exemplify world-leading approaches to science-policy knowledge exchange;
- Improve policy processes and outcomes (see Annex B).

Annex A - ***Further details on the Centres of Expertise***

1. Each centre has developed independently and each operates a slightly different model. All CoEs provide a call-down advice service and research-based evidence to support policy development and implementation. However, whereas CREW contracts out research projects on a competitive basis, EPIC employs its own team of post-doctoral fellows (PDRFs) to undertake evidence work and to provide emergency response in the event of disease outbreak. CXC employs PDRFs and contracts out research projects.

2. Scotland has 19 HEIs[4], six SEFARI Institutes[5]; and 5 research centres/institutes[6] that receive NERC or BBSRC national capability funding. In 2016, four research councils were supporting over £540m[7] of non-medical scientific research in Scottish universities (excluding capital and training).

3. CoEs involve non-SEFARI partners, which are primarily Scottish HEIs. SEFARI has received 54% of the £32.7m invested in the CoEs between 2011-2016, with most funding being allocated to JHI/BioSS (£12.5m) and SRUC (£3.7m). ClimateXChange received the highest level of investment, followed by EPIC and then CREW (Fig. A1).

4. Twenty-four of the 41 EPIC researchers are either at the University of Glasgow (7) or the University of Edinburgh/Roslin Institute (5) or SRUC (12). Since 2011, CXC has partnered with 99 researchers across 9 Scottish HEIs and CREW has partnered with 73 researchers, also across 9 HEIs.

5. Strengthening, formalising and funding links between the SEFARI (Scottish Environment, Food and Agriculture Research) Institutes and the University sector in Scotland to create the CoEs has been critical to their success. This increased collaboration broadened the supply base and strengthened the flow of research from basic research through applied research, into policy and practice.

6. A review of the RESAS research portfolio in 2014 reported that the CoEs are well-regarded and have a role to play in increasing flexibility for rapid response knowledge exchange within the portfolio. The RAFE research strategy 2016-2021, published in February 2015, stated that RESAS would continue to support the three current Centres, and that a new Centre on Plant Health would be

[4] Universities of Aberdeen, Abertay, Dundee, Edinburgh, Edinburgh Napier, Glasgow, Glasgow Caledonian, Heriot-Watt, Highlands and Islands, Open University in Scotland, Queen Margaret Edinburgh, Robert Gordon, St Andrews, Stirling, Strathclyde, West of Scotland, the Glasgow School of Art, Royal Conservatoire of Scotland, and Scotland's Rural College.

[5] James Hutton Institute; Moredun Research Institute; Scotland's Rural College; Rowett Institute of Nutrition and Health; Biomathematics and Statistics Scotland; Royal Botanic Garden Edinburgh.

[6] CEH (NERC), BGS(NERC), SAMS (NERC), SMRU (NERC), Roslin Institute (BBSRC).

[7] NERC: £56.6m; BBSRC: £151.7m, ESRC: £7.7m, EPSRC: £323.9m. Excludes capital and training.

established. It also committed to working with stakeholders to look for opportunities to develop further Centres in areas of need.

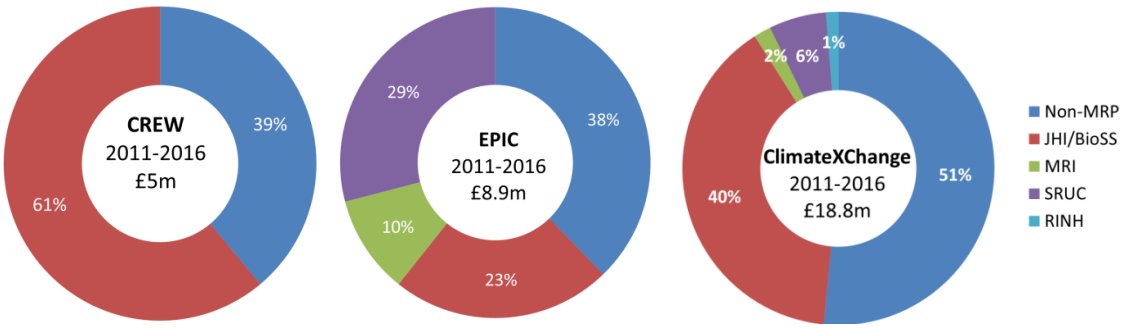

Figure . A1. Distribution of CoE funding between individual SEFARI (MRP) Institutes and non-MRPs (primarily) HEIs) over the period 2011-2016. Total funding for each CoE for 2011-2016 is presented in the centre of each plot.

7. Over time, the reach of the CoE's has expanded. A recent analysis by RESAS indicated that although the operational models of the Centres are different, the number of collaborations has increased over time[1].

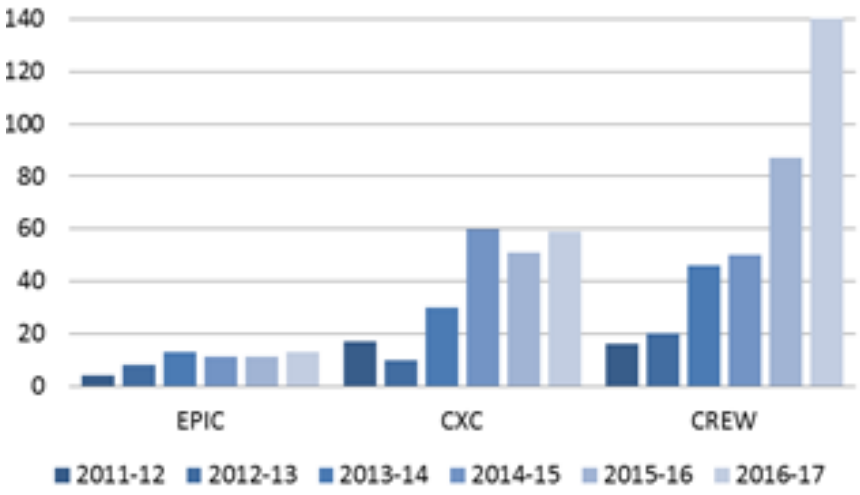

Figure A2: CoE collaborations 2011-17

Who are the policy customers for the Centres of Expertise?

8. **CREW** primarily supports Scottish Water, Scottish Environment Protection Agency, Drinking Water Quality Regulator, Water Industry Commissioner, Scottish Natural Heritage, Scottish Government and other associated bodies. Support is themed around River Basin Management Planning (RBMP), flooding and coastal erosion, drinking water quality, sustainable rural communities, driven by policy need. Environmental and institutional resilience to change is a common

them across all areas (Fig. A3). CREW delivers projects, analysis, guidance and expert opinion, and undertakes strategic foresighting and scenario analysis on emerging issues.

9. **EPIC** is primarily concerned with preparedness and supports policy and veterinary officials in the Animal Health & Welfare Division in Scottish Government. Most projects are requested by the Exotic Diseases team and all include other policy and/or industry customers (Fig. A4). In addition to undertaking specific projects, EPIC undertakes research and knowledge exchange activities that are co-designed with policy and industry stakeholders, undertakes horizon scanning and scenario planning for Scottish Government and maintains datasets and develops models in order to provide analysis and evidence to Scottish Government, Scottish or UK policy customers or industry.

10. **CXC** primarily supports the Scottish Government on issues related to energy (technologies, deployment, demand, efficiency and behaviours), agriculture, peatlands and climate change impacts and adaptation. Within Scottish Government, CXC mainly supports the Energy and Climate Change and Environment and Forestry directorates (Fig. A5).

11. *Linkages to the wider knowledge exchange programme of the Strategic Research Programme;* SEFARI Gateway is the knowledge exchange centre associated with the Scottish Government's Strategic Research Programme (SRP) and along with the CoEs it is designed to improve the flow of research and expertise to end users through co-production of knowledge. Whilst the drivers and audiences for each of the CoEs and SEFARI Gateway, are slightly different, there is a shared recognition that the landscape for end users, whether they are policy, business or public, has to be as clear as possible. To this end, SEFARI Gateway and the CoEs work together to ensure clarity about roles, and coordinate their activities so that the entry points to their expertise are clear to end users. Furthermore, the CoEs and SEFARI Gateway meet regularly at a strategic level, to ensure work takes place in the most appropriate area of expertise and that opportunities for joint work (either on outputs, or in relation to activities which may benefit all (for example development of a social media strategy) are utilised effectively.

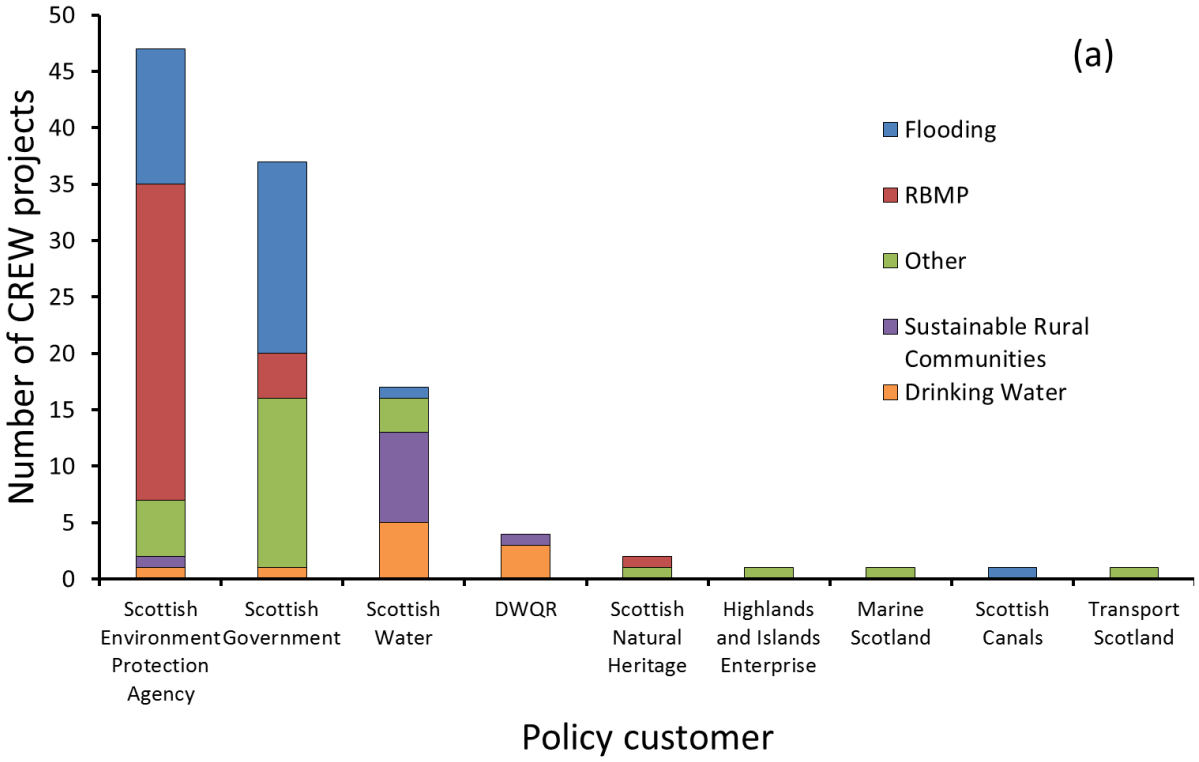

Fig. A3: Number of CREW projects by policy customer and topic. CREW undertook 111 projects with a total value of £3.3m over the period 2011-2016.

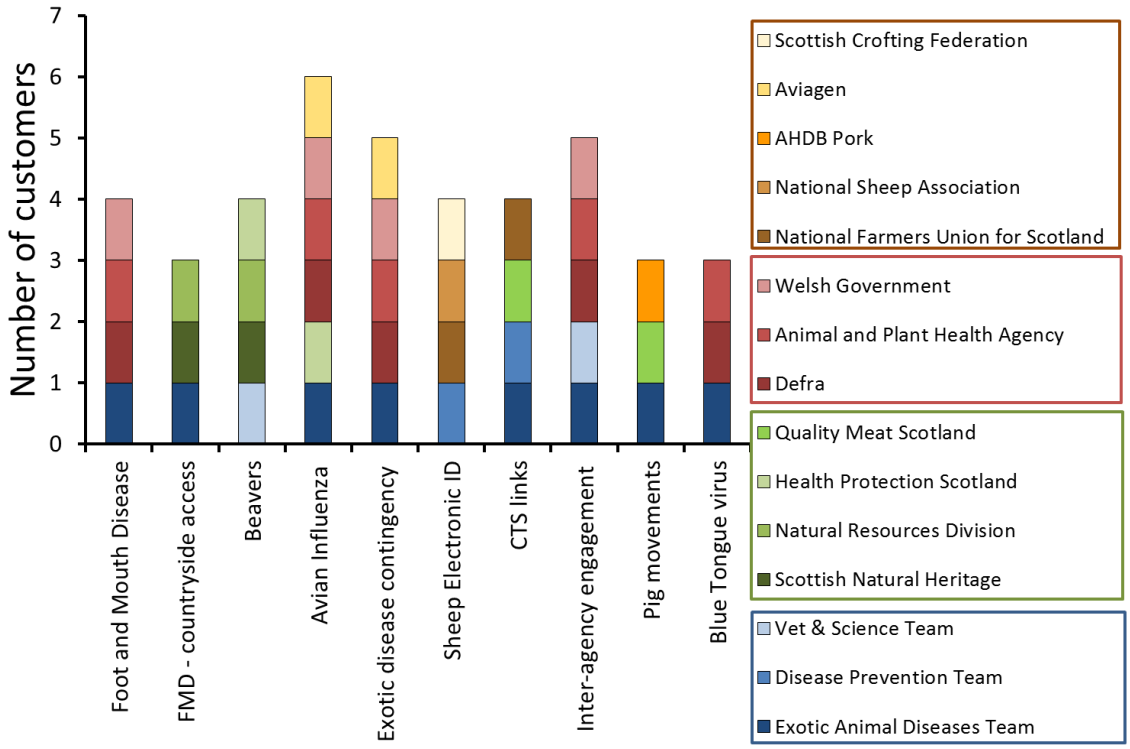

Fig. A4: EPIC projects by policy/industry customer and topic. All projects were requested by at least one team within the Animal Health & Welfare Division of Scottish Government (blue bars). Additional policy customers were either from other Scottish Government agencies or divisions (green bars), other UK governments or agencies (red bars) or industry bodies (brown-yellow bars).

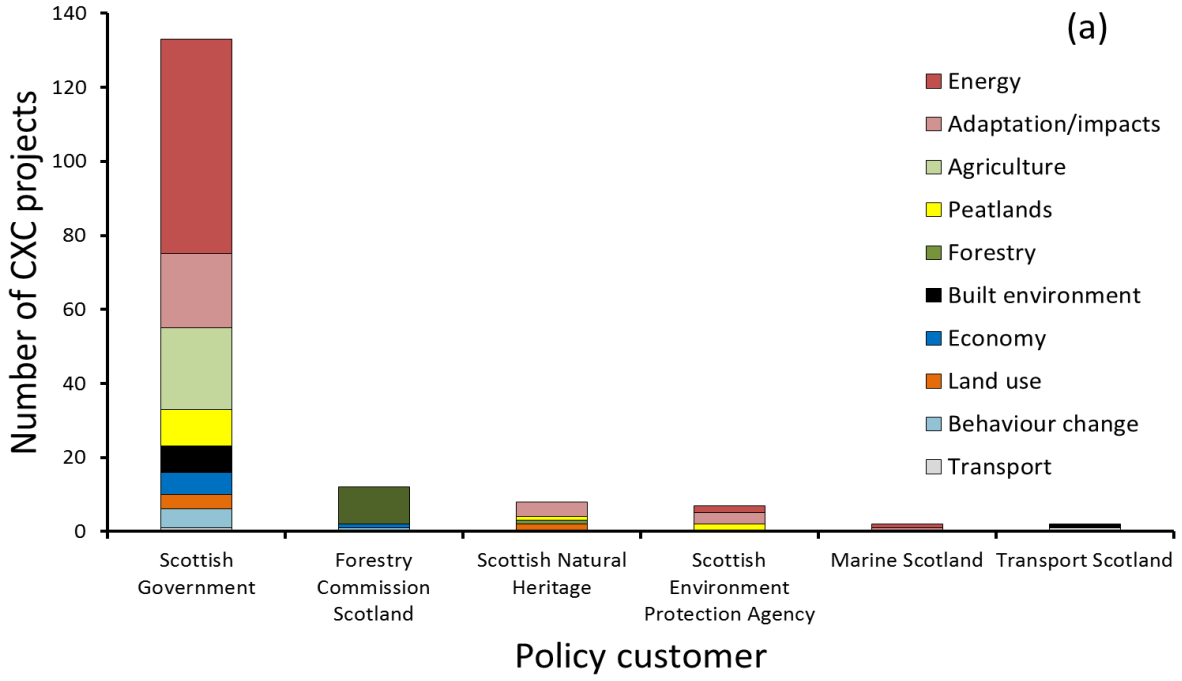

Fig. A5: Number CXC projects by policy customer and topic (a). CXC undertook 164 projects over the period 2011-2016, of which 133 were for 7 Directorates within Scottish Government (b). Directorates were: Energy and Climate Change (DECC), Environment and Forestry (ENFOR), Agriculture, Food and Rural Communities (AFRC), Housing and Social Justice (DHSJ), Chief Economist (DECON), Local Government and Communities (DLGC), Culture, Tourism and Major Events (DCTME). NS = not specified.

Annex B

The Scottish Government's Centres of Expertise: Amplifying Value and Accelerating Impact

The core elements of the Centres' collective value, purpose and impact are set out below. These represent a clear set of messages about the unique value of the Centre of Expertise model.

1. Providing policy-ready advice and evidence

This is the core purpose of the Centres of Expertise – to bring forward evidence, insights and knowledge targeted at specific policy questions. The Centres are demand-led, with all activities directed at addressing user needs. They work proactively and reactively with policy makers to provide timely, independent, robust and accessible research directed at addressing specific policy challenges.

2. Improving the scope, scale and efficiency of access to research by the user community

The Centre of Expertise model provides a single point of access for a time-poor policy and wider stakeholder user community, vastly improving the experience of research users in accessing knowledge from a wide research base. The Centres act as coordination hubs for independent expertise, generating coherent, comprehensible and trusted outputs. This increased efficiency in turn improves the likelihood that insights from research are actually used in decision making.

3. Leveraging access to and influence on, wider research for policy impact

The Centres have a 'gravitational pull' in their fields that draws in wider academic interest and thus knowledge and expertise. Their coordination function allows them to reach out to research networks funded by others, providing a route to impact for those networks while leveraging their knowledge for the Centres' core policy and practice users.

4. Creating new partnerships between Research Institutes and Universities

A key component of the Scottish Government's rationale in founding the Centre of Expertise model was a desire to see Scotland's research institutes and universities working more closely together in areas where they have complementary expertise. This is an enduring feature and strength of the Centres, creating partnerships and building capacity between institutions by promoting resource- and data-sharing. Such effective and efficient relationships are critical at a time when research budgets are constrained and/or are becoming more directed to demonstrating impact on societal grand challenges.

5. Increasing collective research capacity - a strategic platform for new and more efficient collaboration

The convening power of the Centres and the links they now have to wider research networks have generated a capacity and capability in research communities that did not exist before. These provide a platform for deeper sharing and exploitation of

ideas, across academic disciplines and institutions in Scotland and more widely, as well as a mechanism to share strategic resources such as data. Investment in the Centres builds and sustains strategic capacity in human and intellectual capital, developing research capability to be more robust against future challenges.

6. **Mobilising and influencing extensive scientific capacity to respond to societal priorities**

The Centres have developed strong links to policy, business and practice in their respective sectors. These links, and the nuanced sectoral intelligence now held by the Centres, provide an avenue for the mobilisation of significant new research communities, allowing them to better address emergent societal needs. As well as being of critical value to 'problem holders', this mobilisation is of value to research funders seeking to align research capacity with challenge agendas: the Centres provide lessons and generate capacity to enable a tighter coupling of research capability and societal priorities.

7. **Generating new cross-sectoral knowledge driven by real-world needs**

The Centres use their research bases and wider networks to generate new data, evidence, and knowledge as well as building on existing research through synthesis and interpretation. Because of the problem-driven approach of the Centres, this new knowledge is often inter-disciplinary. The Centre of Expertise model explicitly involves growing, and pump-priming where needed, the links between institutions, so that collaboration becomes integral to their work. Knowledge creation that is driven by a need to respond to real-world demands promotes inclusive cross-sectoral intelligence in a way that is complementary to that achievable through a more 'supply-driven' model.

8. **Tailoring approaches to user needs**

Flexibility is integral to the Centre of Expertise model. Each Centre is tailored to specific user communities' needs and is highly responsive to the culture and organisational landscape of its stakeholders. The Centres are living, evolving entities, with learning actively shared between them.

9. **Exemplifying world-leading approaches to science-policy knowledge exchange**

The cross-institution networks generated by the Centres provide an exemplar to the rest of the world about the ways in which inclusive, interdisciplinary collaborations can yield enhanced support for policy at the same time as enhancing research impact. This showcasing benefit is important for building the reputation and reach of Scotland's research capacity. It also strengthens the 'pull factor' for academics not directly funded by the Centres to collaborate and provide in-kind input to Centre projects.

10. **Improving policy processes and outcomes**

Ultimately, the Centres are about improving policy outcomes through the integration of more targeted, timely and usable evidence into the policy making process.

Through painstaking knowledge exchange, including deliberate co-construction of projects, the three existing Centres have built recognition and trust with their stakeholder communities. This process takes time and involves culture change in both the academic and user communities. As is now understood for all knowledge exchange work, real-world outcomes can take years to emerge. Nevertheless, the Centres have already demonstrated that their research and insights have had a significant impact in the policy process, generating ideas that have been taken up in policy, programmes and regulation. It is this unique role that allows the Centres to support improved policy outcomes for Scotland’s people, environment and economy.