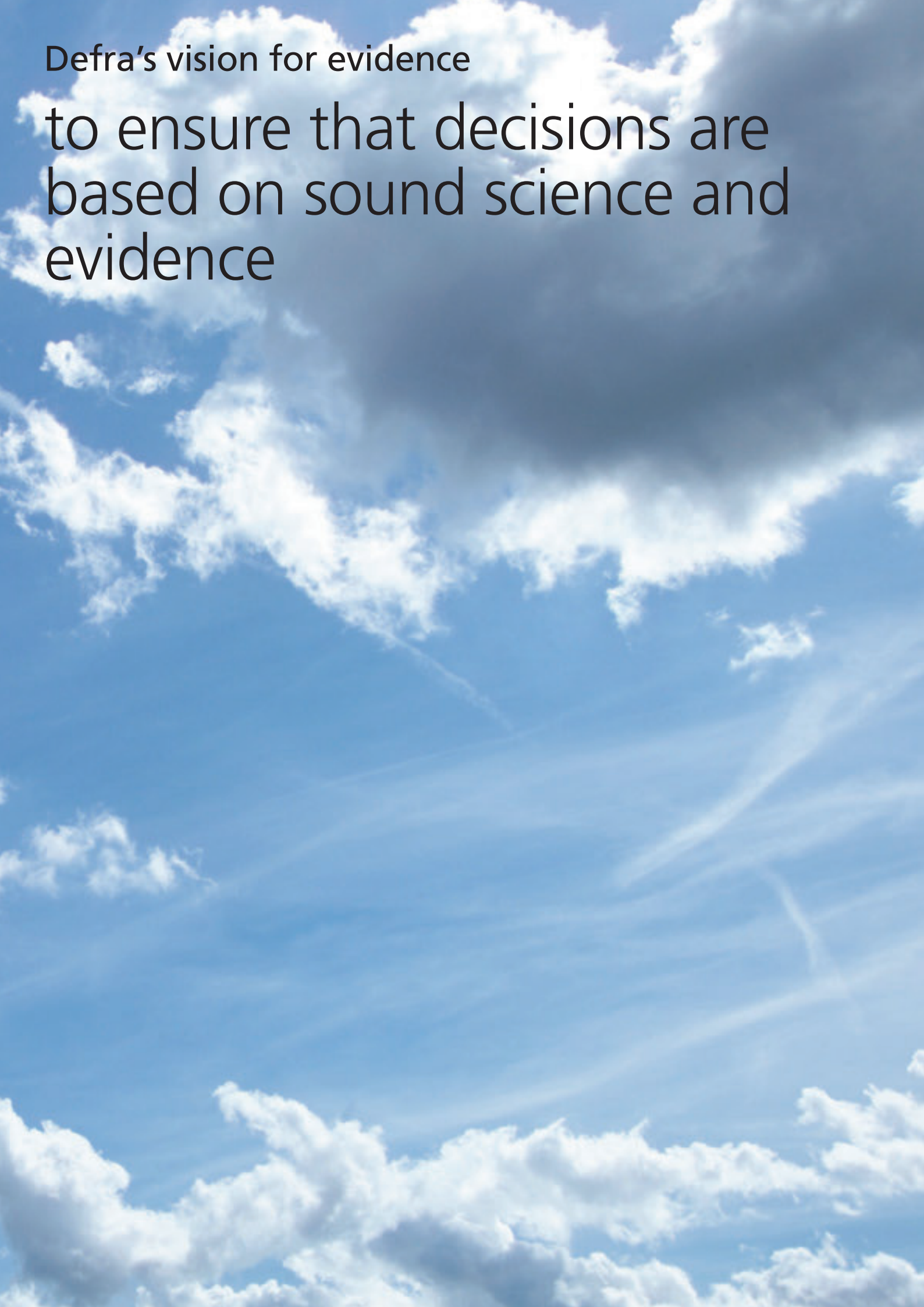
Defra's Evidence Investment Strategy: 2010-2013 and beyond

2011 update

defra
Department for Environment
Food and Rural Affairs

Defra's vision for evidence

to ensure that decisions are based on sound science and evidence



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Foreword from the Secretary of State

I am delighted to have the opportunity of presenting Defra's updated Evidence Investment Strategy. This strategy update reaffirms the Department's commitment to evidence-based decision-making and will help us to obtain focused, high-quality evidence to deliver a better environment for all in the future.

The Coalition Government places great emphasis on making informed policy decisions based on the best possible advice. Indeed the importance of independent scientific advice has been recognised in the new Ministerial Code, which requires Ministers to follow the 'Principles of Scientific Advice to Government' and the UK Statistics Authority's 'Code of Practice for Official Statistics'. These set out the rules of engagement between government and those who provide independent scientific and engineering advice.

Defra's Business Plan sets out ambitious policy objectives. These will be extremely challenging to achieve, particularly given the need for significant cuts to public spending. The need for robust, timely and accessible evidence of 'what works' and what offers best value for money is greater than ever. As always, the key is to ensure effective outcomes.

This Strategy sets out Defra's overall evidence investment for the period of the 2010 Spending Review. It is important that accurate and transparent information on public research expenditure is available, and to be able to track this spend over time. The Coalition Government recognises that the evidence budget needs a stable framework which allows the research community to plan strategically and gives confidence to the public, business and charities.

I have taken steps to ensure that I and my fellow Ministers receive regular reports on the progress of the Department's work on evidence. The Department's Chief Scientific Adviser will attend and provide regular reports to the Supervisory Board meetings, which I chair. This recognises the importance of the Department's science and evidence work.

Key messages from Defra's Chief Scientific Adviser

This strategy addresses the key evidence challenges facing the Department, summarises the evidence plans for policy programmes across the core Department, and makes important links with the wider Defra Network. I am pleased to be leading Defra's evidence work at this very important time.

The policy landscape has evolved and the challenges ahead will require us to make the best use of existing knowledge, and be flexible, efficient and creative in how we address persistent and new policy issues. We must make sure that the outcomes and impacts from our programmes of research, data collection and analysis are cutting edge where appropriate, and are effectively used in policy development.

Working with fewer resources will require all evidence specialists within the Department to work together to ensure that our policy development process is underpinned by the best evidence. We will monitor the effectiveness of this strategy and its actions over the course of the next four years, reviewing our objectives and the processes we have introduced to meet them.

We will need to be more innovative in the way we design and commission our evidence, how we use our resources and cascade that knowledge to support the development of more effective and efficient policy outcomes. To encourage greater innovation, we will be promoting the use of the latest methods and analytical techniques, strengthening interdisciplinary working among analysts and scientists – both within Defra and beyond in our evidence suppliers and funding partners. Through our governance arrangements our Heads of Professions will scrutinise the quality of our evidence base, and ensure its robustness to support the development and delivery of innovative policies.

An important part of my role is to ensure that the evidence we use is of sufficient quality and 'fit for purpose'. As well as using evidence from both the public and private sectors, we need to generate and use evidence from across the full range of scientific disciplines (e.g. natural science, social and operational research and statistics). We are looking to exploit better our analytical resources and skills to meet the many challenges that Defra faces.


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1. Introduction

1. Defra's *Evidence Investment Strategy: 2010-2013 and beyond* (known as Defra's 'EIS') was published in January 2010. The EIS set out Defra's plans and approaches to evidence[1] gathering in the context of increasingly complex and interlinked issues, in a world where public expenditure is under pressure and value for money increasingly scrutinised. It focused on the commissioning and use of all major sources of evidence by Defra programmes. The EIS examined Defra's links with its laboratory agencies, the delivery network and advisory bodies, together with key external partnerships (other Government epartments, devolved administrations[2] and Research Councils), and the capabilities (facilities, expertise) on which we depend. The Chief Scientific Adviser (CSA), as part of the EIS process, also led a detailed investigation into evidence gathering and use by policy programmes within Defra.

2. The EIS recognised there was more to be done on improving Defra's performance in gathering and using evidence effectively for policy making, and in evaluating the outcomes of this use of evidence. It also recognised the need to strengthen Defra's level of interaction with others so that benefits might be realised from joining up the evidence base, especially across the challenges of climate change, sustainable food supply and protecting ecosystem services. The strategy outlined five key strategic objectives:

   a) prioritise investments between programmes;

   b) sharpen our focus to deliver evidence and innovation;

   c) increase co-operation using partnership working to share the investments, knowledge and expertise;

   d) develop and organise the right skills, expertise and capabilities; and

   e) refine our processes.

3. The aim of this document is to re-visit Defra's EIS in light of the changing political landscape, Defra's Business Plan and the 2010 Spending Review. In doing so it highlights the progress made in implementing the EIS, and summarises the work that has been done on evidence programmes, indicative budgets and the big evidence challenges facing Defra and its network.

1 By 'evidence' we mean reliable and accurate information that Defra can use to inform sound decisions in developing and implementing policy. It includes economics, statistics, natural and veterinary scientific information, social research, operational research, engineering, analysis, advice, monitoring and surveillance.

2 The geographical coverage of Defra policy varies according to the terms of each of the devolution agreements with the administrations in Scotland, Wales and Northern Ireland. All Defra's evidence supports policy in England and Wales, with much also underpinning policy throughout the UK.

2. Key developments since the EIS

4. Since the inception of Defra's EIS, much has changed – not only within Defra, but also across government as a whole. The major developments are set out below.

2.1 Change of government, and impact on Defra's programme and priorities

5. There has been a change of government since the EIS was written, with the formation, in May 2010, of the first Coalition Government since World War II. The Coalition's stated priorities are to safeguard national security and tackle the national deficit; whilst reforming public services, supporting sustainable growth and enterprise, promoting green industry, developing social mobility, redistributing power to local communities, improving our quality of life and wellbeing, increasing transparency, and reducing bureaucracy.

6. The Coalition has committed to being the 'Greenest Government Ever' and has at its heart a shift from Big Government controlling actions and target setting to a Big Society identifying the most effective local action and taking responsibility for outcomes.

7. The scale of the fiscal deficit has necessitated sharp cuts in government spending, and the 2010 Spending Review, which set out budgets over the period up to 2014/15, has required decisions to be taken on where those cuts should be made. This applies to Defra's programme and priorities as much as to the rest of the public sector.

8. Defra's Business Plan sets out the Secretary of State's vision for the Department, describing Defra's priorities and the ways in which Defra will operate over the four years of the Spending Review period.

9. Defra's business plan priorities over this period are to:

   i. Support and develop British farming and encourage sustainable food production.

      - Help to enhance the competitiveness and resilience of the whole food chain, including farms and the fish industry, to help ensure a secure, environmentally sustainable and healthy supply of food with improved standards of animal welfare.

ii. Help to enhance the environment and biodiversity to improve quality of life.

- Enhance and protect the natural environment, including biodiversity and the marine environment, by reducing pollution, mitigating greenhouse gas emissions, and preventing habitat loss and degradation.

iii. Support a strong and sustainable green economy, resilient to climate change.

- Help to create the conditions in which businesses can innovate, invest and grow; encourage businesses, people and communities to manage and use natural resources sustainably and to reduce waste; work to ensure that the UK economy is resilient to climate change; and enhance rural communities.

10. In addition, the Business Plan identifies other major responsibilities:

iv. Prepare for and manage risk from animal and plant disease.

- Protect the environment, society and the economy from the risks of animal and plant disease through a range of controls, surveillance and horizon-scanning activities that help us understand the risks and maintain proportionate management responses.

v. Prepare for and manage risk from flood and other environmental emergencies.

- Maintain an effective, resilient and robust capability to respond to the full range of environmental emergencies, including by reducing the threat of flooding and coastal erosion by understanding and managing the risks.

11. Defra's Information Strategy (described in the Business Plan), sets out the steps the Department is taking to make data and information publicly available. It will include key indicators against which Defra will publish data to show the cost and impact of public services and its own activities. The Department will look to improve its multi-disciplinary approach to analysis, and stay in touch with the latest thinking and cutting edge research to identify forthcoming issues and prepare accordingly. This will help ensure a suitably robust evidence base.

12. Since December 2010, the Secretary of State has chaired a new Supervisory Board for the Department, which meets quarterly. Ministers along with the Permanent Secretary, Directors-General and the Department's Non-executive Directors monitor progress against the Business Plan, and performance against key efficiency metrics. The CSA attends these meetings, and provides regular reports (either to the meetings or on an ad hoc basis as required), thus providing a direct reporting line from Defra's evidence work to Ministers, and improving visibility of evidence work across the Department.

13. The developments described in the following sections add to the Department's existing evidence challenges and are addressed across the Department's Evidence Plans.

2.1.1 Green Economy programme

14. The Coalition Government priorities resulted in a realignment of Defra's objectives, with the most significant change being to ensure that the Department plans and manages the transition to a green economy. This is reflected in an extension of the 'Big Challenges' for evidence.

15. Defra's Business Plan commits to "Support a strong and sustainable green economy, resilient to climate change". A green economy *is where value and growth are maximised across the whole economy while managing natural assets sustainably. The green economy will be supported and enabled by a thriving low carbon and environmental goods and services sector. Environmental damage will be reduced, while increasing energy security, resource efficiency and resilience to climate change.*

16. In a green economy businesses will demand sustainable inputs and produce sustainable products. They will be profitable and grow over the long term. Government will create the right policy frameworks. Citizens and communities will intensify their contributions to a green economy both individually and as part of a Big Society.

17. In moving towards a green economy Defra will support jobs creation and growth whilst also ensuring that policy decisions are made on the basis of full consideration of all factors. Investment in robust evidence and timely innovation is a significant part of government's role in supporting the transition to a green economy. Evidence is needed to inform, support and direct policy design, to scrutinise performance and to identify longer term issues.

Case Study: Working alongside fishermen

Previous attempts to reduce the damaging fishing practice called "discarding" (throwing fish with no market value back into the sea) often achieved little or no success. Project 50% used an innovative approach to tackle this high-profile, long-standing issue by putting collaboration at the heart of its plans.

Funded by Defra and coordinated by the Centre for Environment, Fisheries and Aquaculture Science (CEFAS), Project 50% used social research skills to understand the reasons behind resistance to adopting modified fishing nets. Interviews were conducted with fishermen in South-West England to clarify the issues, communicate the potential for change, and help guide a new approach to developing discard-reduction techniques.

Devon beam-trawler crews agreed to try to reduce their discards by an ambitious 50%. Working with local net-makers, the fishermen trialled their own new net designs alongside standard trawling configurations. The research was supported by Cefas gear technologists and fishery liaison officers.

The side-by-side trials were a resounding success, with average discard reductions of 56% and the most successful boat achieving a 77% reduction. Fewer discards, fuel savings and more marketable fish that commanded a higher price in port all convinced the fishermen that changing practices and working with natural and social scientists could deliver better outcomes.

2.1.2 Defra's work on Big Society

18. In addition to establishing a green economy, Big Society is driving Defra's (and government's) policy approach to ensure government is undertaking only the actions that cannot be taken on by others, and working in partnership and in support of others who are best placed to deliver change.

19. Big Society has three aims which lie at the heart of the Coalition's reforms: stimulate social action; community empowerment; and service reform. Defra committed in its Business Plan to support the building of the Big Society to enhance the countryside, habitats and the urban environment.

20. Defra's broad remit means it is well placed to work in partnership with others in building the Big Society, for example by removing barriers which stifle local action, wherever appropriate, and by bringing decision making closer to communities and individuals.

21. Many teams within Defra and the delivery network are already taking a Big Society approach, and the lessons learned from these projects can help to further develop the Department's understanding. These reflections will provide a valuable part of the evidence base on Big Society and a set of case studies has already been built up which can be drawn upon to make Big Society accessible and tangible. However, it is clearly necessary to move beyond case studies to understand how Big Society is progressing and where it is not, why it is not.

22. The Big Society represents a major challenge to the way public services are developed and delivered. Achieving the three main aims of Big Society requires a better understanding of the capabilities of society (including households, community groups and businesses of all models and sizes) to take on these new responsibilities; as well as a more facilitative, enabling role for government, and identification and development of novel and innovative approaches to social action. A further challenge is identifying the evidence that will help build and support the Big Society and whether the information held at present can be used at the community scale.

Case Study: Big Society

Involving the public in environmental monitoring activities is an effective way of increasing understanding of issues and commitment from the public. Defra and its arm's length bodies support a number of monitoring schemes run by the Centre for Ecology and Hydrology which have been designed to optimise the resources of the volunteer community.

Some activities tap into the enthusiasm of existing interest groups which enables experts in such teams as the Biological Records Centre to collate the records derived from an estimated 75,000 hours of wildlife recording time.

Other activities recruit volunteers for specific monitoring schemes. These range from a network of 50 volunteers who provide information to the Isle of May monitoring team, who use European Shags as a measure of environmental variability, to UK Eutrophying and Acidifying Atmospheric Pollutants Network volunteers, who collect samples at the majority of the 100 sites in the network as a measure of the consequence of nitrogen deposition in the environment.

Such evidence can inform and validate policies to enhance and protect the environment and ensure society is directly involved.

2.1.3 Social impacts and wellbeing

23. One of the aims of the Coalition Government in the area of Environment, Food and Rural Affairs is to improve quality of life and wellbeing. As a result, a new cross-government analytical group (jointly chaired by Defra's Chief Economist) – the Social Impacts Taskforce – was set up to assess the relationships amongst the social impacts of policies, their effects on the UK's underlying stocks of produced, human, social and natural capital, and the implications this has for wellbeing.

24. The Task Force draws on analytical expertise from across UK Government Departments and leading researchers from outside government, and has developed *A Framework for Understanding the Social Impacts of Policy and their Effects on Wellbeing*[3]. The framework develops the approach in the HM Treasury Green Book and helps officials to take social impacts, which influence wellbeing, into account in the advice given to Ministers across government. Defra has adopted a 'capitals approach' in the framework to assess sustainability in terms of whether the stock of assets passed on to future generations is better or worse than what is available today, which is an important analytical component of mainstreaming sustainable development. This helps to strengthen the social impacts side

3 http://www.defra.gov.uk/publications/files/pb13467-social-impacts-wellbeing-110403.pdf

of the sustainability agenda across government, bringing the treatment of social impacts in policy development more into line with the approach taken on valuing the environment. It also helps to underpin the Prime Minister's agenda on wellbeing, and complements the aggregate measures of wellbeing being developed by the National Statistician, by providing a link to policy development.

25. Parts of this framework are already well quantified – particularly impacts which work through the market, for which prices are observable. There are also established methods for understanding and sometimes valuing social and environmental impacts outside the market. The Taskforce's work is focusing on gaps in knowledge and ways of making existing evidence easier to use. It will identify priorities for addressing these gaps, and for improving the consistency with which social impacts are assessed across government, in order to improve the quality of policy development and advice given to decision-makers.

Case Study: Developing the evidence base on understanding and influencing behaviour to encourage sustainable living

Defra is taking an innovative approach to encouraging sustainable lifestyles, which combines ground-breaking research and the development of best practice to influence behaviour. Defra is committed to supporting the development and enhancement of the evidence base on understanding and influencing behaviour to help ensure policies and approaches are effective. The evidence base is being developed through a number of key strands of work – a social research programme focused on understanding behaviour and the motivations and barriers to influencing behaviour; a small scale innovative programme of Action Based Research; and through the establishment of two Sustainable Behaviours Research Groups.

Building effective approaches to support people to live sustainable lifestyles requires developing innovative solutions, however not all behavioural interventions are tried and tested. Through the programme of Action Based Research, Defra is testing innovative techniques (based on theoretical insights) to identify what works, what does not work, and why. These small-scale projects provide an important stepping stone to developing a case for or against wider scale-up or rollout. Six small projects have been commissioned since 2009.

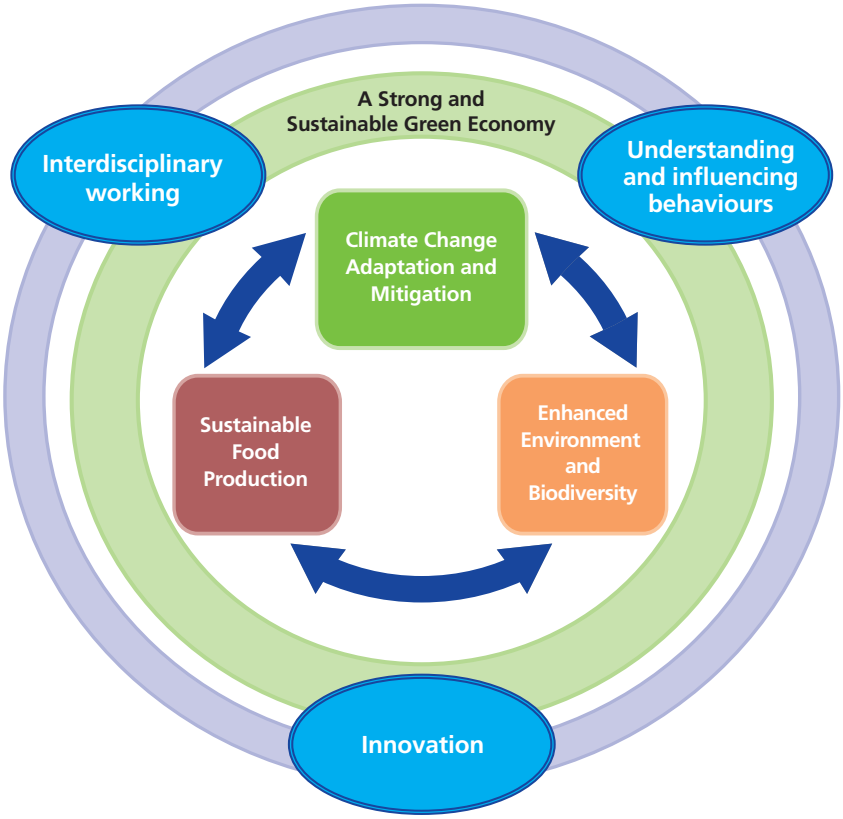
Over the next few years the evidence base will be significantly enhanced through the work of the Sustainable Behaviours Research Groups. Defra, the Economic and Social Research Council and the Scottish Government have established two Research Groups to explore a range of aspects relating to sustainable living. The Research Groups focus on complementary elements of sustainable behaviours:

- Sustainable Lifestyles Research Group, led by the University of Surrey, is developing an inter-disciplinary understanding of the complex relationships between people's lifestyles and practices, technological systems, and sustainability.
- Sustainable Practices Research Group, led by the University of Manchester, is exploring practices in society by focusing on routines and habits, and the circumstances which constrain and facilitate sustainable ways of life.

2.2 Defra's evidence priorities

26. Although there have been changes in government and policy priorities, the fundamental ethos of "evidence-based policy" is unchanged and, at a high level, Defra's long-term evidence priorities have not significantly altered. Defra remains committed to the use of high quality evidence, using an interdisciplinary approach (in terms of drawing together expertise from across scientific disciplines, policy areas and partner organisations) and excellence in the management and communication of evidence. The three big evidence challenges identified in the EIS are still relevant, but with a greater emphasis on green economy and sustainable food production (as opposed to supply). The diagram illustrating the big evidence challenges has been updated and is shown in Figure 1.

Figure 1: Defra's big evidence challenges

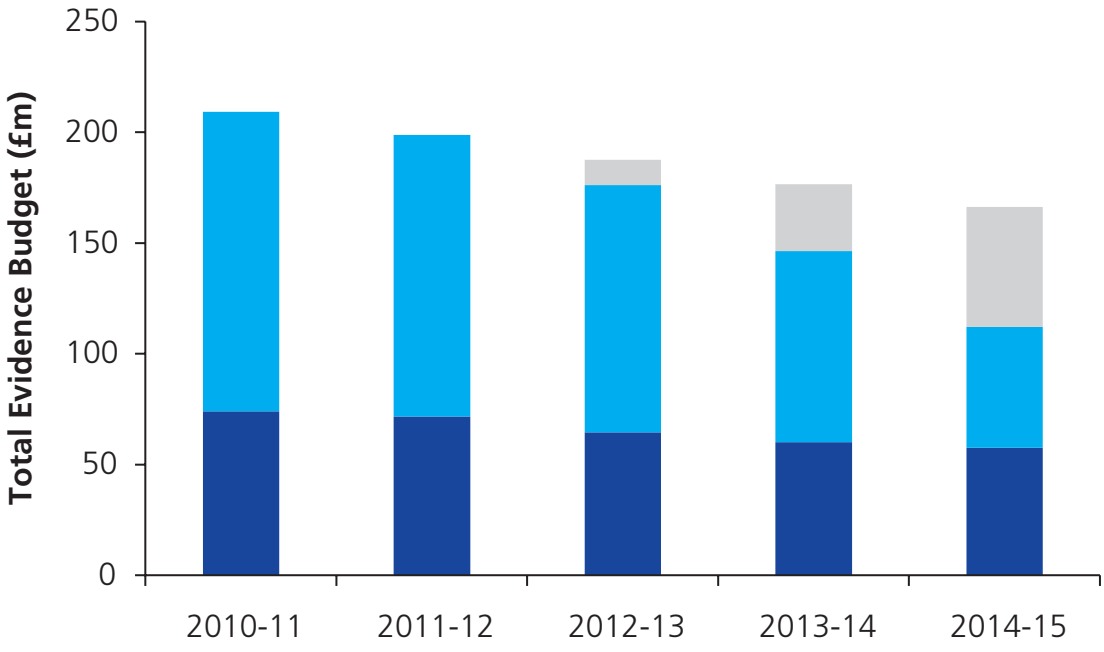


2.3 Defra's investment in evidence

27. The Spending Review set out how the Coalition Government will carry out the deficit reduction plan, reducing public spending by £81 billion[4] by 2014/15. On 20 October 2010, the Treasury announced that over the course of the Spending Review period (2010/11 – 2014/15), Defra's budget will be reduced by 30% in real terms (approximately 20% in cash). This will be achieved by reducing, in real terms, resource ('programme') spending by 29%, capital spending by 34% and the administration budget by 33%.

28. Savings from the evidence base are required, but these have been limited so that they are in line with reductions in overall programme budget. Thus core Defra is committed to a total of £43m evidence savings from programme budgets by 2014/15 (see Figure 2). This is from an evidence baseline for 2010/11 of approximately £210m. Core Defra's evidence budgets have been categorised as either "non-discretionary evidence", which includes statutory monitoring and animal health and welfare

Figure 2: Expected core Defra total evidence budgets[5] (composed of the non-discretionary[6] evidence budget (dark blue), discretionary evidence budget (blue) and the unallocated evidence reserve (grey)) for 2010/11 and over each year of the spending review. All figures are in £m.



4 http://cdn.hm-treasury.gov.uk/sr2010_completereport.pdf

5 This includes evidence commissioned by Defra at its laboratory agencies, but excludes Grant in Aid funding to delivery agencies such as the Environment Agency, Natural England and Kew, etc. Some Animal Health and Welfare surveillance evidence budgets for 2011/12 onwards have been transferred to the devolved administrations, but these have not been removed from the totals provided.

6 Non-discretionary evidence budgets are mainly formed of statutory monitoring, and animal health and welfare surveillance; whilst discretionary evidence budgets are other evidence activities such as R&D and other non-statutory monitoring

surveillance, or "discretionary evidence" which is made up of other evidence activities (such as R&D and non-statutory monitoring). Sufficient flexibility to respond to future evidence challenges has been achieved by reserving a proportion of the evidence budget (the "unallocated evidence reserve") in the final three years of the Spending Review period. This budget will be allocated each year. Smaller budgets mean it is ever more vital to make the very best use of existing evidence and maximise partnership and co-funding opportunities, both within Defra and with external partners, where new evidence is essential.

2.4 Review of expert scientific advice for policy making

29. Organisations across the Defra network have a vital role to play in helping generate Defra's evidence base. Like all other Departments, however, Defra has been reforming its network of arm's length bodies (ALBs) to increase accountability, improve efficiency and reduce their number and cost.

30. The intention is to simplify the ALB landscape, both for the Department and its customers, and increase transparency and accountability, whilst being guided by the strategic objectives set out in Defra's Business Plan. This includes restructuring the provision of scientific advice. Whilst recognising the excellent work done by its science and technical advisory bodies, the Department has reviewed the role and functions of those bodies to determine the scope for rationalisation where it is relevant and appropriate to do so. Eighteen science advisory Non-Departmental Public Bodies (NDPBs) were covered by the ALB review. Of those eighteen, three are being retained, and ten are being converted to Departmental expert committees, with new arrangements being made for improved coordination with the CSA and the re-constituted Science Advisory Council (SAC). Defra's SAC will continue to support the CSA in oversight of Defra's scientific committees; and will continue to provide independent advice and challenge to the CSA on the evidence underpinning a range of Defra policies. This will improve transparency and accountability, provide for stronger coordination, whilst allowing Defra to have continued access to independent, authoritative and cost-effective advice to support its policies.

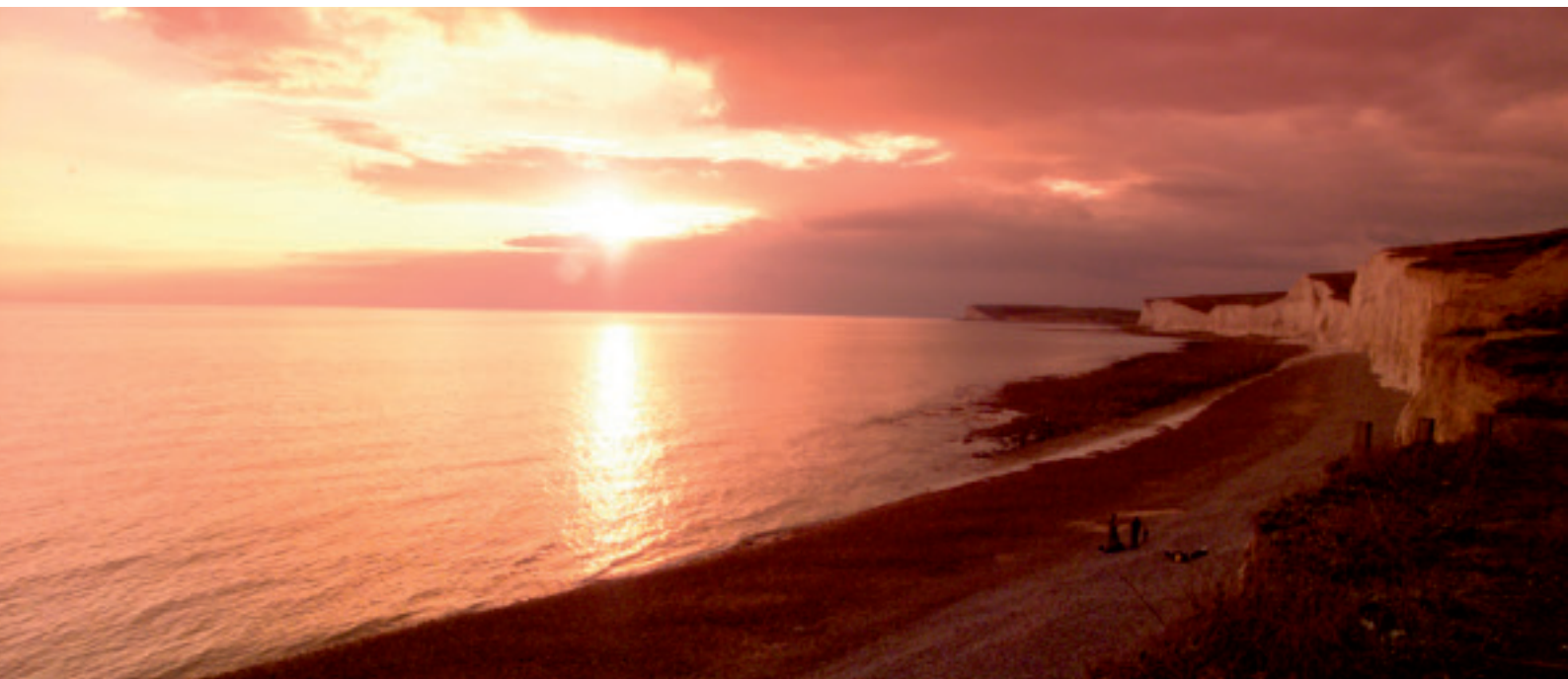
31. Defra has been working closely with its two largest environmental ALBs – the Environment Agency and Natural England – to implement a comprehensive package of measures which will transform them into leaner, more efficient front line delivery bodies focused strongly on the Government's ambitions for the environment and a green economy.

32. Animal Health and the Veterinary Laboratories Agency (AHVLA) were merged on 1st April 2011, which means that services, expertise and scientific capability around animal health are brought into one agency. This will improve resilience in delivery of important services including the emergency response capability for animal disease and science requirements for animal health. It will also lead to more efficient ways of working, which will have an end benefit for Defra's customers.

Case Study: Characterisation of pandemic H1N1 influenza and threats to veterinary health

Upon the emergence of the pandemic H1N1 virus (known as 'Swine Flu') in the human population, immediate questions were raised as to the threat to veterinary health. AHVLA conducted urgent research using its established animal models to study infection course and outcome in both pigs and turkeys.

It was very rapidly established that pigs were highly susceptible to infection with this virus and could readily transmit the virus to in-contact pigs. Poultry, however, were shown to be largely resistant to infection, but in certain circumstances infection could be established. However, it was definitively shown and proven that there was no food safety risk and no significant threat to human health, thereby underpinning advice offered by the Food Standards Agency and supporting government advice of minimal risk to human health from the animal sector. The information gathered was used to inform surveillance strategy in the veterinary sector in the UK, and the EU as a whole.



3. Review of progress against the EIS objectives

33. Significant progress against the EIS objectives has been made, but the Department is not complacent. Highlights of advances against the high level objectives are set out below.

3.1 EIS Objective 2.1: Prioritise investments between programmes

34. In order to meet the savings required for the 2010 Spending Review, a total of £43m evidence savings will be made from core Defra programme budgets by 2014/15. The Secretary of State requested that the CSA oversee the reduction in evidence budget. Evidence savings have been strategically managed across the Department according to evidence priorities so that larger savings will be found in areas for which the evidence need is lower (for example, because the evidence base is more mature) and smaller cuts will be made in the higher priority areas. Evidence priority areas were identified from the Evidence Investment Strategy, Coalition Government's priorities, Defra's Business Plan, and through consultation with Welsh Assembly colleagues. Evidence budgets for 2010/11 in comparison to 2011/12 budgets by theme are provided in Table 1 and evidence budgets for 2011/12 by Evidence Plan area[7] are provided in Table 2.

Table 1: Evidence budgets[8] for 2010/11 and 2011/12 for comparison by Defra Group (figures exclude capital spend and Core Defra staff costs)

Group	Total evidence budget for 2010-11 (£m)	Total evidence budget for 2011-12 (£m)	% decrease (cash terms)
Animal Health and Welfare (AHW)	67.8	63.2	7%
Food and Farming (FFG)	43.3	42.3	2%
Environment and Rural (ERG)	85.3	81.3	5%
Green Economy and Corporate Services (GECS)	13.0	12.0	7%
Total	**209.3**	**198.9**	**5%**

7 The Evidence Plan reflects the total investment in evidence supporting a particular policy programme, but does not necessarily align with the budgets associated with that programme on the Defra finance system. See annex 2 for more information about evidence plans.

8 This includes evidence commissioned by Defra at its laboratory agencies, but excludes Grant in Aid funding to delivery agencies such as the Environment Agency, Natural England and Kew, etc. Some Animal Health and Welfare surveillance evidence budgets for 2011/12 have been transferred to the devolved administrations, but these have not been removed from the totals provided.

Table 2: Evidence programme budgets (£m) for 2010/11 and 2011/12 for each Evidence Plan area[9].

Evidence Plan Name	Group	Total evidence budget 2010/11	Total evidence budget 2011/12	% change in total evidence from 2010/11 to 2011/12
Animal Welfare	AHW	2.74	2.43	-11%
Aquatic Animal Health	AHW	2.11	1.95	-7%
Bovine TB	AHW	12.60	12.41	-2%
Disease Mitigation and Control	AHW	6.98	5.93	-15%
Endemic diseases✤	AHW	9.50	8.97	-6%
Exotic Diseases	AHW	13.34	12.60	-6%
TSEs✤	AHW	17.60	16.26	-8%
Veterinary Medicine and Anti-Microbial Resistance	AHW	2.88	2.61	-9%
CCMAFC✤	FFG	8.95	9.24	3%
Crops	FFG	7.71	7.28	-6%
EUABS✤	FFG	1.40	1.27	-9%
Farming Elements✤✤	FFG	9.10	8.76	-4%
Livestock	FFG	3.62	3.42	-6%
PHBHPVS✤	FFG	9.20	9.24	0%
SSHFS✤	FFG	3.29	3.11	-6%
Adapting to Climate Change	ERG	7.55	7.80	3%
ALE minus noise✤	ERG	12.22	12.11	-1%
Better Regulation	ERG	0.25	0.20	-20%
Biodiversity	ERG	3.86	3.99	3%
Chemicals & Nanotechnologies	ERG	2.65	2.41	-9%
Floods	ERG	2.09	1.97	-6%
Inland Waterways, Landscape and Outdoor Recreation	ERG	0.18	0.18	0%
Marine	ERG	31.87	30.09	-6%
Natural Value	ERG	1.13	1.11	-2%
Noise✤✤✤	ERG	3.51	3.24	-8%
Pesticides	ERG	5.00	4.62	-8%
Rural Communities	ERG	2.27	2.10	-7%

9 The Evidence Plan reflects the total investment in evidence supporting a particular policy programme, but does not necessarily align with the budgets associated with that programme on the Defra finance system, See annex 2 for more information about evidence plans. Some Animal Health and Welfare surveillance evidence budgets for 2011/12 have been transferred to the devolved administrations, but these have not been removed from the totals provided.

Rural Development Programme for England	ERG	3.00	2.85	-5%
Soil Protection	ERG	1.72	1.69	-2%
Waste and Resources	ERG	3.84	2.87	-25%
Water Availability and Quality and Drinking Water Inspectorate	ERG	4.16	4.10	-2%
Sustainable Consumption and Production	GECS	6.35	5.47	-14%
Sustainable Development	GECS	0.27	0.27	0%
Strategic Evidence	GECS	6.40	6.31	-1%
Total		**209.31**	**198.86**	**-5%**

✤ Abbreviations are as follows: Endemic Diseases is New and Re-emerging Diseases, Endemic Diseases and Enhanced Surveillance Methodology; TSEs is Transmissible Spongiform Encephalopathies and Animal By-Products; CCMAFC is Climate Change Mitigation for Agriculture and the Food Chain; EUABS is EU Agriculture and Budget Strategy; PHBHPVS is Plant Health, Bee Health, Plant Varieties and Seeds; SSHFS is Sustainable, Secure and Healthy Food Supply and ALE is Atmosphere and Local Environment

✤✤ Farming Elements contains GM Policy and Regulation

✤✤✤ Noise is part of the Atmosphere and Local Environment Evidence Plan

35. An unallocated evidence reserve has been established to provide flexibility to respond to future evidence needs and emerging issues across England and Wales, such as those which may be identified in the White Papers on the Natural Environment and on Water, for example, or from the UK Climate Change Risk Assessment. This reserve is for the final three years of the Spending Review period. As a percentage of the total discretionary evidence spend for those years, the reserve is 10% in 2012-13, 25% in 2013-14 and 50% in 2014-15.

36. At the same time the Department has to meet a number of less flexible statutory monitoring and animal health surveillance requirements. Budgets for these requirements (referred to as "non-discretionary evidence budgets") have not contributed to the unallocated evidence reserve. However, in order to meet the total evidence savings needed, these budgets are being reduced by 5% year on year unless local policy areas have indicated greater savings. It is anticipated that these savings will be achievable through efficiencies. Where this is not possible, funds from the unallocated evidence reserve will be made available.

37. Smaller budgets mean it is vital to make the very best use of existing evidence and maximise partnership and co-funding opportunities where new evidence is essential. As part of the planning process for establishing budgets for the Spending Review period, the CSA consulted the Senior Responsible Owners (SROs) of policy programmes on their intended evidence investment. The CSA will continue to work with SROs and evidence teams as part of annual business planning to review evidence

needs and priorities in order to distribute the unallocated evidence reserve. This will ensure that evidence investment is strategically managed across Defra's portfolio. Approval must be sought from the CSA before significant changes to evidence budgets can be made.

38. Achieving value for money from evidence investment is key, and regular reviews of the evidence base are now carried out in local policy areas to ensure evidence delivers maximum impact (such as the review of marine monitoring activities published in the UK Marine Science Strategy[10], and the ongoing work on coordination and integration of programmes through the UK Marine Monitoring and Assessment Strategy). The Department has also built regular reviews of the evidence base into its policy and evidence cycles.

3.2 EIS Objective 2.2: Sharpen our focus to deliver evidence and innovation where we need it most – short and long term

39. The EIS committed Defra to improve its line of sight between evidence activities and policy goals. Since then, each of the 35 business areas commissioning evidence has produced an Evidence Plan[11] which outlines:

- the policy context and alignment to Defra's objectives and big evidence challenges;
- an overview of current knowledge;
- the objectives of Defra's investment in new evidence;
- a prioritisation of evidence needs;
- access to expertise;
- opportunities for funding partnerships; and
- the overall approach to meeting evidence needs.

40. Evidence Plans have been signed off by Defra's CSA, and summaries of each of these Plans are in Annex 2. The full Evidence Plans are also available on the Defra website. It is intended to update individual Plans on an *ad hoc* basis as policy or evidence needs evolve.

41. These Evidence Plans have already been used to inform the prioritisation of investment (see section on EIS Objective 2.1). They will continue to inform the annual allocation process, but also have value as public statements of Defra's high level evidence needs and priorities. In addition, advice on the robustness of underpinning evidence now forms an integral part of management decisions on whether or not to start or continue new or existing initiatives.

10 http://www.defra.gov.uk/environment/marine/documents/science/mscc/mscc-strategy.pdf

11 The Evidence Plan reflects the total investment in evidence supporting a particular policy programme, but does not necessarily align with the budgets associated with that programme on the Defra finance system, See Annex 2 for more information about evidence plans

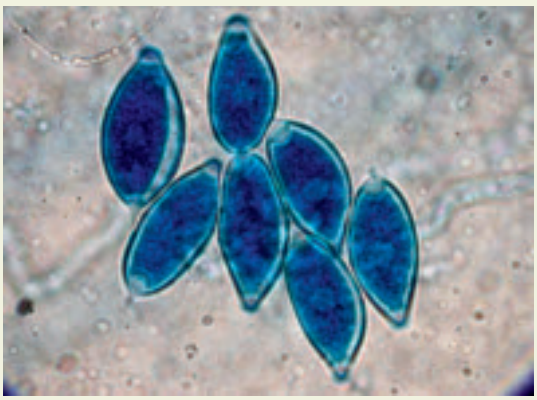
42. Defra is also taking steps to promote assurance to improve policy making: a new Policy Evaluation Project Board has been established to embed evaluation within Defra, to strengthen future policy design and decision-making, and to demonstrate how the Department is delivering value for money from its investments. Evidence will form a key component of this work.

43. The EIS highlighted the need for Defra to drive more innovation into policy and towards its outcomes. This is being addressed in part through the Strategic Evidence and Partnership Fund (SEPF), which is part of the Strategic Evidence budget. The terms of reference for the SEPF state:

'The EIS identified innovation as essential to meeting Defra's challenging goals and, in particular the need to get beyond relatively low-risk projects, and address higher-risk/higher-gain, transformative options. Given the financial climate, spreading the risk of innovation is important, and partnership programmes are an effective way of doing so, both providing a wider range of innovative thinking and sharing the risks with other funders. The SEPF aims to promote innovation, and for projects which fit the criteria, can offer an opportunity to explore innovative solutions and stimulate innovative approaches.'

44. Defra is also working towards the establishment of an 'innovation hub' to coordinate, harvest and share innovation in the Department. Throughout the Department innovative policy solutions are being created. The EIS team are developing a strategy to communicate these ideas across the network by providing a portal for accessing information and responding to enquiries.

Case Study: Plant Pathogens



Phytophthora kernoviae sporing structures (sporangia) (x 400)

The Defra funded Phytophthora Disease Management Programme, which began in 2009 and is led by the Food and Environment Research Agency (FERA), is benefitting from recent advances in DNA sequencing technology.

This is being used to explore the genomes of Phytophthora strains from the UK to explain the genetic basis for host preference and adaption to the environment in the pathogen.

The use of the technology will help to inform strategies to contain the disease, which has the potential to kill significant numbers of trees and heathland species, destroy Sites of Special Scientific Interest, and have an impact on local tourism and rural economies.

Case Study: Monitoring fish behaviour[12]

With many fish stocks declining, Defra prioritises research into monitoring fish behaviour, as well as changes in the marine environment and fishing activities.

Scientists at Cefas have developed an electronic tag that reveals the eating habits of fish, which will ultimately help with predictions about future fish stocks.

The tag involves a magnet installed in the jaw of a fish, with a sensor that reads the changes in the magnetic field as the fish opens and closes its mouth. Its high sensitivity means that the researchers can track when a fish is feeding, as well as its location.

They found the tag to be so successful at tracking fish activity in its trials that they now plan to use a full production version to monitor feeding in wild cod in the open seas.

They are also now trialling sensors to track where the fish are moving. The three axis accelerometer sensors, which can detect movement in any direction will be used to learn more about the habits of fish by studying how they move about and measuring their metabolic rate.

3.3 EIS Objective 2.3: Increase co-operation using partnership working to share the investments, knowledge and expertise

45. In order to respond effectively to Defra's evidence challenges, cohesive and collaborative working across policy programmes within Defra, across the Defra network, and with external partners is required. Progress has been made to improve sharing of information and partnership working to further develop a coherent evidence base.

3.3.1 Improved co-operation within Defra

46. Defra's Evidence Forum was re-launched in early 2010 to help develop a greater sense of community and promote sharing across programmes and specialisms. The Forum is a Department-wide 'community of practice' for evidence specialists. Members come together to share information, build knowledge, develop expertise, and solve problems. The Forum offers face-to-face events, workshops and seminars organised by and for members.

47. The CSA has hosted events to foster a culture of greater partnership working to respond to the big evidence challenges. For example the CSA hosted workshops on *Climate Change* and on *Ecosystem Services* in Summer 2010, and on *Sustainable Food Supply* in early 2011. These workshops discussed and prioritised Defra's evidence needs and gaps, and established how to collaborate and co-operate better both within the Department and with other organisations for each of the big evidence challenges.

12 Report available at http://randd.defra.gov.uk/Default.aspx?Menu=Menu&Module=More&Location=None&ProjectID=12654

48. In addition, several structural changes within Defra are being implemented to improve effectiveness and performance, such as combining the teams responsible for coordinating evidence at a corporate level.

3.3.2 Improved joint working across the Defra Network

49. In conjunction with the Defra network, the Department will be seeking greater coordination and co-operation on evidence issues, with a view to improving value for money, impact and effectiveness. Some specific activities are already underway (such as for environmental monitoring and data sharing – see Box 1). Closer working with the Defra network will also encourage a more proactive relationship between the ALBs and the core Department ensuring better alignment of capability and delivery with end use. The group set up to coordinate official statistics across the Defra network has demonstrated the value of joint working. As well as closer working with Defra Network partners, the formation of scientific expert committees means that the CSA (supported by the Science Advisory Council) now has a strengthened

Box 1: Defra's Data Sharing Programme and the promotion and sharing of existing data sources

The release of the SPIRIT toolkits, which are web-based mapping applications, has opened up the use of geographic information (GI) data sources to a wider base within the Defra network – future publicity activities on this are in preparation. Additionally, the release of a service which provides access to Rural Payments Agency data has increased the flow of information for analysts across the Defra network.

oversight role of all the Department's scientific advice. The Government's Chief Scientific Adviser guidelines are targeted at Government Departments; and whilst there is no explicit application to NDPBs, they provide a codified set of good practice for the Department's ALBs.

50. The delivery of horizon scanning and futures research is changing and will be provided across Defra and its arm's length bodies through a Centre of Excellence for Environmental Risks and Futures.

Case Study: Flood Forecasting Centre

The Environment Agency has been working with the Centre for Ecology and Hydrology (CEH) to develop the Grid-to-Grid model. This translates rainfall into river flows to enable the prediction of potential river flooding, which are used in the river flow forecasts issued by the Flood Forecasting Centre.

Incorporating the Grid-to-Grid model will improve and extend this capability at a national level up to 5 days ahead. If increased lead times reduced the annual costs of river flooding by 5%, this would equate to a cost saving of around £24 million per annum. The Grid-to-Grid Model can also be used to forecast how peak river flows may change in different parts of the country due to climate change and provide evidence for investment decisions for river flood defences. If, through this, a 1% efficiency saving in the flood defence investment programme relating to river flooding can be made over the next 25 years, the cost savings are estimated to have a Net Present Value of approximately £19 million.

Case Study: Defra's Multi-Agency Geographical Information for the Countryside (MAGIC)

Defra's MAGIC service provides a shared and accessible resource of information on the natural environment.

There are now over 170 environmental datasets freely available to the general public through an online interactive map. MAGIC directly supports a number of current government priorities including the Transparency agenda by making public sector data freely available; Big Society and localism by ensuring that the data that citizens, local communities and non-governmental organisations want is readily accessible; and the ALB Review by delivering the benefits of working in collaboration.

Natural England is now working with Defra and the MAGIC partners to consider how the service can be developed to meet the aspirations of the forthcoming Natural Environment White Paper to provide better access to more information to support greater citizen and community action and engagement with the natural environment.

3.3.3 Enhanced partnership working with key external stakeholders such as Research Councils and the European Union

51. Defra is working to strengthen its important links with external stakeholders, and maximise the value of the combined input. There are a number of important partnerships. These are detailed in the following sections.

Living With Environmental Change (LWEC)

52. Defra plays a leading role in the Living With Environmental Change (LWEC) partnership – an ambitious and innovative initiative involving 22 UK public sector research funding organisations, including a range of Government Departments and agencies, the devolved administrations, the Local Government Association, Research Councils and the Technology Strategy Board. The partnership already involves around 60 accredited activities with a value of over £600m.

53. Since the publication of the original EIS LWEC has merged with the Environment Research Funders Forum. This has combined the identification of the most pressing evidence challenges relating to environmental change, and their delivery through alignment of partners' efforts to meet those challenges and coordination of funding for leading multidisciplinary research and observation. The LWEC partnership has a growing international reputation and has a role in developing the UK's green economy with relevant skills, tools, knowledge and innovation. Some of the key LWEC programmes that Defra is involved in include:-

The UK National Ecosystem Assessment

54. The UK National Ecosystem Assessment (UK NEA) is the first analysis of the UK natural environment in terms of the benefits it provides to society and the nation's continuing prosperity. It is based on the processes that link human societies and their well-being with the environment and emphasises the role of ecosystems in providing services that bring improvements in well-being to people.

55. The UK NEA was carried out between mid-2009 and early 2011 as part of the LWEC Partnership. It was funded by Defra, the devolved administrations (Scotland, Wales and N. Ireland), Natural Environment Research Council (NERC) and the Economic and Social Research Council (ESRC). It involved over 500 natural scientists, economists, social scientists and other stakeholders from government, academic, non-governmental organisation and private sector institutions.

56. The UK NEA was designed to produce an independent and peer-reviewed assessment of the state and value of the UK's natural environment and ecosystem services, identifying and understanding what has driven the observed changes in the natural environment, the services it has provided over the last 60 years, and what may drive change in the future. It has fostered better interdisciplinary co-operation between natural and social scientists to assist in strengthening policy making, to ensure effective management of the environment and ecosystem services in the future.

57. The main focus of the UK NEA has been ecosystem services: supporting, provisioning, regulating, and cultural services. To reflect the extremely wide range of services provided by different ecosystems within the UK, ecosystem services have been analysed within the context of eight broad UK Habitat types: Mountains, Moorlands and Heaths; Semi-natural Grasslands; Enclosed Farmland; Woodlands; Freshwaters, Wetlands and Floodplains; Urban; Coastal Margins; and Marine.

58. The UK NEA developed an innovative approach to valuing ecosystem services to assess their contribution to human wellbeing. This takes into account the full range of marketable and non-marketable values of ecosystem service flows to individuals and collectively to society, and emphasises the importance of incorporating the inherent variability of the natural environment into economic analyses.

59. In examining the drivers of change, the UK NEA assessed how societal changes have influenced the demand for different services and the ability of ecosystems to deliver them, often by affecting the extent and quality of different habitats. Within this context, the UK NEA examined in detail the various response options available – mechanisms that can lead to changes in behaviour at individual, institutional and societal level that have a potentially positive impact on the delivery of ecosystem services over a range of timescales. Finally a series of scenarios was developed to assess what the future might hold, depending on the kinds of choices that are made now and in the immediate future as to how ecosystems are managed and the services they provide are used.

Risk Centre

60. Defra is a co-funder of the Risk Centre, along with three other research councils (Engineering and Physical Sciences Research Council (EPSRC), ESRC and NERC). This is a three-year strategic collaboration aimed at building environmental risk capability. Understanding and managing environmental risk is core to Defra's business, so improvements here should bring benefits to how risks are managed on behalf of the public and the environment, as well as within Defra. The Centre's team of research fellows work on case studies investigating, amongst other things:

    - strategic risk appraisal – developing a method to help Defra's senior managers compare different environmental risks better;
    - risk and evidence – developing government's revised guidelines for assessing and managing environment risk; and
    - organisational maturity – investigating how to improve the embedding of risk thinking in the Department and to network the risk expertise that exists in Defra's agencies.

Insect Pollinators Initiative

61. Defra is one of the partners of the Insect Pollinators Initiative (IPI) with the Biotechnology and Biological Sciences Research Council (BBSRC), NERC, the Scottish Government and the Wellcome Trust. The initiative's aim is to research the causes and consequences of threats to insect pollinators and to inform the development of appropriate mitigation strategies. Insects play crucial roles in the production of agricultural and horticultural crops, and in the maintenance of biodiversity in natural ecosystems. IPI is funding nine projects (totalling £9.6m, of which Defra's contribution is 25%) on subjects including honeybee nutrition and disease, effects of land use and urban environments on pollinators and sub-lethal effects of pesticides on bees. Coordinated partnership in this area is essential as the required research spans the scientific and policy remits of a number of funders, encompassing both climate change and food security priorities. The funders are working closely to ensure a continuing programme of knowledge exchange throughout the lifetime of the projects.

UK Ocean Acidification Research Programme

62. The UK Ocean Acidification Research Programme (UKOARP) aims to provide a greater understanding of the implications of ocean acidification (as a result of the absorption of anthropogenic carbon dioxide) and its risks to ocean biogeochemistry, biodiversity and the whole Earth system. It will:

    - feed into the cross-government Climate Change Adaptation programme;
    - provide evidence to the Intergovernmental Panel on Climate Change (IPCC) 5th Assessment Report on Climate Change; and

- provide information to marine bio-resource managers, policy makers and other stakeholders.

63. Defra's contribution to this programme is 30% of the £12.4m total, with co-funding from NERC and the Department of Energy and Climate Change (DECC). Six projects are being funded involving 21 UK scientific institutions to investigate the most pressing questions on the global issue of ocean acidification.

Report Cards

64. LWEC has provided a platform to develop report cards summarising the latest evidence and giving the latest consensus expert views on policy relevant issues. Building on the example set by the Marine Climate Change Impacts Partnerships (MCCIP) Annual Report Card[13] Defra is now working with several partners under LWEC to develop a Report Card for Climate Change Impacts. This will provide an annual account of developments in UK terrestrial and freshwater climate science. It will provide policy advisers, decision makers, Ministers, Parliament, the devolved administrations and other bodies with a single, concise, comprehensive, quality-assured, high level assimilation of knowledge of climate change impacts on the terrestrial environment.

65. In addition LWEC, through the Ocean Acidification programme (UKOARP), has been instrumental in developing a report card reflecting an international consensus on key questions on ocean acidification[14].

Global Food Security

66. Defra is a key partner in the Global Food Security (GFS) Programme[15]. The GFS programme brings together the interests of the major UK public funders of food-related research and training, including Government Departments, the devolved administrations, Research Councils and the Technology Strategy Board. The programme aims to help meet the challenge of providing the world's growing population with a sustainable and secure supply of safe, nutritious and affordable high quality food. That food will need to be produced and supplied from less land and with lower inputs, and in the context of global climate change, other environmental changes and declining resources.

67. The programme aims to provide evidence to enable food producers and processors, retailers, consumers and government to respond to and manage the challenges facing the UK food system and related global issues, including the many challenges confronting the developing world. The scope of the programme includes: food production and resource

13 See http://www.mccip.org.uk/annual-report-card/2010-2011.aspx

14 See http://www.oceanacidification.org.uk/pdf/OA.english.web.pdf

15 http://www.foodsecurity.ac.uk

management; food economics, markets and trade; food processing, manufacture and distribution systems; food safety and nutrition; consumption habits and practices; and waste in the food system. The programme will coordinate research supported by the programme partners and will build on the partners' existing activities, aiming to add value to their current and future investments, and complementing rather than replacing their individual strategies. It will bring additional coherence by acting as a focus for joint activities and helping to ensure alignment of individual activities with shared goals.

UK Food Research and Innovation Strategy

68. The 2010 cross-government UK Food Research and Innovation Strategy provides a coherent framework to support and enhance UK research and the basis for another key example of partnership working – the Food Research Partnership. Through this Defra is working with other Departments, the devolved administrations (especially the Welsh Assembly Government given the shared evidence budget), industry, and the research community to address the research skills, capacity and translation/ exploitation of research needed to meet the challenges of food security and climate change.

Sustainable Agriculture and Food Innovation Platform

69. The Sustainable Agriculture and Food Innovation Platform brings together government, business and researchers to stimulate the development of new technologies that will address industry and societal objectives for a strong, thriving and environmentally sustainable farming and food sector. The programme will see government investment of up to £90m over five years from the Technology Strategy Board, BBSRC and Defra, and will provide match-funding to industry in areas such as crop productivity, sustainable livestock production, waste reduction and management, and greenhouse gas reduction.

Bilateral agreements with Research Councils

70. Another example of close working with Research Councils is the development and implementation of an action plan with the NERC to identify ways of working more closely and efficiently in partnership. A concordat has been developed with the ESRC to foster better linkages between Defra and the ESRC; and several fellowships have been developed, with six fellows now working with Defra from NERC and ESRC. Officials are looking to gauge further future interest in this scheme.

EU and international collaboration

71. Global challenges also require collaboration at an EU and international level. Defra aims to ensure that EU funded research is relevant and that the UK can access finance under the 7th Research Framework Programme (FP7)[16]. Officials are also working with other Government Departments, the European Commission and EU Member States towards an effective European programme for research and innovation for the next EU Multiannual Financial Framework (2014/20). Better coordination of national research programmes across Europe is being achieved through mechanisms such as the ERA-Nets[17], EU Joint Programming Initiatives[18], and the EU's Standing Committee on Agricultural Research[19]. Given the demographics and growth agendas for the environment at a European scale, the urban agenda and natural environment will be key areas of focus in the future. Wider international activities will include a Defra-led global strategic alliance for research on animal health, and the Global Research Alliance on Agricultural Greenhouse Gases. A joined-up approach to EU and international activities with other UK stakeholders will continue to be ensured through the Global Science and Innovation Forum.

72. Defra statisticians have a long history of working with Eurostat, other international organisations and member states on developing the international statistical system. Important links are being further developed with other stakeholders – such as other Government Departments and industry bodies.

3.4 EIS Objective 2.4: Develop and organise the right skills, expertise and capabilities

73. Defra is committed to the development of core skills to support knowledge generation, capture, transfer and innovation. An environment is being created in which people have strong networks, have the processes embedded into ways of working, and the right technical tools to support this. Across Defra efforts have been stepped up to make sure specialists are better integrated into the work of all policy programmes so that policy reflects the best available evidence. Defra's specialists were also heavily involved across government in making sure that the spending review was evidence based, focusing resources where they have the biggest impact on the environment, growth and wellbeing.

16 Through the EU programme committees for the "Food, Agriculture & Fisheries, and Biotechnology" and "Environment (including climate change)" themes in FP7; and through the UK FP7 National Contact Point.

17 European Research Area Networks in areas such as livestock disease, plant health, organic farming, flood risk management, fisheries, and climate change.

18 Including the France/UK coordinated Agriculture, Food Security and Climate Change-JPI (FACCE-JPI). Further details are available at http://www.faccejpi.com/

19 Through Collaborative Working Groups in areas such as Agricultural Knowledge and Innovation Systems, Integrated Pest Management, animal health, and GM risk research.

74. Considerable progress has been made in joining up specialists across Defra, particularly through the oversight of Career Development Managers, and by integrating activities across specialist Career Homes (all of which are now administered by the same team). Examples of joined up working include:

- a Joint Specialist Conference was held in June 2010 with the aim of identifying areas where specialists in Defra can work together more closely. It is intended that more such joint events will be held in future, subject to funding constraints;
- a 'Masterclass Series' has been instigated. The aim is to raise awareness within the Department of the role of specialists in Defra, and to promote professions which people may know little about, but which could be of use to their work. It provides a forum for those in the specialist professions to give an overview of their work area and to highlight where and how they can be utilised and linked to other areas of Defra's work;
- a series of "Big Challenges" workshops have helped identify the links between programmes, and the people working on them, across climate change, ecosystems and food security. The outputs of the workshops have helped join up evidence programmes across Defra;
- the introduction of Evidence Plans has ensured a clear line of sight is developed from policy to evidence. The Plans have also helped identify how Defra's specialists support the various policy programmes, and which sorts of specialists support these programmes; and
- the role of Head of Profession (HoP) has been strengthened and a network of HoPs created to discuss and take forward areas of common interest.

75. Many of these activities (and in particular Evidence Plans and the Big Challenges workshops) have helped bring specialists and policy teams closer together, ensuring the links between evidence and policy are strengthened. As a result of the study of the impacts of evidence on policy making *(see Box 2 below),* processes will be strengthened to ensure evidence feeds into policy even more effectively than it does now.

76. Ways of recognising and rewarding good practice are actively being sought in the communication of evidence (such as those set out in case studies scattered throughout this document). The Science News Network has been set up to identify and promote good news stories coming out of Defra-funded evidence programmes.

77. Work is also underway to better join up evidence across the Defra network. This will ensure that best value for money is obtained from all evidence work funded by Defra and its agencies, and that there is better transfer of knowledge and a more consistent approach to ensuring the quality of evidence and advice which informs policy. An example

is the new Evidence Collaboration Group for Biodiversity established between Defra, Natural England, Environment Agency and the Forestry Commission.

78. Following reviews of workforce planning for scientists, engineers and veterinarians, a Workforce Planning Strategy is now being developed for all Defra specialists. This Strategy will identify how many specialists, and what sort of skills, the Department needs over the short and medium term. Inevitably the Spending Review settlement will impact on the numbers of specialists in Defra, but a clearer understanding of needs will mean specialists can be deployed efficiently and effectively. The Strategy will draw on data from Evidence Plans and from information collated by Strategic Human Resources to develop an accurate picture, and should be ready before Summer 2011. This Strategy will be used to drive forward future recruitment activities as well as shape learning and development plans for specialists.

79. Internally a more flexible and responsive approach is being developed to managing resources to ensure supply and demand is matched as effectively as possible.

80. The EIS identified a lack of social research expertise in Defra and since its publication new Government Social Researchers have been recruited, bringing the total number of social researchers in the Department to 13 (including the new Chief Social Researcher).

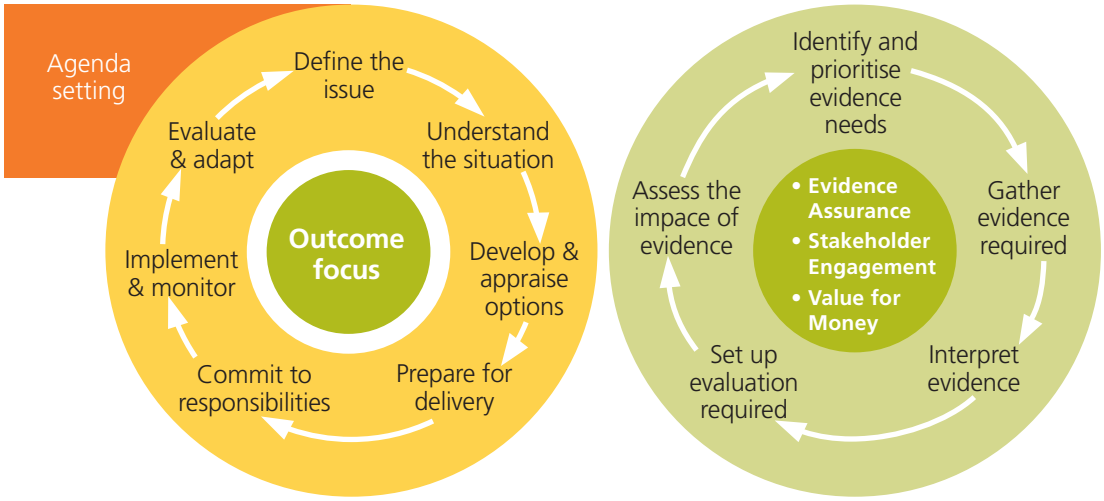
81. Defra relies upon a wide range of external suppliers to provide specialist capabilities and capacities to deliver its wide ranging policy responsibilities. Work will continue with suppliers to ensure Defra has access to the information and services that it needs. Given the pressures resulting from the increasingly challenging financial climate, efforts have been stepped up in this area and all evidence teams must consider external capabilities as part of their evidence planning and mitigate risks of lack of future availability.

3.5 EIS Objective 2.5: Refine our processes

82. Significant steps have been taken in the last six months towards embedding evidence more into business processes, and streamlining evidence processes to improve them and make better use of resources. Knowledge gathering and transfer practices are now embedded into guidance for commissioning and managing evidence activities, Evidence Plans, and Programme and Project Management Toolkits. This is supported by building networks and developing the technical tools to manage and share expertise and knowledge.

83. Additional training on Defra's evidence cycle, which sits alongside Defra's policy cycle (Figure 3), is now provided in standard staff training courses on the policy cycle and has been incorporated into senior Civil Servants' induction training. Updates to the internal Defra website pages on the policy cycle have made it easier for all Defra staff to access and use information on evidence, improving the links between evidence and policy.

Figure 3: Defra's Policy and Evidence Cycles



Defra Policy Cycle **The Evidence Cycle**

84. To streamline processes, the CSA no longer approves every piece of new R&D work and now simply reviews higher risk projects. These changes were introduced following adaptations to the CSA's role meaning that he now approves overall evidence budget allocations rather than focusing on all projects. On-going closer working between the CSA and agency chief scientists and Directors of Evidence will further ensure efficient and focused delivery within the Defra network.

85. Defra's financial tracking of evidence budgets has been improved, meaning that all evidence budgets can be more easily identified and managed. The Department's contract management systems are being reviewed (especially the Science Information System, SIS), and a project is progressing to bring all evidence records together in a new system. SIS will be decommissioned and the new system will go live in June 2011.

86. Defra's guidance to staff has been revised to include all forms of evidence procurement. Training sessions will be initiated for specialists to ensure they understand and implement the new processes.

87. Defra recognises the importance of making information and data as readily and easily available as possible. To achieve this, all data will be made publicly available wherever possible, whilst recognising occasional legitimate needs for confidentiality.

88. The EIS provided some excellent case studies showing how evidence has informed policy decisions across the Department, but recognised that little work had been undertaken in Defra to assess the impact or value of evidence on policy-making. The In House Policy Resource (IHPR) team was subsequently commissioned by the CSA to carry out a pilot study to assess to what extent key policy decisions are based on evidence, and how much of the evidence commissioned is actually used to influence policy or otherwise help deliver desired outcomes. More information is set out in Box 2 below.

Box 2: Assessing the Impact of Evidence on Policy

In autumn 2010 the In House Policy Resource (IHPR) team was commissioned by Defra's CSA to carry out a pilot study to assess how evidence has informed policy decision-making within four case study areas: Biodiversity, Flood and Water Management, Food and Farming LINK programmes and the Marine Environment including Fisheries. Evidence was defined according to Defra's Evidence Investment Strategy as *"reliable and accurate information that Defra can use to support sound decisions in developing, implementing and evaluating policy".*

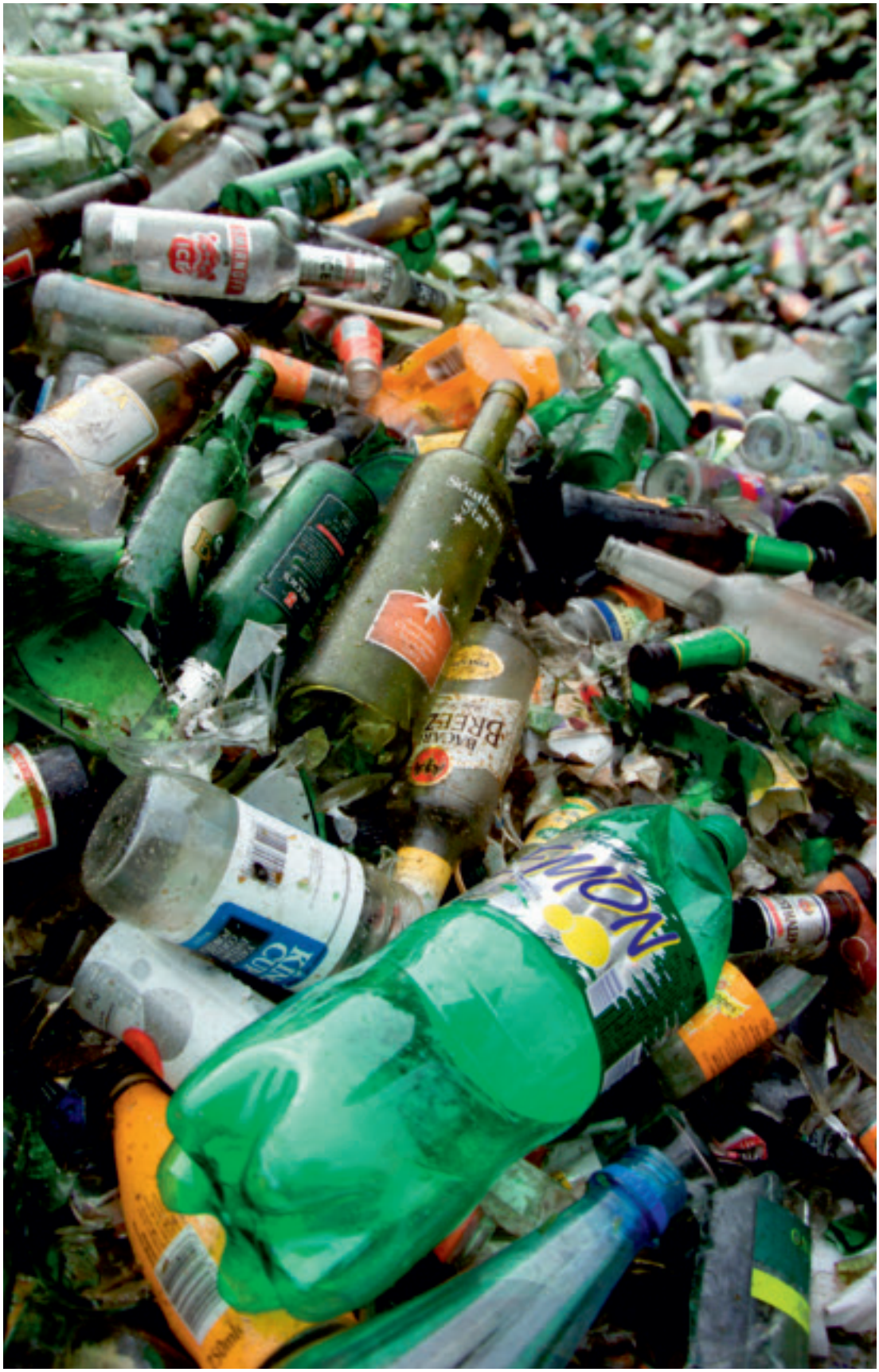
Specifically, the review team were asked to focus on two distinct but related questions:

- to what extent are key policy decisions based on evidence; and
- how much of the evidence commissioned is actually used to influence policy or otherwise help deliver desired outcomes?

The project completed its work in December and the full report (120 pages) has been published on Defra's website at: http://defraweb.maff.gov.uk/corporate/docs/policy/evidence-policy-report.pdf.

The results were encouraging, finding that policy was formed on the basis of good evidence, and that the commissioned evidence is genuinely used to further objectives. It gives considerable confidence that evidence processes are fundamentally sound, although it has only looked at a very small sample; and it found there is scope for improvement in systems and processes.

The report made a number of recommendations, and Strategic Evidence are now working on improving these processes, with colleagues across the Department, so that there will be assurance in the future that things are being done correctly without the need for resource-intensive studies. The option of carrying out in-depth investigations of this kind in specific cases where appropriate will also be retained.



Conclusion

89. Over the next four years of the Spending Review period, the Department will build on its successes to date and maintain commitment to address the evidence and policy challenges ahead. Officials will work collaboratively, think creatively, make best use of resources and focus on value for money. They will draw upon their strengths, but also identify and recognise where it is possible to improve capacity, capabilities and the evidence base, and how this can best be addressed.

90. This cannot be done by Defra alone. The broad range of complex policy issues with which Defra engages means it is increasingly important to collaborate and work with relevant stakeholders. More partnership opportunities will be sought with researchers and analysts across the country to ensure best use of joint resources and expertise. Existing links will be developed further with close working with the Research Councils to help deliver the evidence required to support policy in the period ahead.

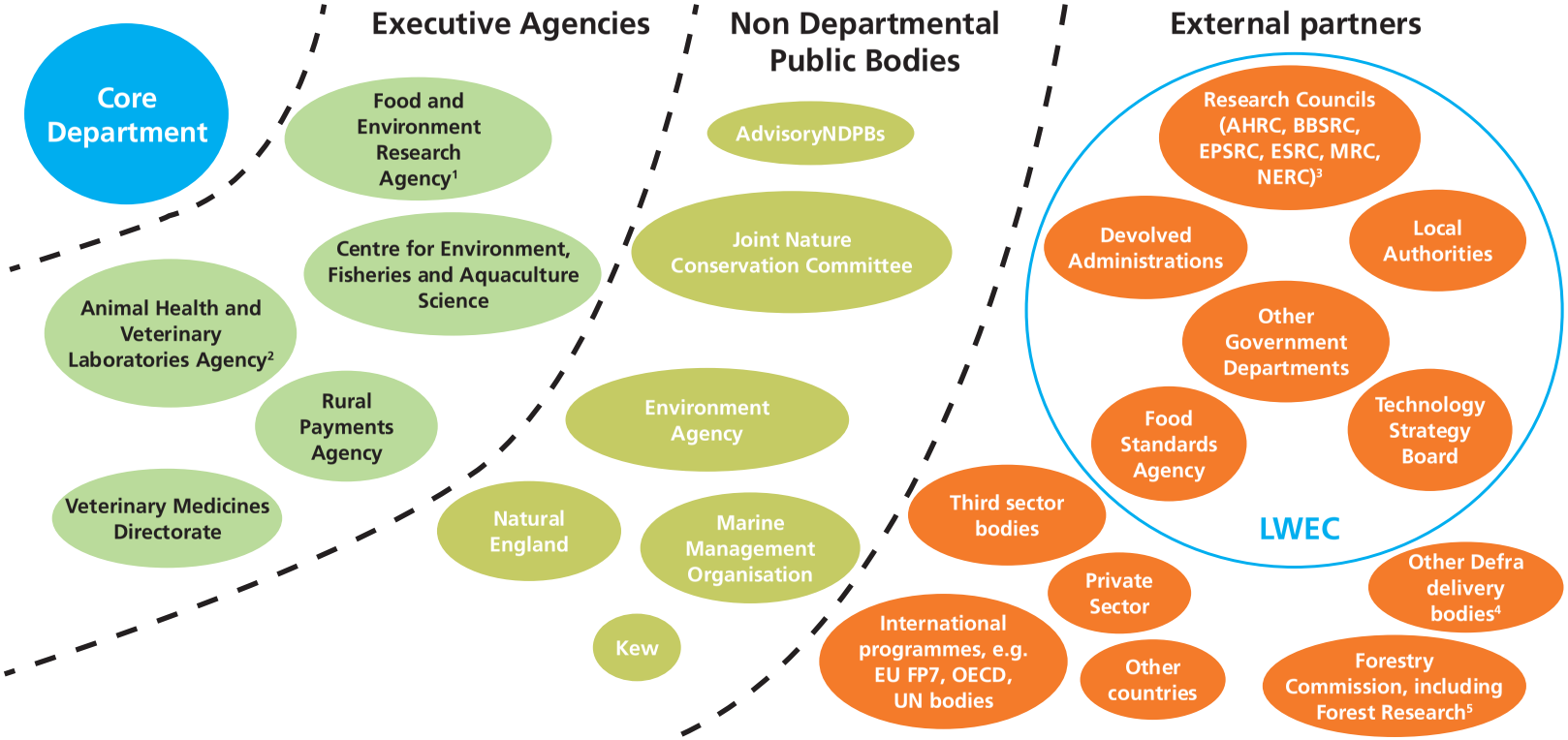
91. Where appropriate the Department will lead or contribute to discussions and collaborations with other funders, ensuring a joined-up approach which maximises value for money, makes best use of evidence and knowledge, draws on the widest pool of skills and knowledge, and ensures continuous professional development.

92. This updated Strategy links closely to Defra's strategic business priorities, and implementation progress will continue to be reviewed over the course of the next four years to ensure that Defra's evidence work is at the heart of its policy making.

Annex 1: Summaries from Defra Network Organisations and the Devolved Administrations

The Defra network is made up of many organisations which differ in terms of role, size and their relationship with Defra as set out in Figure A1. All organisations work together to develop and implement policies so that Defra's responsibilities are fulfilled. The network is complex, but the focus here is on the Executive Agencies and Non Departmental Public Bodies (NDPBs), as well as including contributions from the devolved administrations. These short synopses outline the role of the organisation, provide information on how the evidence activities support Defra's objectives, and set out the key changes to research and evidence gathering since the change in Government and as a result of the Spending Review.

Figure A1: Defra's Evidence Landscape (N.B. bubbles not to scale)



1 The Food and Environment Research Agency brings the Central Science Laboratory, Defra's Plant Health Division, Plant Health and Seeds Inspectorate, the Plant Variety Rights Office and Seeds Division and the Government Decontamination Service together into one agency.

2 The Animal Health and Veterinary Laboratories Agency was formed on 1st April 2011 from the merger of Animal Health and the Veterinary Laboratories Agency.

3 The acronyms stand for: AHRC -Arts and Humanities Research Council, BBSRC -Biotechnology and Biological Sciences Research Council; EPSRC –Engineering and Physical Sciences Research Council; ESRC -Economic and Social Research Council ; MRC –Medical Research Council ; NERC –Natural Environment Research Council.

4 e.g. Waste and Resources Action Programme, National Industrial Symbiosis Programme and the Carbon Trust.

5 Forest Research is a delivery body of the Forestry Commission.

1. Contributions from the Executive Agencies

Animal Health and Veterinary Laboratory Agency (AHVLA)

Our scientific activities are firmly linked to Defra's overarching objective to support a strong and sustainable green economy with particular reference to sustainable food production, the environment and biodiversity. The agency will spend approximately £100million in 11/12 gathering evidence, much of which will be from its own specialists comprising 800 vets, scientists and technical support staff. Some examples of our activities include:

- Design new diagnostic protocols that allow continuation of test and cull strategies alongside vaccination for some important endemic and exotic animal diseases such as bovine tuberculosis and classical swine fever. This work will provide the tools to develop more sustainable animal disease control policies that facilitate a greener more bio-diverse rural economy.
- The evolution of national and european policy for BSE is a fine example of evidence-based risk management that is still ongoing as the UK and other governments continue to relax some of the TSE controls based on robust scientific evidence. More recently studies elucidating the host range and transmission dynamics of zoonotic influenza viruses (e.g. human pandemic H1N1 influenza A virus and highly pathogenic avian influenza H5N1 virus) in UK livestock provide valuable evidence to address and manage the animal and public health threat posed by these zoonotic influenza viruses.
- Ongoing surveillance of certain endemic tick-borne and parasitic diseases such as louping-ill and babesiosis in ruminants indicate changes in disease patterns that may be early indicators of climate change adaptations by these disease agents.
- National and international reference laboratory functions provide early intelligence on the global epidemiology of exotic and zoonotic diseases that may affect the risk of incursion into the UK. Recent examples include the introduction of new types of HPAI viruses into Europe and spread of a new and emerging Salmonella strain in animals and humans in the UK and elsewhere.
- National Emergency Epidemiology Group (NEEG) is responsible for providing epidemiological analysis and advice in an outbreak. During an exotic disease outbreak NEEG provides timely analysis and advice that informs delivery and policy customers responsible for managing and controlling the outbreak.

Impact of new coalition Government and Spending Review

Changes already made or being reviewed include some consolidation of scientific departments at VLA to increase critical mass and flexibility, review of scanning surveillance requirements and delivery to provide a more fit-for-purpose service across the GB governments (ongoing).

Centre for Environment, Fisheries and Aquaculture Science (Cefas)

Cefas has an inspiring and challenging vision: to make a demonstrable difference to society by ensuring the long-term prosperity and well-being of industries, communities and individuals that enjoy and depend on the rich natural assets found in our marine and freshwater environments. With many competing demands, decision-making is complex, often international, and relies on the timely, integrated evidence and advice that we provide as recognised leaders in our field.

We have a clear purpose as the government's foremost source of marine evidence, applied science and impartial expert advice. This purpose is founded on our ability to innovate and to integrate a uniquely comprehensive national capability. It is enabled by the excellence of our science, technology and people; by effective collaboration and partnerships; and by applying commercial disciplines.

Working with partners across Defra and the wider public sector, we play a full part in successful delivery of government's marine-related priorities:

- Enabling innovation to enhance the competitiveness, resilience and sustainability of fishing and aquaculture industries. This includes working with Defra and industry to secure positive outcomes from Common Fisheries Policy (CFP) reform, and sustaining effective aquatic animal-disease controls.
- Leading on the national evidence base and providing trusted advice to support sustainable development of marine and coastal environments, and so help achieve the ambitions of the Marine and Coastal Access Act. Related activities also inform the Marine Policy Statement and the Natural Environment White Paper, and prepare Defra for cost effective implementation of the EU's Marine Strategy Framework Directive.
- Improving human health and well-being through our expertise on food safety and food security, working closely with the Food Standards Agency.
- Supporting the "green economy" and UK energy policy through our work relating to offshore renewables and by providing leadership on marine climate change adaptation.

Cefas has a £60m turnover, over 500 staff at specialist facilities in Lowestoft and Weymouth, and a 72m research vessel. About a third of our income is won competitively from public-sector and wider-market customers beyond Defra. This brings valuable additional evidence and experience to support Defra priorities, and contributes towards investment that supports Cefas' long-term viability.

We are responding to funding challenges by further diversifying revenue streams, and by continuing to nurture partnerships. Examples from across the marine sector include our integration of Joint Nature Conservation Committee (JNCC)/Natural England (NE)/ Defra marine-monitoring programmes aboard the RV Endeavour, aligning research programmes with NERC laboratories, and establishing university alliances such as that with University of East Anglia (UEA) to develop ecosystem services capabilities.

The Food and Environment Research Agency (Fera)

The Food and Environment Research Agency (Fera) has a single coherent vision that emphasizes the values that guide the work it does and how it works with Defra, the wider public sector and its private sector customers:

To be the long term partner of choice to governments, industries and academia, in applied research, incident response and impartial advice, based on our trusted science, to secure the food chain and protect the environment from global threats.

Evidence based on trusted science and the ability to provide impartial advice is enshrined in Fera's vision and underpinned by four science themes: plant (and bee) health and crop security, wildlife management, environmental risk and food safety.

It is through these science themes that Fera's evidence work is aligned with, and lead by, Defra priorities in the food and environment sectors through its capabilities in research, regulatory services and emergency response.

As part of a joined up national Plant Health Service Fera uses plant health and crop security science to develop advanced diagnostics, provide scientific and risk based advice, and develop pest and disease control and eradication strategies.

In the area of bee health, Fera's evidence work is focused on bee pests and diseases and management strategies to achieve a sustainable and healthy honey bee population for pollination and honey production.

Within the wildlife research area, Fera provides the national lead on the majority of terrestrial human-wildlife conflicts relating to wildlife and emerging disease, and wildlife management.

Environmental risk scientists at Fera address land-use and associated contamination issues. Predominantly this work focuses on agricultural inputs but includes wider pollutants such as human pharmaceuticals and engineered nano-particles.

Food safety science is focused on detecting chemicals in food to protect human health. Fera specialises in the analysis of trace levels of both organic and inorganic contaminants in food, including residues of food production chemicals and food contaminants.

In all its areas of core competence, Fera's expertise in evidence provision extends beyond the UK through the activities of its staff serving on a wide range of international expert committees.

Fera's annual income is in the order of £68m and it has a staff of around 840 on a Full Time Equivalent (FTE) basis. Approximately £29m of Fera's income is in connection with evidence work and is delivered by just over 350 FTE scientist posts. Looking more specifically, around £14m of the evidence portfolio is funded through Defra to meet its need for science, surveillance and monitoring within the area of Fera's four science themes.

Rural Payments Agency (RPA)

The Rural Payments Agency's (RPA) core business is administering the European Union Common Agricultural Policy (CAP), making and accounting for payments to English farmers and operating related schemes, tracking livestock and carrying out inspections.

Although RPA doesn't formally commission evidence based research, it gathers and undertakes analysis of data on many aspects of land quality, environmental conditions and agricultural activities. This data is used to inform decisions around farmers' eligibility for payments as well as tracking livestock movements and contributing to food safety. The RPA's farmers' panel and stakeholder meetings also offer a good vehicle for stakeholder and customer engagement and evidence gathering. The farmer's panel is available to the whole Defra Network.

RPA has made significant investment in electronic services. A pilot e-channel service for submitting Single Payment Scheme (SPS) annual applications online was piloted in 2009 and over 16,000 SPS applications from around 105,000 applications were submitted in 2010. RPA is aiming to double the number of applications received electronically for 2011.

As well as electronic services for scheme applications, RPA operates the British Cattle Movement Service (BCMS) which registers the births, movements and deaths of cattle in the UK. Around 80% of these notifications are submitted via e-mail or online software.

RPA's Rural Land Register (RLR) is a Geographical Information System (GIS) based Land Parcel Identification System (LPIS) which holds a digital record of all registered land parcels in England. RPA provides a comprehensive range of GIS services to the Defra network. This includes management of digital mapping from Ordnance Survey and other suppliers, spatial data capture from Remote Sensing and Global Positioning Systems (GPS), spatial data analysis, advice on the use and effectiveness of GIS, and supporting Defra on the use of Rural Land Register data and cartographic map production services.

RPA undertakes a wide range of on-the-spot inspections. Many are carried out on-farm to check land information provided in applications for payment and confirm that 'cross compliance' standards are being met. Cross-compliance requires that livestock identification and movement records are checked, that there is evidence of preservation of flora and fauna, wild birds and habitats, and the use and storage of plant protection products standards are adhered to.

As well as on-farm inspections, RPA undertakes a range of technical inspections such as collection of samples for pesticide residue tests. RPA contributes to the development of food marketing standards, provides technical advice to Defra, advises traders on regulatory requirements, and carries out enforcement and prosecution investigations.

One of the key areas for RPA during 2011 and 2012 will be supporting Defra with negotiations around the emerging new Common Agricultural Policy (CAP) due to be implemented in 2013. RPA will provide regular evidence based assessments to Defra on the potential delivery impacts of the emerging European Union CAP proposals.

Veterinary Medicines Directorate (VMD)

The Veterinary Medicines Directorate (VMD) is a net running cost Agency, receiving nearly 80% of funding from industry fees and levies and the remainder from Defra. The approximately 150 staff of the VMD comprises more than 35% scientists involved mainly in the assessment of evidence for the authorisation of veterinary medicines but a small proportion are involved with other evidence related activities related to residues surveillance and the impact of the use of veterinary medicines. The remaining staff work on evidence based policy related activities and in support roles.

Although a Defra Agency, the VMD has UK-wide responsibility for veterinary medicines regulation. In regulating veterinary medicines it works closely with Defra and with the devolved administrations to help and advise them on the delivery of their animal health objectives where veterinary medicines have a role. The VMD also works with other Government Departments (OGDs) which have responsibilities for areas of work that are included in the VMD's regulatory remit (e.g. the Food Standards Agency (FSA) on food safety, Home Office on controlled drugs).

Medicines regulation is harmonised across the EU (including the European Economic Area (EEA) countries) and the VMD operates as part of the European Medicines Regulatory Network (EMRN) to deliver the processes leading to the authorisation of veterinary medicines.

The work of the VMD directly contributes to the support and development of British farming and encourages sustainable food production. By supporting the prudent use of animal medicines the VMD promotes animal welfare and also minimises the impact of animal medicines on the environment.

R&D identified and supported by the VMD provides the evidence necessary to underpin veterinary medicines and antimicrobial resistance policy and residues surveillance to ensure that veterinary medicines are safe for operators to use, are efficacious and do not leave harmful residues in food of animal origin produced for human consumption. The cost of VMD supported R&D in 2010/11 is approximately £1.4m.

In addition to the R&D, the VMD manages two programmes of residue surveillance. The smaller programme is funded by Defra and concentrates on collection and analyses of samples of animal produce purchased at retail, focusing mainly on food produced outside the UK. The cost of the programme is approximately £1m in 2010-11.

The larger programme is undertaken to comply with EU requirements and analyses samples from UK production to ensure compliance with residue regulations. This programme is funded entirely by industry at an approximate cost of £4m in 2010-11.

2. Non-Departmental Public Bodies

Environment Agency (EA)

The Environment Agency was established to protect the environment and to contribute to sustainable development. Its vision is to create a better place for wildlife and people, and its key roles are as follows:

- We prioritise investments between programmes – as a member of the Defra family, we provide evidence to support Defra's three key priorities where this aligns to our remit and expertise.
- We focus on the right things – we are producing evidence action plans for our key business areas which identify 1) the critical evidence gaps which will help us to move from where we are now to where we want to be in terms of outcomes for the environment and people 2) opportunities to innovate to deliver more for less.
- We improve co-operation – we participated in the Defra Evidence Forum and are working with Defra on a number of joint evidence plans e.g. Flood Risk, Better Regulation and Water.
- We develop and organise the right skills – we have identified the skills and knowledge base we need to fulfil our remit and to act as an expert advisor to Defra and are working on the partnership arrangements we need to support our in-house skill and knowledge base.
- We improve the way we work – we are changing our ways of working in order to meet the challenges ahead and to be the best we can.

The budget allocation for the Environment Agency's Evidence Directorate in 2010/11 which is dedicated towards Research, Monitoring & Innovation is £9.6m. This figure includes both manpower and project spends.

There are currently 72 FTEs working within the Environment Agency's Evidence Directorate on Research, Monitoring & Innovation.

Key changes to research and evidence gathering as a result of the change in Government and also the Spending Review include:

- We have set up an Evidence Directorate with 30% less resource than in 2009/2010, designed to provide compelling evidence to underpin our work delivering the objectives of both Defra and WAG.
- We have produced an Evidence Guide, which sets out our vision, mission,role and ways of working.
- We are working with other members of the Defra family in a more integrated way, to deliver more for less, e.g. monitoring, horizon scanning, and joining up our evidence plans.
- The Environment Agency is placing a clear priority on engaging in fewer, more strategic partnerships to deliver evidence and positive environmental outcomes, e.g. LWEC.
- We are looking at how we can best support the government's localism and big society agendas through better engagement with local authorities, communities and people.

Joint Nature Conservation Committee (JNCC)

The JNCC is the statutory adviser to Government on UK and international nature conservation. Its work is organised under three strategic goals. One of these is to inform decisions that affect the natural environment through the provision of a sound UK, EU and global evidence[20] base. The purpose of JNCC's evidence gathering activities is to generate credible, quality evidence and advice relating to UK-wide and international terrestrial and marine nature conservation. Activities are determined by a 3-year corporate plan developed by the Joint Committee in consultation with sponsoring departments, and delivered through annual business plans. Some examples of JNCC's work include the development of terrestrial and marine monitoring strategies, managing long-term monitoring and recording contracts (birds, bats, butterflies, biological records centre etc), marine assessments, marine mapping, and contributions to the National Biodiversity Network.

The data collected, and evidence produced, by JNCC is broad in scope to help provide the flexibility and scalability needed to meet the varied and changing requirements for information without disrupting the critically important long time series of comparable data. This is assisted through the development of high quality, peer-reviewed, scientific analytical and interpretation techniques. For the terrestrial and freshwater environments JNCC works in partnership with very efficient voluntary sector networks but this is not possible for the marine environment. JNCC tailors the collection and analysis of data to provide evidence to meet international agreements, especially the European Directives and the international framework of biodiversity goals and targets, and contributes to implementation of the UK and country biodiversity strategies. Several of the pieces of evidence produced by JNCC are national statistics that contribute to the UK framework of biodiversity indicators (breeding birds, butterflies and bats).

JNCC produces evidence through a series of programmes that collectively contain in the order of 30-40 scientists with some degree of evidence specialism. These include monitoring ecologists, GIS experts, database managers, analysts, economists and staff with highly developed presentational skills. In 2009/10, JNCC also commissioned research, including national monitoring, to the value of just over £1.8m, additional in-house research is also carried out.

Funding for evidence related activities in JNCC has been maintained and protected in the medium to long term but significant efficiency savings have also been made, largely in the terrestrial survey and monitoring area. These savings will be re-invested to bolster the UK capacity to meet European obligations and other evidence requirements (e.g. annual vegetation survey, better use of remote sensing of habitat quality and extent). Increased effort will also be put into analytical techniques and interpretations to help meet new and emerging requirements for evidence. Finding indicators of ecosystem service trends and status, supporting ecosystem assessments, and assisting economic valuation of biodiversity are some new applications of evidence that JNCC is considering.

20 Evidence includes both monitoring, with its associated methodological research and regularly interpreted outputs (e.g. status assessments and trends) and research, underpinned by a data management (access) infrastructure

Marine Management Organisation (MMO)

Our role is to ensure that activities in the marine area take account of economic, social and environmental needs to contribute to the achievement of sustainable development in our seas. Our functions include fisheries management, marine licensing and marine planning.

All evidence gathered by the MMO supports our decision making and enables us to help deliver Defra's marine policy objectives. In doing so, we collaborate with key partners wherever possible on evidence needs and data initiatives.

The MMO and Defra have special arrangements concerning Defra's Marine Evidence Programme. The MMO is expected to participate in the evaluation and monitoring of work that is of interest to the MMO. We have aligned our evidence plan for 2011/12 with the four themes developed in the Defra Marine Evidence Programme. In addition, we look to make available to others the information we gather within our regulatory function in the marine area as part of on-going work to monitor and assess marine activity

As described above, the MMO has special arrangements with Defra concerning marine evidence. Under these arrangements, £2.4 million was spent with Cefas as direct MMO operational support for marine licensing and planning. Outside of this we have spent £150,000 supporting Marine Planning, £225,000 supporting Fisheries Management, and £340,000 supporting the Evidence Data and Knowledge Management Team (EDKM). In total, the MMO has spent £715,000 alone, when including Defra spend on R&D to directly support the MMO this increases to £3,115,000. It should be noted that the MMO has been undergoing a period of development during 2010/2011, and that procurement was put on hold during the Spending Review to ensure alignment with central government.

Pre Spending Review, the MMO had intended to have 30.8 FTEs in its Decision Support function split across EDKM (19), Statistics and Analysis (9.8) and Strategic Development (2). Post Spending Review this has been reduced to 12 FTEs in EDKM, 8.8 in Statistics and Analysis and 1 in Strategic Development.

The MMO has reconsidered its model for providing technical expertise into the organisation in light of the Spending Review. We have moved to a flexible commissioning model which enables us to reduce fixed costs by not recruiting 5 x G7 Technical Experts, whilst still providing the intelligent customer capability to outsource such expertise to meet the demands of the organisation.

Natural England (NE)

Natural England's purpose is 'To ensure that the natural environment is conserved, enhanced and managed for the benefit of present and future generations, thereby contributing to sustainable development' (NERC Act 2006).

As a key environmental delivery organisation, we require evidence to inform the way that our interventions are designed and delivered. As the Government's statutory advisor on the natural environment, we provide practical advice, grounded in science, on how best to safeguard England's natural wealth for the benefit of everyone. The cornerstone of our work is evidence. Everything that we do and say is informed by robust, high quality evidence. Consequently, we work, usually in partnership with others from the public, private and voluntary sectors, to build and share the evidence base on:

- The state of the natural environment (and of the way that people engage with it).
- The impact of interventions on the natural environment.
- How we can shape future interventions to secure the best impact.
- Our wider understanding about the natural environment, how it works, and its value.

Natural England's evidence work contributes to Defra's objectives in a number of ways, for example:

- We measure the impact of agri-environment interventions and lead focused research on farmland birds and grassland management on behalf of Defra.
- In the marine sphere, we develop evidence to support the implementation of new Natura 2000 designations and the Marine & Coastal Access Act.
- In the terrestrial context, our work on the current state of species and habitats will be central to taking forward the recommendations of the Lawton Review and building the ecological networks of the future.
- We provide up to date and robust information on people's day-to-day use and enjoyment of the natural environment, in a project jointly funded by Natural England, Defra and Forestry Commission.

Natural England's 2010/11 budget for evidence was £7.6m, comprising £6.0m on monitoring (which includes environmental monitoring, surveillance and evaluation) and £1.6m on wider research (which equates to Defra's R&D category).

Within the organisation, we have a range of technical and scientific skills. Specifically, we have over 120 national environmental specialists who maintain the currency of our expertise, provide broader training for our wider staff – as well as providing technical advice to government and others and supporting the development of the evidence base through monitoring and research projects.

As a result of the Spending Review and Arm's Length Bodies review, Natural England will have a smaller, more focused evidence programme, with the majority of funding targeted at statutory monitoring and surveillance. We will continue to work closely with Defra and its delivery network – sharing and evolving our evidence priorities, exploring ways in which we can work together to meet these needs and sharing the evidence and data that we already have to ensure we secure full value from it.

In response to the Government's Big Society agenda we are working closely with the voluntary and community organisations in monitoring the natural environment, and are developing our dissemination of evidence to support localism.

The Royal Botanic Gardens, Kew (RBG, Kew)

The mission of the Kew gardens is to inspire and deliver science-based plant conservation worldwide to enhance the quality of life. Kew provides plant-based solutions to environmental challenges through Kew's Breathing Planet Programme (BPP) and seven key strategies - accelerating discovery and global access to plant and fungal diversity information, mapping and prioritising, conserving what remains, sustainable local use, seed banking through the Millennium Seed Bank Partnership, restoration ecology and inspiring through botanic gardens.

Kew's collections, information and expertise are unparalleled in size and international scope presenting a microcosm of the plant diversity of the world. Below are examples of how Kew's BPP is contributing to Defra's Priorities:

Priority 1– Support and develop British farming and encourage sustainable food production

- Kew identifies markets for UK-based products by research of more UK flora.
- On show at Wakehurst Kew interprets and encourages sustainable food production.

Priority 2 – Help to enhance the environment and biodiversity to improve quality of life

- The MSB Partnership has successfully stored seed from most UK native plants.
- Kew scientists are testing a universal plant DNA barcode for accurate identification.
- Kew will launch the first evidence-based assessment of the state of the world's flora.
- Kew launched an interactive global map of plant data using the latest technology.
- Kew provides research and policy support for plants and fungi under the Convention on Biological Diversity (CBD).
- Botanic gardens are uniquely placed to support restoration.
- Kew researches sustainable traditional and novel uses of plants and fungi.
- Kew's Library, Art & Archives is the most important plant reference source globally.
- The visitor experience aids learning for biodiversity and environmental challenges.

Priority 3 – Support a strong and sustainable green economy, resilient to climate change

- Governments and industry are turning to Kew for help in restoring damaged ecologies in Africa, advising mining companies on environmental impact and deriving plant-based approaches to tackling HIV and malaria.
- Kew is finding new or known compounds with medicinal properties in UK species.

There are approximately 267 evidence specialists in the organisation.

Allocation of budgets for evidence and R&D have been based on income directly attributable to a corporate strategy (strategies 1-7), and have been allocated accordingly; project and capital income matches project and capital expenditure; admissions income is for strategy 7; general income excluding grant-in-aid (g-i-a) is allocated to corporate strategies in proportion to expenditure; Defra g-i-a has been allocated 55 per cent to strategies 1-6 in proportion to expenditure, 45 per cent to strategy 7.

Following the change in Government and Spending Review, Kew will review on a regular basis its ability to reach targets and may suspend programmes or slow their progress.

3. External Partners – Non Ministerial Departments

Forestry Commission (FC)

Our **mission** is to protect and expand Britain's forests and woodlands and increase their value to society and the environment. We deliver the distinct forestry policies of England, Scotland and Wales through specific objectives drawn from the country forestry strategies. All three countries require efficient and sustainable forestry practice, which integrates effectively with other rural and urban land-uses and wider government policies. We therefore work in partnership with other organisations, through fora such as LWEC and CAMERAS in Scotland, to enable the delivery of our objectives and assist the delivery of wider objectives of government and society. This supports Defra's business plan commitment to 'Support a strong and sustainable green economy, resilient to climate change'.

Our Corporate and Forestry Support Division is responsible for the provision of authoritative information on GB forests and of robust evidence underpinned by sound science. This contributes to the development of industry standards, operational practice, and the provision of national and international forest policy. A Research Strategy Management Board oversees and directs the delivery of:

- a Science and Innovation Strategy for British Forestry, and;
- annual programmes of research and research services to support the devolved administrations, the wider forestry sector, and GB activities.

Our Science and Innovation Strategy is based on horizon scanning and the research and evidence needs range from strategic, sometimes long-term, research and monitoring in support of policy, to technical development in support of practice. A key area, increasing in importance, is securing the long term health and vitality of our forests, trees and woodlands, through understanding the threats which they face from pests and pathogens. A major cross-cutting thread for our research is how forests and woodlands help society adapt to, and mitigate, the impacts of climate change. This research complements a number of Defra's strategic business priorities by:

- Helping to enhance the environment and biodiversity to improve quality of life.
- Supporting a strong and sustainable green economy, resilient to climate change.
- Preparing for and managing risk from animal and plant disease.

We invest public funds in forestry and woodlands research to provide the evidence base for the development and delivery of policy. This ensures that the UK's forests and woodlands can maximise their contribution to the social and cultural development of communities.

Our main research provider is our GB-wide research agency, Forest Research. The Agency has a long history of providing high quality research to inform the development of forestry policies and practices, and promote high standards of sustainable forest management. This close relationship has been instrumental in effecting rapid knowledge exchange, frequently initially on the public forest estate, and then gaining wider adoption by the private sector and industry. The Forestry Commission, in its GB role, currently provides two thirds of the funding for Forest Research and this spend will be £9.8 million in 2011/12 (figures exclude capital and depreciation). The remaining third of Forest Research's income is currently secured from a range of clients such as the EU and other Government Departments, which we anticipate will reduce over the next four years.

To ensure the most effective use of the resources we have, we will look towards more partnerships with other departments and agencies, the EU, and the private sector in the coming years.

4. External partners – The Devolved Administrations

Northern Ireland

DEPARTMENT OF AGRICULTURE AND RURAL DEVELOPMENT FOR NORTHERN IRELAND (DARD, NI)

The vision of the Department of Agriculture and Rural Development (DARD) is a thriving and sustainable rural community and environment in Northern Ireland. The Department has 5 associated strategic objectives as follows:

- To help the agri-food industry prepare for future market opportunities and economic challenges.
- To promote the economic and social wellbeing and self-reliance of the rural community.
- To enhance animal, fish and plant health and welfare.
- To help deliver improved sustainable environmental outcomes.
- To manage our business and deliver services to our customers in a cost effective way.

DARD's Evidence and Innovation Strategy, published in 2009, provides a framework for our research and development activities. One of the specific principles of the Strategy is that research will be policy-led and aligned to meet the strategic policy needs outlined above in order to provide a robust evidence base for future policy development, implementation and review, as well as supporting industry innovation within the scope of our policy interests.

DARD invest around £8-9 million per year to support a range of research and development activity, delivered primarily by our arm's-length science provider, the Agri-Food and Biosciences Institute (AFBI). DARD funded research at AFBI from 2011/12 includes work on optimising biological and financial efficiency of farm businesses; assessment of the needs for, and returns from education and skills attainment within the land-based, food and other rural sectors; new techniques/approaches to disease prevention and control; mitigation of greenhouse gas emissions; and optimisation of the environmental credentials of local agri-food produce and renewable energy.

A further principle of the Strategy is that we will pursue opportunities for collaboration and engagement with local, national and international research partners and seek to encourage similar collaborations among rural businesses and public sector research organisations. As our Strategy becomes further embedded, we have been seeking to deepen our collaboration with Defra, other devolved administrations and the Republic of Ireland in areas of mutual interest and benefit. Examples of existing collaboration include the Defra-led Agricultural Greenhouse Gas (GHG) Inventory R&D platform where DARD is contributing £0.61million (5% of the total cost) over 5 years; the Food and Agriculture Policy Research Institute – UK project; and Defra / BBSRC / FSA-led research and development aimed at reducing levels of *Campylobacter* in the food chain.

Given current constraints on national public sector funding and, in line with the EU 2020 Strategy Flagship Initiative: Innovation Union, DARD is also seeking to extend its engagement with other European partners in drawing down funding from FP7 and its successor, as well as other relevant programmes.

Scottish Government

The role of the Scottish Government in the Rural Affairs, Environment and related areas is:

"To provide high quality scientific and analytical advice and analysis to support the development and delivery of key policies including climate change, land use, food and drink, rural development, resource use, sustainable production, broader environmental issues and renewable energy."

The Scottish Government shares a similar philosophy to that of Defra as regards the role and importance of evidence in supporting policy development. This greatly facilitates working in partnership with Defra and aligning resources in areas of joint interest, e.g. we are both partners in the 'Living With Environmental Change' and 'Global Food Security' initiatives.

Our investment of approximately £50m per year in rural and environment related science is essential to the maintenance of the Scottish science base in this area which makes a significant contribution to the UK science base.
The ongoing availability of the skills and expertise supported means that they can also be utilised by others including Defra, notably the Scottish Agricultural College.

The Scottish Government maintains a team of 10-12 research advisers that provide an interface between commissioned research and policy customers. In addition an in house team of analysts including economists, social researchers and statisticians provide a more immediate service in support of policy. A Contract Research Fund of ca. £5m enables both short term pieces of policy driven work to be commissioned for the Scottish Government and for co-funding opportunities with others, including Defra, to be supported – e.g. the Scottish Government is contributing £1.2 million (10% of the total cost) over 5 years from this fund to the Agricultural GHG Inventory R&D platform led by Defra.

Financial pressures have reinforced our current direction of travel to commission multidisciplinary work that produces integrated outputs that are meaningful to the policy making community and relevant to key economic sectors. At the same time we are, through partnerships with the Scottish Funding Council and others, seeking to broaden the base of the expertise available to us by requiring our traditional research providers to work more closely with the university sector.

Welsh Assembly Government

The Welsh Assembly Government is the executive body of the National Assembly for Wales, which is led by the First Minister. Within the Welsh Assembly Government, the Sustainable Futures Directorate delivers policy across a broad range of interconnected areas which covers the Department for Rural Affairs and the Department for Environment and Sustainability.

The Welsh Assembly Government recognises that robust, relevant and appropriate evidence is fundamental to support both the development and the effective delivery of a number of policies. As the Defra evidence budget, which amounts to approximately £210m for 2010/11 covers England and Wales, it is essential that existing governance arrangements between the Welsh Assembly Government and Defra are further strengthened on both a strategic and operational level to ensure that Welsh needs are reflected in research programmes.

With recognition of the fact that goals may differ in some policy areas, a network of Welsh Assembly Government officials work closely with Defra counterparts throughout the management process across the suite of 35 Evidence Plans to identify and develop research needs for England and Wales.

Such activity includes Welsh Assembly Government representation at research programme and project level for Defra managed programmes such as Atmosphere and Local Environment, Adapting to Climate Change, RERFC (Resource Efficient and Resilient Food Chain), Environment Stewardship and Agriculture and Climate Change to ensure Welsh research priorities are met. This includes direct engagement with project boards e.g. the Agricultural Greenhouse Gas Inventory R&D platform and the Sustainable Behaviours Centre.

The Welsh Assembly Government works with the Agencies; the Countryside Council for Wales, the Environment Agency and the Forestry Commission in developing a shared evidence base for Wales. This activity is underpinned by collaborative partnerships such as the Wales Environment Hub (WERH), which helps to co-ordinate environmental research in Wales and LWEC, both of which the Welsh Assembly Government is a partner.

In addition, the Welsh Assembly Government encourages collaborative working with the wider UK research community to meet its strategic evidence needs e.g. UK National Ecosystems Assessment, the Foresight programmes, Technology Strategy Board, Research Councils and other devolved administrations.

Department for Environment, Food and Rural Affairs

Nobel House
17 Smith Square
London SW1P 3JR
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