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Annexes to the report are available separately

My name may be on the front of this report, but it represents the culmination of several years’ worth of work within two teams in Defra and a wider network of policymakers, academics and consultants: none of this would have been achievable on my own. I would particularly like to thank Michael Harrison & Angela Coulton of Defra for setting the challenges; and to acknowledge the amount I have learned from Tony Taig of TTAC Ltd, Mike Stephenson of IBM, Alex Bielak & Shealagh Pope of Environment Canada, and Mike Thomson of Delta Partnership. I am very grateful to Laurence Cranmer of Delta Partnership for his help in finalising this report. There are many others whose contributions are more diffuse, but no less important.

The cover illustration was created by putting the entire text of this report into Wordle (<http://www.wordle.net>): the size of each word is proportional to the number of times it was used in the report. Wordle is licensed under a Creative Commons Attribution 3.0 United States license.

## Terminology used in the report

**Data:** qualitative & quantitative measurements stored in a format that allows later analysis & interpretation.

**Information:** data that has been analysed & interpreted to tell a story about a situation.

**Evidence:** “information, etc. that gives grounds for belief; that which points to, reveals or suggests something” (Chambers English Dictionary, 1994 edition). Evidence fulfils five functions in the policy process: it can confirm what you think you know, challenge received wisdom, enrich our understanding, explain complex issues or scope opportunities for change.

**Evidence-based policymaking:** There are many different definitions of the term “evidence based policy making” but essentially it refers to an *approach* to policy development and implementation which uses rigorous techniques to develop and maintain a robust evidence base from which to develop policy options. All policies are based on evidence - the question is whether the processes of sourcing and using the evidence in policy are as robust as the evidence itself.

**An evidence base for policy** is constructed of three types of information: statistical data, analytical evidence and views or opinions from stakeholder engagement. It includes qualitative and quantitative information. Research is an important component of the evidence base, but it is not the only one.

**Robust evidence for policy:** because evidence for policy contains three types of information, there is no single criterion that defines robustness. Instead, the literature identifies [five criteria](#) which help determine how to improve the robustness of your evidence and which apply to all types of evidence for policy.

**Knowledge for policy:** what is known about an issue in the context of what needs to be achieved; the synthesis of expertise & interpretation according to one’s own experience and how this is applied to the pursuit of policy goals. There are two approaches to thinking about knowledge: the first places knowledge in a hierarchy of data, information, knowledge and wisdom. Information is data set in context, knowledge tells us how to use that information, and wisdom tells us when to use it. The second divides knowledge into explicit and tacit. Both approaches are useful in discussing knowledge for policy.

**Explicit knowledge:** knowledge that is has been, or that can be, articulated and stored so that it can be transferred to others (e.g. research reports).

**Tacit knowledge:** knowledge that is carried in people’s minds: it can only be gained through personal experience, and is not easily transmitted without personal contact or training. How individuals gain and use tacit knowledge relates to their core values, assumptions and beliefs.

**Knowledge management for policy:** deliberate efforts to support a Department’s achievement of policy goals through creating, sharing and leveraging knowledge from internal and external sources. Knowledge management is as much about the quality of the interactions between the people who use the evidence base as it is about the quality of the individual pieces of evidence.

**Knowledge broker:** an individual or organisation who plays an active role in scoping, assembling and interpreting evidence for policy, spanning domains of knowledge to bring insights.

**Policymaker, policy analyst:** Policymakers lead the development and implementation of Government policies. Policy analysts, generally part of policymaking teams, use their disciplinary knowledge to provide support to policymakers.

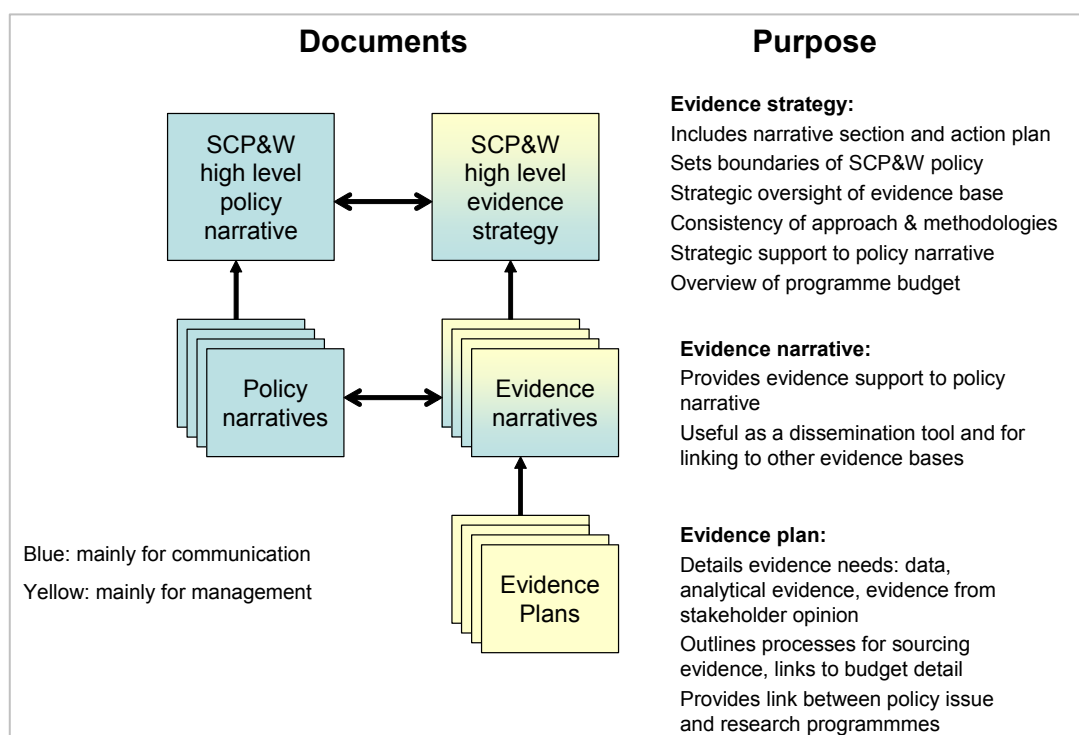
## Executive summary

This is the report of a project to synthesise, clarify and codify the knowledge gained from a series of consultancy projects with Defra's Science Strategy and Sustainable Consumption & Production & Waste (SCP&W) evidence base teams. The report was written in 2008 though the background work took place between 2003 and 2007. It is based on a mixture of judgment from the work that I have done over the past five years for Defra, and evidence from the literature. Numbered references in the text refer to the annotated bibliography in Annex A2.

The main argument in this report is that **the processes of sourcing and using evidence in policy need to be as robust as the evidence itself**. In 2004, Tony Taig wrote: "Defra should be at least as well focused on using knowledge as it is on advancing knowledge." [1]. Based on this, Defra's Science Strategy team developed a framework for evidence-based policymaking, outlined in *Our Approach to Evidence & Innovation* [5]. For a little extra resource, the SCP & Waste evidence teams could add significant value to Defra's evidence base: this report proposes a structure to support the processes of evidence-based policymaking, a suite of tools to implement it and an outline of the necessary skills.

### Recommendation 1: A clear structure for the evidence base would provide coherence, improve strategic oversight, and emphasise the functional relationship between evidence and policy.

The key characteristic of evidence for SCP&W policy is that it cuts across traditional boundaries. Because of this, the SCP&W evidence base needs a high-level focal point which pulls everyone in the same direction and which readily allows new pieces of evidence to be set in context. While there are many mid-level documents and activities which foster links between the evidence base and policy (notably the draft evidence narrative from the Environmental Behaviours Unit, the waste action plans and the Milk & Dairy Roadmap), these are not pulled together into something that facilitates strategic oversight of the whole evidence base.



### Suggested structure for an evidence-based approach to policy-making

A suggested structure for an evidence-based approach to policymaking is outlined above. It builds on existing examples of good practice, and shows how they could be linked together under an overarching SCP&W policy narrative:

- updates in one document trigger updates elsewhere in the system
- the way evidence narratives and strategies are presented make for easy updating, and their modular structure helps pieces of evidence 'move' to other policy areas
- it enables senior management to take a rapid overview of the evidence base, allowing them to set ad-hoc requests from Ministers in context of what is known

The **high level policy narrative** refers to the document currently being drafted to provide an overall picture of SCP policy. The proposed **high level evidence strategy** would include a description of the current and proposed evidence base, and an action and resourcing plan showing how this will be achieved. Several **policy narratives** have been prepared such as the Milk & Dairy Roadmap and the CEMEP report. The Milk & Dairy Roadmap has an **evidence narrative**: a complementary formulation is the draft evidence narrative prepared by the Environmental Behaviours Unit. Individual **evidence plans** for these documents could be aggregated to produce a high-level evidence strategy, enabling the SCP&W team to take a horizontal look across the entire evidence base. The Milk & Dairy Roadmap is a good example of evidence-based policymaking. It is supported by a documented evidence base, a stakeholder group committed to updating the evidence base in future and a budget. It sets out targets, current levels and actions to reach the targets. It could be bolstered by the production of evidence plans which would exert a more transparent demand-pull on research programmes.

The important first step is to decide the reach of this structure for the evidence base. The Waste Evidence programme's reshaping has brought it closer to the SCP approach, but the balance of a fully merged programme and budgets still needs to be considered in the context of improving the functional links between evidence & policy.

### **Recommendation 2: Adding value to research projects' final reports.**

The proposed structure details what would happen to evidence once it has been received by policy teams. However, I believe it is possible to add considerable value to Defra's investment in research by changing the way that project reports are received:

- making it a requirement to produce a policy-relevant report **after** the final technical report has been peer reviewed, consisting of a 25-side report and 3-side executive summary using a free format but clear writing guidelines. Defra's current guidance on producing a final report (SID5) works well for natural science research projects, but not for policy-relevant research or projects which mix research with consultancy
- creating two-side 'Policy Perspectives' from current or previously-completed research, using a format already trialled within the SCP and Waste evidence teams

This approach would allow people to decide the level of detail they needed, would address policymakers' demands for short, policy-relevant pieces of information, and would provide a clear evidence trail.

### **Recommendation 3: The SCP and Waste Evidence teams currently focus on research management. This is necessary, but insufficient for the purposes of an evidence-based approach to SCP&W policy.**

The SCP&W evidence base teams comprise a mix of skills including experience of SCP policy and strategy, research management, programme management, administration and academic/industrial expertise. The balance of activities is currently too heavily weighted towards project administration. Little time is spent taking a strategic view of the implications of existing evidence for SCP policy goals, what constitutes progress towards those goals, the evidence needed in order to be able to measure progress, how those needs will be met and with whose budget. Without a clear structure to the evidence



base, it will be difficult to clarify the balance of requirements and to work out the appropriate team structure and composition. The table below details what would be needed to support the structure proposed above:

- The teams are currently wasting valuable technical expertise on project administration. Contracting out the straightforward parts of the project procurement process would let them take a strategic overview of the evidence base, produce the high-level evidence narrative and accompanying evidence strategy, and take the lead on interpreting emerging evidence for policy teams in Defra and other Departments.
- In the long run the Waste component of the evidence team could embed the SCP model of full-time research managers with technical expertise. SCP research managers value the time they are able to spend taking policy questions out to academia and industry, and bringing ideas and emerging evidence into policy

### Suggested composition of the SCP and Waste evidence teams

Needs	Activities
Strategy & programme management, overall knowledge management	Overarching governance & co-ordination, ambassador for evidence base, production of evidence strategy, intensive dissemination of key documents (particularly controversial results). General programme and team management, linking to other evidence bases in Defra, other Departments and externally. Overall direction of knowledge management work: evaluation of new approach
Knowledge broker: cross-domain 'spanner'	Building & managing cross-domain networks & relationships; internally and externally. Overview of linked evidence bases within Defra and other Departments. Development of improved tools for evidence-based processes
Research / theme managers: within-domain synthesisers	Technical support & networks to evidence bases, co-ordination with policy teams to scope evidence questions, project specification and letting, quality assurance, production of Policy Perspectives. Outward face of SCP&W evidence bases to academia & industry
Technical expertise	Technical expertise brought in for specific issues, as required
Administration	Defra systems: dissemination, website, project & programme admin. support

A dedicated knowledge broker should be brought in for an initial period to kickstart the approach. S/he would focus on building networks, linking evidence bases across Defra, other Departments and other organizations, facilitating the application of tools in support of this approach and developing new tools as necessary.

### **Recommendation 4: Implementing Defra's approach to evidence-based policymaking requires new tools which help scope, assemble, procure and interpret evidence for policy. This report proposes a modular suite of tools for managing the evidence base.**

New tools have been developed for SCP&W which support the functional relationship between evidence and policy and the structure proposed above:

- Scoping the evidence base: *Lines of Argument and Matrix Mapping*
- Improving the dissemination of research: *3:25 structure for project reports*
- Improving the policy-relevance of research outputs: *Policy Perspectives*

The only additional cost of implementing this new approach comes from producing two-side *Policy Perspectives* to improve the uptake of evidence by policy teams. Following interviews with external research providers, I estimate these will add £2,500 to the overall budget for each research contract where they are produced. Both teams identified several reports which they would like to revisit to produce *Policy Perspectives*: a similar amount should be set aside for each of those.





## 1. Introduction

### 1.1 Background and approach

This report is a synthesis of two consultancy projects I have conducted in the past five years with Defra's Science Strategy, and SCP & Waste (SC&W) evidence teams, to answer the questions:

- **What is an evidence base for policy?**
- **How can the SCP evidence base be managed cost-effectively?**

Both projects have been concerned with different aspects of evidence-based policymaking. Reviews of the international literature on this topic have been part of both projects, although as a consultant my focus has been on identifying what is useful to a particular problem, rather than providing broad academic analyses. In the main, this report is based on my judgement of what is likely to work for the SCP&W evidence teams, though the evidence trail can be followed via square-bracketed references in the text, which refer to the annotated bibliography in Annex A2.

Because of the time spent with these two teams, this report is aiming at a moving target. Many of the issues outlined are already under discussion and informing the ways the SCP&W team works. While there is an emerging international literature on knowledge brokering, this is the first time that it has been systematically embedded within Defra, and possibly within any UK Government Department. This means that the approach is still evolving, as are the metrics by which we can judge how well it works. The emphasis throughout this report, then, is on linking theory to practice. It is not a traditional research report in that it presents a modular series of practical tools, and detailed instructions on how to use them. It is not a traditional consultancy report in that it stresses the theoretical grounding on which the tools are based.

### 1.2 Structure of the report

Section 2 describes the important characteristics of the evidence base for SCP and Waste policy, looking at the issues policymakers face as they source and use evidence and the way the evidence teams currently work.

Section 3 explores in more detail the lack of connection between the theory and practice of evidence-based policymaking, showing how and why the Defra framework was constructed. This theoretical background frames the rest of the report, setting out a structure which will improve the functional relationship between evidence and policy; and outlining the key actions a knowledge brokering approach will need to take to support this structure and the skills a knowledge broker needs to possess.

Implementing a knowledge brokering approach to evidence-based policymaking requires new ways of working. Section 5 describes these in overview; and annexes to the report provide the very detailed tools that knowledge brokers would use to implement them. Section 6 outlines a suggested team structure for this new approach. Annexes to the report provide much of the technical information on which the analysis is based. The main conclusions of this report are outlined in the executive summary. Detailed conclusions and suggested actions are given at the end of the report.

## 2. Key issues for the SCP & Waste evidence base

SCP is one of four priorities for action set out in the UK's strategy for Sustainable Development, *Securing the Future*. SCP policy requires a major shift to delivering new products & services with lower environmental impacts across their lifecycles, new business models which meet this challenge while fostering economic competitiveness, and new approaches to encouraging consumer behaviour change. The component parts of SCP policy were not new, but by meshing them together and elevating SCP to a strategic priority Defra set out an ambitious and influential new programme of work. This has continued as the integrated product policy approach has encouraged a closer relationship between SCP and Waste policy areas.

### 2.1 Current arrangements for managing the SCP & Waste evidence bases

The different arrangements currently in place for managing the SCP and Waste evidence bases are partly based in history and partly on the different types of evidence they have commissioned. The SCP evidence base was brought into existence after SCP was elevated to a policy priority, in 2004. It has always conceived of its role as a synthesiser and interpreter of existing evidence within an SCP / lifecycle approach to a product-centred policy programme (Coulton, pers. comm.) By its nature, the SCP evidence base has had to look across policy areas within Defra and other Departments and across disciplines.

The waste evidence base, constituted in 2003 as a research programme, has been more focused on the waste and resource lifecycle of the seven priority materials outlined in the Waste Strategy. The recent Waste & Resources Evidence Strategy intentionally moved away from a 'scientific research' approach to an 'evidence-based approach [12]. This move is compatible with the way in which evidence needs were identified for SCP [14], and it makes sense to continue to integrate the evidence bases for SCP and Waste to provide evidence across the entire lifecycle of products and services. Materials and behaviour change are two areas where there are significant synergies between SCP and Waste evidence, and there are already ongoing initiatives in both areas.

The main difference between the two teams is the extent to which project management is contracted out. SCP's technical experts in products and materials scope researchable questions with policy teams and also provide project specification and management. In Waste the scoping function is provided by theme managers while project management is contracted out. Both research managers and theme managers help interpret research results for immediate policy clients and to the wider stakeholder base.

Both teams make use of statisticians, economists and social scientists dedicated to the SCP&W policy areas, to provide advice on the content and quality of the evidence bases, and for management and quality assurance on individual projects. Projects are also quality assured by steering groups, drawn from policy and academia. A standing expert advisory group was convened in the early years of the SCP evidence base to provide strategic advice. It was intentionally time-limited and has since been disbanded. The Waste & Resources Research Advisory Group was set up to advise production of the Waste & Resources Evidence Strategy, but has been stepped down while various options are considered. Project steering groups provide expert advice to some individual projects, but there is no standing expert advisory group. As will be seen later, this is not necessarily a problem.

### 2.2 Evidence for SCP policy: its characteristics & resulting challenges

The main characteristic of evidence for SCP&W policy is that it crosses traditional boundaries, in several ways. First, the lifecycle analysis which is central to the SCP&W

approach crosses academic disciplines. Second, the globalised nature of production and consumption means that evidence for SCP&W policy crosses national boundaries. Third, the evidence is often held by policy areas elsewhere in Government (including across Defra). Fourth, SCP&W policy and thus SCP&W evidence is multisectoral, involving stakeholders in industry, academia, the voluntary sector and Government. Finally, SCP is largely an influencing rather than a delivery programme. A key role of the SCP&W evidence base is to determine whether current Government policies are sufficient to deliver against the full SCP&W agenda, or whether other policy instruments are needed [14].

The emphasis on evidence-based policymaking has encouraged a greater focus on what constitutes high-quality evidence [11, 12, 13, 14, 22, 29, 34, 39, 43, 44, 45, 61]. However, the phrase itself tends to support the assumption that decisions ought to flow directly and clearly from the evidence (Boaz, pers. comm.) The issue for the SCP&W evidence base is not simply “what works?” Instead it is a mixture of questions: how it works, why it works, for whom it works, whether it will work in another time or place, who determines how progress towards ‘it works’ should be measured, and whether it has worked cost-effectively. Different stakeholders will have different views on the answers to these questions, which gives rise to evidence which is plural (multiple points of view on a single piece of evidence) and conditional (dependent on the context within which the evidence is used) [66].

It is difficult for academia to keep pace with policy needs for this type of evidence, such as lifecycle analysis and evidence of the international effects of UK policies (Coulton, pers. comm.) There are an increasing number of people specialising in these broad issues, and a growing number of organisations and networks able to put together teams of people who can provide the total skill set needed, but demand from policy currently outstrips supply (*ibid.*).

While the quality assurance systems used by the SCP&W evidence teams cover all the issues set out in Government guidelines for procurement of scientific advice [40], this does not mean that the evidence procured is necessarily used by policymakers. Policymakers interviewed for this project admit that there can be some inconsistency in the way that they search for, and interpret the evidence base. They observed that research reports are often not written in ways that make them easily digestible by people who are not technical specialists. They also noted that researchers are often not well-enough informed about the current policy environment to be able to answer the questions that policymakers have asked.

Research management techniques alone are insufficient for managing an evidence base of this boundary-spanning complexity. Interviewees also suggested that:

- The length of reports means that it is difficult for people moving into a new policy area to rapidly assimilate the evidence they need
- Lengthy reports may not be read in their entirety: either the evidence is drawn from the executive summary or pieces of evidence are picked from the body of the report
- Those reports which do meet the needs of policymakers, are accessible to non-technical specialists, and are easily readable; tend to be used as ‘crutches’: Policymakers default to these preferred reports when they find others inaccessible
- Policymakers do use the internet to search for evidence. However without a clear sense of direction there is a risk that the search becomes random very quickly: the internet is organised by those who produce the information, not those who need to use it

The net effect is that SCP policymakers risk searching unsystematically in an evidence base that is neither organised, nor signposted, for policy application. As a result, they might extract key pieces of evidence from over-long reports without fully understanding

the context; or rely on a small number of well-written reports without necessarily appreciating potential challenges to, and alternative interpretations of, the evidence. This is not an unthinking reaction to complex problems but a necessary response to time pressures in a fast-moving work environment. Policymakers are aware that this represents a degree of system failure.

The above analysis emphasises how important it is to ensure that the processes of sourcing and using the evidence are as robust as the evidence itself. The next section builds on this, tracing the development of Defra's framework for evidence-based policymaking and, the emergence of a knowledge brokering approach.

### 3. From evidence-based policymaking to knowledge brokering

#### 3.1 'Evidence-based policymaking': theory ≠ practice

The phrase 'evidence-based policymaking' grew out of work in the health sector to encourage policy to use evidence based on random controlled trials and other statistically robust techniques. While there has been a concern with the use of evidence in policy since the 1950s, the *Modernising Government* White Paper [28] provided the impetus to embed the phrase across British policymaking, including the environmental policy arena [23].

Over the past ten years the focus of the international literature has shifted from improving the supply of robust evidence to policy, to understanding what conditions the demand for evidence by policymakers, and how they subsequently use it to formulate options [14, 17, 20, 25, 27, 33, 36, 43, 46, 47]. There have been many analyses of how evidence has (or has not) been used to help formulate policy options (see [13] for a summary), but the academic literature contains few practical suggestions for what exactly policymakers should do to improve it.

Defra's Evidence & Innovation Strategy brought out one of the frustrations of trying to implement an evidence-based approach to policymaking from within: the lack of attention paid in the literature to the three main drivers shaping policy making processes in the UK. These are: the nine core competencies set out in *Professional Policymaking for the 21<sup>st</sup> Century* [27], the *Professional Skills for Government* agenda [31], and the Cabinet Secretary-instigated *Capability Reviews* [30]. The first sets out the behaviours expected of policymakers, the second describes a set of skills they need to acquire for career progression, the third outlines how Departments should equip themselves with the team and organisational skills needed to meet current and future challenges.

Departments necessarily apply these three frameworks in different ways, depending on their resource base, on the particular challenges facing them and on organisational custom and practice [22]. Because of this, there is no right answer to the questions of (e.g.) whether disciplinary analysts should be embedded within policy teams, the extent to which research should be contracted out or managed internally, or how to build relationships with delivery partners. The net effect is not a unitary policy process, but a set of processes that can be best described as a cottage industry (Donald Macrae, pers. comm..)

In 2003 Defra's Science Strategy Team were charged with implementing an evidence-based approach to policymaking. Unable to find practical tools for this, they went back to first principles, spending time understanding the role of the policymaker, the definition of 'robust evidence for policy', the principles of knowledge management within large & complex organisations, and how this all translates into a more effective relationship between the supply of, and demand for, evidence in policy. This is outlined next.

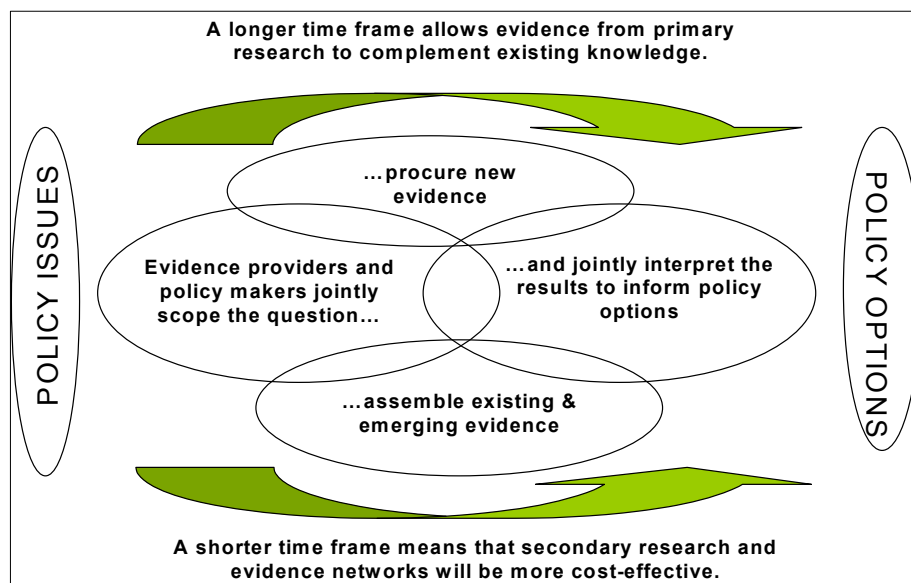
#### 3.2 The history of Defra's framing of evidence-based policymaking

Defra's Evidence & Innovation Strategy (E&IS) set out to respond to the changing nature of environmental policymaking by asking two linked questions. First, how can we ensure that Defra's considerable resource base can deliver, cost-effectively, our strategic objectives and other policy priorities? Second, what practical tools are needed to implement an evidence-based approach to policymaking?

A report by Tony Taig in 2004 - *The development and use of scientific advice in Defra* [1] – showed that Defra needed to strengthen links between evidence providers and policymakers to support policy's needs for evidence to support long-term strategy, policy

development and policy delivery. Based on Taig’s analysis, the E&IS identified four processes for evidence-based policymaking. These were: scoping the question (using evidence for target setting, outcome identification, understanding distributional aspects); procuring new evidence from primary research (long-term studies, evaluations, monitoring data); reviewing and assembling existing or emerging evidence before commissioning new evidence; and interpreting evidence from multiple sources.

These processes are encapsulated in the ‘Defra’ framing of evidence-based policy making. It demonstrates that the quality of the processes of sourcing and interpreting evidence are fundamental to evidence-based policymaking. The Defra framing is described in more detail in *Our Approach to Evidence and Innovation* [5] and was implicitly supported by Recommendations 3, 4, 5, 6 and 8 of the End to End Review by Defra’s Science Advisory Council [6]. It is supported by guidance about how to negotiate the [five criteria of robustness](#) in the evidence base [2].



**Fig 1: Defra’s framework for evidence-based policymaking. From Defra, 2006, *Our Approach to Evidence & Innovation* [5]**

Defra has paid considerable attention to the top oval in its research and data collection programmes. Quality assurance for these activities is well developed in the form of guidance on procurement and commissioning processes in Defra’s Science Handbook. This in turn has drawn from the Government Chief Scientific Adviser’s guidelines, Guidelines 2000 [14] and its updates. However, the Taig report demonstrated that there needs to be a corresponding emphasis on how well policy questions are scoped and how well the entire evidence base is interpreted to inform current policy debates.

As part of a pilot project for the E&IS, work on the SCP evidence base looked more deeply into these processes. We concluded that for SCP evidence in particular, it was not simply about getting the procurement processes right. Much more time needed to be spent assembling and interpreting the large amount of existing evidence relating to SCP policy concerns. A report by the Ashridge Centre for Business & Society emphasised the need for a relational approach to managing the SCP evidence base (see Ashridge, 2006). Combined with work by IBM on using WebFountain to sense emerging evidence needs, the Ashridge report ultimately led to the knowledge brokering approach outlined here.



### 3.3 Developing a structure for an evidence-based approach to policymaking

The four functions of evidence-based policymaking show why it is important to look at how evidence is sourced and used in policy development, as well as what that evidence is. Guidelines on how to procure scientific advice [40] mean we can assess how well we procure evidence, but there is no similar guidance ensuring that we do a good job of understanding what evidence to procure and how it is used in policymaking, and subsequently how we can deliver additional value to Defra's investments in research and other evidence gathering methods.

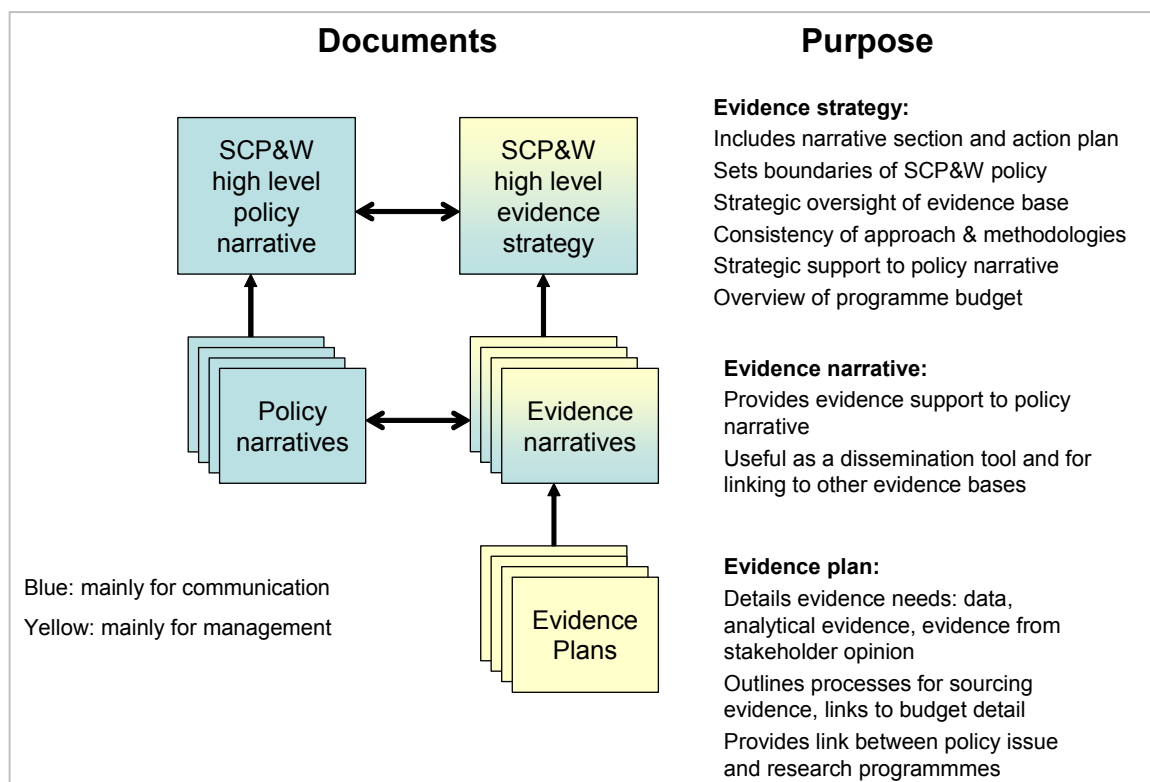
A clear structure for the evidence base would help clarify this relationship between 'what' and 'how', and build a functional relationship between evidence and policy. The SCP and Waste evidence bases work to two strategic documents: one published and one unpublished. As the products and materials approach narrows the gap between the two evidence bases, a single coherent structure would provide a focal point which drives all evidence-related activities. There are currently many different mid-level foci for evidence including the Roadmaps, the Waste & Resources Evidence Strategy, the work on Environmental Behaviours, and projects related to specific policy issues. This relatively ad-hoc approach means that while individual policy needs for evidence may be satisfied, there is nothing which shows how these add up to an overall picture of the SCP evidence base.

Several interviewees were unclear of the relative importance of the different policy areas and, consequently, the relative 'pull' they had on the evidence base for SCP. For example, the Sustainable Products and Materials programme currently has 8 workstreams including work on tools & methods for SCP, the products road maps, and Energy Using Products. Without a clear structure it will be difficult to see how – say, within the roadmaps workstream - work on construction waste is prioritised in relation to studies on textiles. And some people, both inside and outside Defra, believe evidence relating to business behaviour is given a lower priority than evidence for products and materials policy; but are unclear whether this is actually the case and if so, why.

The diagram in Figure 2 below sets out a proposed structure for the evidence base, clearly linking policy and evidence. This is not a single document, but a cascade structured around a series of smaller, policy-related evidence strategies. It is based on examples of current good practice in evidence-based policymaking within SCP and Waste:

- Policy narratives – the *Milk & Dairy Roadmap*, which is based both on a thorough review of the evidence, a commitment to keeping this evidence base updated, a well defined stakeholder group and a budget (see Box 1)
- Evidence narratives – the evidence section of the *Milk & Dairy Roadmap*; and the *draft evidence narrative for environmental behaviours*, designed as a modular set of PowerPoint slides. It draws from the *Environmental Behaviours Framework* report which summarised Defra's understanding at the end of 2007, but which enables new evidence to be slotted in as it emerges.
- The *action plans* being developed by the Waste theme managers
- Short research reports – there are several examples of good practice here including the five research reports on *public understanding of sustainable behaviours* which have been summarised into two-side documents (see section 4); the *food waste focus project*, the project on *impacts of lifestyle changes on waste arisings*. All are well-written short reports containing policy-relevant information rather than simply research recommendations and which have been 'brokered' by the theme / research managers in both evidence teams. This '3:25' approach is detailed in section 4.





**Fig 2: Developing a structure for evidence-based policymaking**

The structure is modular and therefore flexible, enabling large policy areas to absorb and desorb individual issues as they arise and fade. It should help senior management take a birds-eye view of the relationship between evidence and policy for large policy areas, encouraging a real demand-pull on the evidence base from the top downwards. (This would be helped greatly by regular discussions of all the evidence at senior management meetings). It is also designed so that updates in one area trigger updates elsewhere in the system; the updates emerging via short policy-relevant summaries of research and other evidence as Policy Perspectives (described in section 4). Linking the evidence base to policy in this way makes it clear how evidence which is broadly robust [2] provides rigorous challenge to policy's goals and current direction of travel.

Developing a structure of linked evidence 'products' means that there needs to be a real focus on the processes by which they are produced, which needs to be achieved by 'funding the arrows, not just the boxes' [17]. Obviously, there is a danger that the horizontal links do not work well, and that the relationship between evidence and policy returns to business as usual. However there is a clear commitment in both evidence teams to finding a system which responds effectively to policymakers' questions while challenging them to take a broader view of what is emerging from the evidence base.

Box 1 contrasts two recent examples to illustrate how policy narratives and evidence narratives can be linked:

**Box 1: A functional relationship between evidence and policy - contrasting the CEMEP report with the Milk & Dairy Roadmap**

The CEMEP report was instigated following a Ministerial request to draw together a high-level Commission to provide insight into future policies on environmental markets. Ministers set a tight timetable, which meant that the team was unable to procure secondary review evidence to form the nucleus of an evidence base. The report has been well received by Government and as a high-level summary it sets the framework within which policymakers act on business issues. However, further consideration now needs to be given to defining a stakeholder group, a budget, and commitment to measure and monitor progress against objectives.

In contrast, the Milk & Dairy Roadmap is an important part of the work of the SCP evidence base, supporting the products approach. The report is well supported by an evidence base (a review of the literature, including models); there is a clear commitment to keeping this up to date and a defined stakeholder group with a budget. The Roadmap approach demonstrates a functional relationship between policy narrative and evidence narrative, with updates in the evidence base triggering updates in the narrative. Even the Roadmap, though, would benefit from a clear evidence strategy to flesh out the information contained in the 'How?' 'Measure' and 'Limitations' columns in the Roadmap's Table 8. In particular, it would detail the outcome indicators, indicators of progress, the analytical evidence needed to set data and research in context, an indication of where the evidence would come from (Defra / Industry / Academia / Cross-sectoral networks) and which budgets would be used (Defra / Industry / Research Council / International).

This structure proposed in Fig 2 illustrates why research management may be a necessary part of providing cost-effective evidence to policy, but is insufficient on its own. The scoping, assembling and interpreting functions in the Defra framework will be key to maintaining the flow of evidence between research and policy. The international literature refers to these activities collectively as the 'knowledge brokering' function, which is examined in more detail in the next section.

### 3.4 What is knowledge brokering for policy?

A knowledge broker is an individual or organisation who plays an active role in sourcing and interpreting information, spanning domains of knowledge to bring insights. In the policy context, the role of a knowledge broker is to facilitate the exchange of information between policy teams and the organisations which provide all the types of evidence policy needs. The main role of any knowledge broker (person or institution) is to communicate knowledge between two worlds; translating and repackaging information to meet user needs, communicating evidence needs from policy to evidence suppliers, and providing a neutral forum for debate which builds a more trusting relationship and protects each side from accusations of bias. The question is, though – do knowledge brokers work best when they sit inside, or outside the policy environment?

There are many organisations with the mandate to improve dialogue between research and policy – including include think-tanks, expert advisory committees, networks and consultancy organisations. All perform some or all of these roles simultaneously. Three organisations at the forefront of knowledge brokering in this way are the [Canadian Health Services Research Foundation](#), [Land & Water Australia](#), and [The Key](#) – a UK initiative providing support to school leaders. The advantages and disadvantages if different types of organisational relationship are shown below:

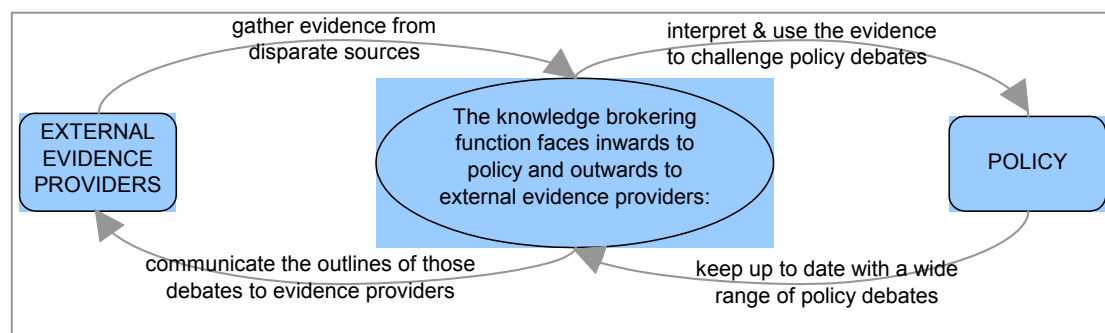
Organisational relationship	Advantages	Potential disadvantages
Wholly external organisation with dedicated funding	Independence, track record, ability to sub-contract as needed	High sunk costs, difficult for them to change track rapidly in response to new policy needs for evidence
Network (e.g. Research Network) with mandate to do short-term work	Flexibility, able to pick up on new issues quickly	Looser affiliation may mean that particular interests are not represented
Call-off contract	'Consultancy' approach, rapid response	Several may be needed across the programme: high admin costs
Standing expert advisory committee	Engagement with experts in the field: high quality advice	Bureaucratic to administer. Roster of suitable experts may be hard to maintain if policy needs change

**Table 1: advantages and disadvantages of dedicated external brokering organisations**

The main issue for all external brokering organisations is the extent to which they can keep up with the very rapidly-changing policy environment and whether they can influence how receptive the policy environment is to that evidence. I am convinced that however competent an external organisation is at translating and communicating evidence, the key people are unlikely to be in the right meeting at the right time to interpret the relevant evidence with the policy client who really needs it. It is only internal (staff) people who will be able to respond at short notice and do the sort of focused interpretation work needed to embed evidence, particularly from controversial reports.

Policy analysts are called upon to perform this brokering function, and the experienced facilitators at Defra's Innovation Centre in Reading are able to run projects which broker particular relationships between research and policy. In response to some of the work that preceded this report, several people in the evidence team are already acting as knowledge brokers as in figure 3:

- Working with policy teams & project steering groups to scope evidence questions
- Working with evidence providers and policy colleagues to interpret evidence for current policy issues (the 3:25 report structure and Policy Perspectives - see later)
- Intensively disseminating key reports to others in Defra and outside
- Visiting external stakeholders to communicate current policy thinking and build a sense of where academia is heading on important issues



**Fig 3: Activities of an internal knowledge brokering function.**

However it is worth considering whether a dedicated knowledge broker should be hired to kickstart the approach - if the SCP and Waste evidence bases are to provide systematic support to wider Defra policy, then policy analysts and the rest of the evidence team need more systematic support themselves. Interviewees for this project would like to see the evidence team:

- Take a strategic view of SCP evidence base, understanding how it can be interpreted to keep SCP policy debates up to date; how existing and emerging evidence challenge current policy goals
- Link evidence bases within Defra, helping policy colleagues in Defra and other Departments to interpret SCP evidence to inform policy debates
- Communicate outwards to evidence providers and the rest of SCP's stakeholder base (business, academia, NGOs, EU and international bodies) to clarify the current shape of policy debate, update them about emerging priorities and debate the sorts of evidence that might be needed in future
- Look across the full range of evidence provision including evidence of different types (horizon scanning, statistics, disciplinary policy analysis, stakeholder engagement exercises) and from disparate sources (business, NGOs, other Departments, Local Authorities, regional bodies, international networks including the Marrakech Process)
- Build capacity to work on presenting and disseminating the evidence, particularly for controversial or important reports. For the shopping trolley and EIPRO reports, team

members spent a good deal of time over several months to take the work out to key audiences in Defra and beyond, working through the implications of the evidence. Even well-presented reports need more than a launch event: it is the **process** of working through the implications of the evidence that is important [65].

- Manage expert advice at a more distributed level. Interviewees felt that there was no real need for a standing team: that project steering groups were able to provide a good quality assurance function and could be brought together periodically to reflect on the broad strategy for SCP and identify gaps that need filling.

While the structure outlined in Fig 2 is intended to facilitate this, there are several issues that need to be addressed. First, management of the evidence base is largely focused on programme and project administration which is overly bureaucratic and burdensome. The procuring function does not, in itself, create bridges between evidence and policy: much of it could be contracted out without losing the ‘intelligent customer’ activities of scoping, assembling and interpreting evidence. Some light touch management would be needed by the SCP&W evidence team, but the bulk of procurement activities could be done by an external organisation.

Doing this would free up a considerable amount of specialist time which could be better focused on the activities which do build bridges between evidence and policy: the scoping, assembling and interpreting functions. Although the team is developing a good collective knowledge about the evidence for SCP&W policy, people are unable to spend enough time with their immediate policy colleagues to help interpret evidence for current policy priorities – and even less time with policymakers outside the immediate SCP team. They also have no time to take a strategic overview of the implications of the evidence base for SCP policy goals, how SCP evidence links with other Departmental evidence bases or how different stakeholders view the implications of the evidence.

The suggested team structure and composition is given in Table 3.

Needs	Activities
Strategy & programme management, overall knowledge management	Overarching governance & co-ordination, ambassador for evidence base, production of evidence strategy, intensive dissemination of key documents (particularly controversial results). General programme management, team management, linking to other evidence bases in Defra, other Departments and externally. Overall direction of knowledge management work: evaluation of new approach
Knowledge broker: cross-domain ‘spanner’	Building & managing cross-domain networks & relationships; internally and externally. Overview of linked evidence bases within Defra and other Departments. Development & utilisation of improved tools for evidence-based processes
Research / theme managers: within-domain synthesisers	Technical support & networks to evidence bases, co-ordination with policy teams to scope evidence questions, project specification and letting, quality assurance, production of Policy Perspectives. Outward face of SCP&W evidence bases to academia & industry
Technical expertise	Technical expertise brought in for specific issues, as required
Administration	Defra systems: dissemination, website, project & programme administrative support

**Table 3: Suggested composition of the SCP and Waste evidence team**

### 3.5 Key attributes of a knowledge broker

A key aspect of knowledge brokering is the ability to interpret complex pieces of evidence for a particular purpose – in this case, policy development. However, a knowledge broker is not someone who provides a direct translation from one terminology to another within a single domain of knowledge (such as summarising and simplifying

complex economic evidence). Nor is it someone who seeks to exert leadership over a complex process. While a policy analyst is more likely to synthesise knowledge within a domain, a knowledge broker is a boundary spanner; looking across knowledge domains and bringing a particular set of skills to facilitate and manage relationships within the team and between the team and external stakeholders. An important aspect of knowledge brokering is identifying when to create new relationships and new tools.

To be able to build relationships a knowledge broker must be credible to both the providers and the users of evidence. They need to be comfortable working with different types of evidence from a variety of sources and across the different disciplines; able to understand qualitative and quantitative data and the uses of different types of evidence in policy. They also need to be information magpies, able to pick out salient points from a wide literature and grasp their potential application. Sarah Michaels at the University of Nebraska (pers. comm.) notes that there are various strategies knowledge brokers can employ to get the right combination of people to focus on an issue at the right time: they can inform, consult, matchmake, engage, collaborate and build capacity. Strategies can be used singly or together: matching the combination to the purpose is a matter of judgement and experience.

Skills needed	Personal characteristics
<p><u>Facilitator</u>: has a range of workshop and meeting facilitation skills at his/her fingertips and is able to devise new methods as necessary to deliver the particular outcome needed. Able to handle disagreements and challenges. Does not try to force artificial consensus where none exists.</p>	<ul style="list-style-type: none"> <li>• Proven facilitation skills: able to devise and run complex workshops of any size on controversial issues. Has a good understanding of knowledge management: is able to use this to identify where new workshop tools may be needed and work with rest of the team to devise them</li> <li>• Creative, imaginative, innovative. Able to hand over responsibility to others clearly and completely and move onto other projects</li> <li>• Has the personal and facilitation skills to handle disagreements within meetings, encourage and explore diverse views, and capture these without causing conflict</li> <li>• Not necessarily a completer-finisher: happy to work through disagreements over time and even leave them open, rather than seeking to impose consensus</li> </ul>
<p><u>Relationship manager</u>: able to work with other team members to develop a large, inter-disciplinary and cross-sectoral network of contacts and to understand how best to involve the right people at the right time for any particular issue.</p>	<ul style="list-style-type: none"> <li>• Self-starter, extrovert, enthusiastic. Able to spot potentially fruitful relationships and work out how best to foster them</li> <li>• Understanding of knowledge management in large organisations and how to constitute an effective team</li> <li>• Ability to work very closely within a team: leading its workings without leading it to unwarranted conclusions</li> <li>• Understands partnership working</li> </ul>
<p><u>Interpreter</u>: able to translate and repackage information from a variety of sources for a particular purpose</p>	<ul style="list-style-type: none"> <li>• Interdisciplinary background</li> <li>• Good writing skills, with experience of the brevity of policy papers</li> <li>• More synthetic than analytic types of thought processes</li> </ul>
<p><u>Academic credibility</u>: a sufficient subject knowledge and academic experience of the broad issue to be able to attend research seminars, ask methodological questions and comment on draft reports.</p>	<ul style="list-style-type: none"> <li>• Masters' level degree, broad experience in a variety of positions</li> <li>• Subject matter knowledge would be a help, but the main qualification is the ability to pick up on ideas very rapidly</li> <li>• Ability to take a broad overview: not someone who likes to drill deep into single issues</li> </ul>
<p><u>Policy credibility</u>: a good</p>	<ul style="list-style-type: none"> <li>• Experience of working with policymakers, either directly</li> </ul>



<p>understanding of policy timescales and knowledge of current policy discussions about an issue. Able to use this credibility to catalyse new relationships.</p>	<p>or indirectly</p> <ul style="list-style-type: none"> <li>• Able to work with different types of evidence (horizon scanning &amp; futures, statistics, qualitative and quantitative evidence, evidence from a variety of disciplines)</li> <li>• An understanding of broader science policy issues – even if no formal training in science policy</li> </ul>
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**Table 3: skills for knowledge brokering**

### 3.6 Knowledge brokering and Renew Defra

Renew Defra is a large organizational change programme: the focus of this section is simply on how the knowledge brokering approach fits with internal guidance to policymakers. Renew guidance concentrates on developing the ROAMEF-based cycle for specific policy issues, and does not cover management of the evidence base (ROAMEF: Rationale, Objectives, Appraisal, Monitoring, Evaluation, Feedback). Its portfolio approach is designed to bring a particular skill set to bear on individual policy issues, making best use of the skills and experience available across Defra. In terms of how the evidence base is used, there are two general points:

- First, people moving into a new policy area will need to get up to speed very quickly with the state of the evidence base and what it means for policy goals. At present this can be a haphazard process: the structure proposed in Figure 2 should help systematize this and make it easier to see the links between evidence and policy.
- Second, external evidence providers will find it difficult to determine who they should work with as policy issues change. While the skills contained in the evidence teams may change, the ongoing existence of an evidence team will help maintain contact with external evidence providers.

**Records management** is an important aspect of the evidence base. Internally, Sharepoint will be well able to cope with the needs for good records management but people outside Defra cannot access these internal documents. The risk is that relying on Sharepoint alone contains too much information within Defra. Ideally, an evidence base would include information accessible to different external stakeholders – members of project steering groups, networks, or simply those with an interest. In the long term it could be interactive, allowing a two-way exchange of information. The Sharepoint team are considering developing an outward-facing system, but until this has been tried and tested it may be worthwhile loading some of the evidence onto the Sigma Scan at the Government Office of Science’s Horizon Scanning Unit.

**Quality assurance** is prominent in Renew’s approach to the policy cycle, with analysts playing a greater role as gatekeepers at specific stages. The Defra policy cycle sets out the main points at which policy teams need to seek approval for policies: the evidence they present is a key part of the approval process. This encourages analysts to play a broader role than they have in the past and increases the focus on sourcing good quality evidence for each policy issue.

The structure proposed for the evidence base should help both the monitoring and the evaluation aspects of this quality assurance process. First, it should make it easier to rapidly source the evidence needed for any evaluative gateway reviews of the evidence base led by Defra’s Chief Economist and Chief Scientific Adviser. Second, the structure was designed so that senior management could rapidly assess the robustness of the evidence base as part of their ongoing monitoring of policy areas.

Having said that, the rationalist approach to policymaking implied by a ROAMEF-type cycle may not be applicable to many of the complex policy issues which characterize the SCP evidence base [64].

### 3.7 Evaluating the contribution of a knowledge brokering approach to cost-effective management of the evidence base

While there is a growing theoretical literature on the benefits of knowledge brokering and boundary spanning, one of the weaknesses in the current evidence base is that we do not know how effective these strategies are (Boaz, pers. comm.): there is no standard template for monitoring or evaluating progress in evidence-based policymaking. The extensive literature review conducted for SCP&W on assessing the impact of research on policy [13] implies that there are no agreed metrics for evaluating the contribution of a knowledge brokering approach to policymaking, or for monitoring the additional contribution an individual broker makes to an overall brokering approach.

To evaluate the impact of the structure and approach proposed here, we need to be careful to recognize that we have to limit the assessment to whether knowledge brokering improves the *process* of developing policy: we cannot yet assess its contribution to delivering a better policy outcome.

However, one of the important first tasks for the SCP&W evidence team will be to understand whether this approach really is a cost-effective way of managing the evidence base by defining measures of success. Since ‘effectiveness’ relates to how knowledge brokering improves the relationship between supply of and demand for evidence for policy, I suggest focusing in three areas. First, the approach needs to stimulate demand for evidence from policymakers at all levels. Second, it needs to ensure that that the supply of evidence is policy-relevant and third, there needs to be an assessment of how well the dedicated knowledge brokering function oils the gears between evidence and policy:

Stimulating the demand for evidence by policymakers	<ul style="list-style-type: none"> <li>• The regular use of Policy Perspectives at senior management meetings</li> <li>• Regular senior management oversight of the entire evidence base, linked to updated policy narrative documents</li> <li>• Policy teams in SCP, wider Defra and other Departments use the Policy Perspectives produced by the SCP&amp;W evidence team</li> </ul>
Ensuring that the supply of evidence is policy-relevant	<ul style="list-style-type: none"> <li>• The relative emphasis given to the tools suggested in this report – the 3:25 report structure, policy narratives / evidence narratives, Policy Perspectives</li> <li>• The amount of time spent by the evidence team on scoping, assembling and interpreting evidence for policy, as opposed to simply procuring research</li> </ul>
Assessing whether the system works effectively	<ul style="list-style-type: none"> <li>• The brokering approach and tools spread beyond SCP&amp;W</li> <li>• The SCP&amp;W evidence base team structure is stable over time</li> <li>• Demand for support from the knowledge broker and wider SCP&amp;W evidence team in contentious or complex policy issues</li> </ul>

**Table 4: Outline for monitoring and evaluating the cost-effectiveness of a knowledge brokering approach**

The next section outlines some of the tools developed to support a knowledge brokering approach.



## 4. Tools for knowledge brokering

### 4.1 Introduction: the suite of tools

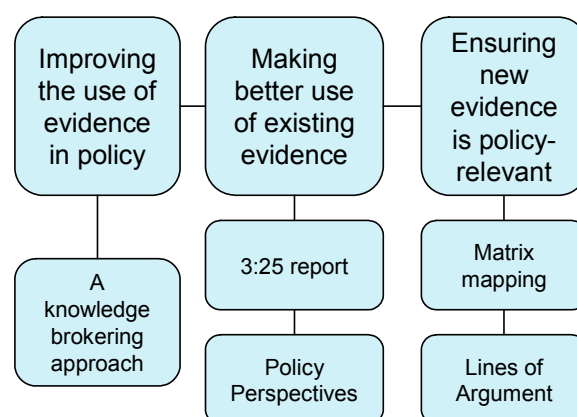
It is clear from the above analysis that a knowledge brokering approach cannot rely on research management alone: it demands skills in network and relationship management, facilitation, interdisciplinary research and expertise with various different types of evidence.

It also needs to be supported by new tools to support the scoping, assembling and interpreting functions in the Defra framework for evidence-based policy making. In a pilot project with the Science Strategy Team and IBM, a new technique was developed to scope the evidence base in a way that directly responded to policy needs. This 'Lines of Argument' tool is outlined in section 5.2.

A set of working practices to support a knowledge brokering approach is proposed in Table 4. These are modular and can be used independently, but taken together form a systematic, rational and widely-engaged approach to knowledge brokering for SCP policy. This is described in detail later in the report, but it is helpful to know the history:

- **Lines of argument** were developed with the SCP evidence base team in 2005-6 to help scope the evidence for SCP policy
- **Matrix maps** were developed in a slightly different format for Defra's Evidence & Innovation Strategy, and used in the format proposed here in another UK Government Department's science planning process. Their purpose is to engage stakeholders in a functional way in planning and prioritizing the evidence base against policy needs
- The **3:25** report structure is based on an approach used for the past decade by the Canadian Health Services Research Foundation. Guidance is given in Annex B1
- **Policy Perspectives** are an adaptation of the full structure used by the CHSRF, designed to improve the policy relevance of research. The process of developing them is designed to encourage a joint exploration of what the new evidence implies for policy.
- **Knowledge brokering** has been developed over the past decade and has an emerging academic literature – as outlined above

An overview of how the tools fit together is shown below and detailed in Table 5:



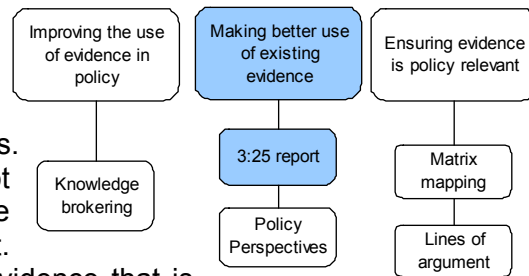
**Figure 4: overview of the approaches proposed in this report.**

**Table 5: Tools for effective knowledge brokering**

Table 5: Tools for effective knowledge brokering							
<b>Policy development issue addressed</b>	Rationale for developing policy in a specific area	Scoping the evidence base: evidence required to inform the rationale for policy	Identifying evidence needs, clustering them into procurable programmes of work	Presenting evidence in a manner which informs policy	Drawing out the policy implications of the evidence presented	Establishing links between evidence base, policy & long-term strategy implications, and policy goals	Stimulating and managing the links between evidence, policy, strategy and policy goals
<b>Suggested tools and approaches</b>				<b><i>Making best use of existing and emerging evidence</i></b>			<b>Knowledge brokering function</b>
	<b><i>Ensuring new evidence is policy-relevant</i></b>						
	<b>Lines of argument</b> exercise and workshop		<b>Matrix mapping</b> workshop	<b>3:25 report</b> structure	Creating <b>Policy Perspectives</b>	A structure for managing the <b>Evidence Base</b>	
<b>How this works (report annexes contain detailed guidance for all tools)</b>	A structured approach to finding policy rationales, working backwards from future goals	Identification of evidence needs based on a structured series of questions	Clustering evidence needs against policy goals as a basis for procurement	An <i>addition</i> to the final technical report which presents evidence in a form accessible to policymakers	Joint interpretation of the evidence by research and policy; summarised in a two-side document	Provides structure to the evidence base and a functional relationship between evidence & policy	The oil in the system: keeps the knowledge flowing around the evidence base
<b>Specifics</b>	Used to scope the evidence base for new policy areas or to reassess evidence needs for existing issues		Generates detail for the high-level evidence strategies & narrative	Adds value to research projects by improving the policy relevance of research reports. Revisits completed projects to ensure that previous work is not lost		Focus of the evidence base team. Drives updates of the high-level policy narrative	Catalyse & support all approaches. Provides facilitation support across evidence team, devising new working practices & relationships

## 4.2 The 3:25 report structure: adding value to research project's final project

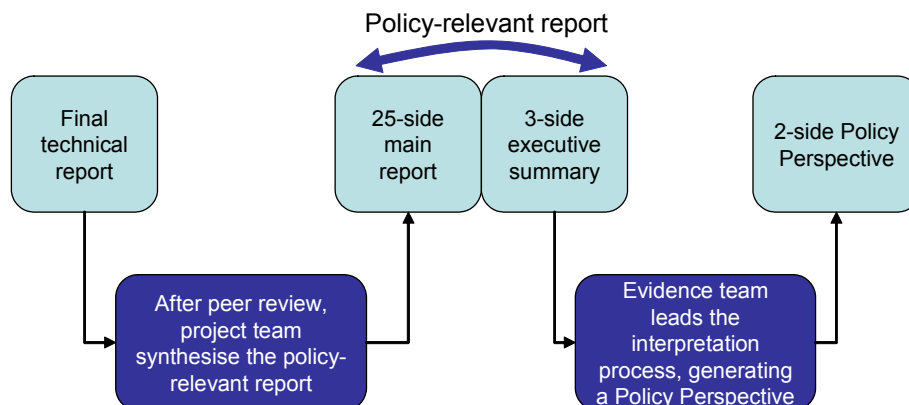
As a first step, the evidence contained in research reports needs to be policy-relevant. This includes ensuring that they address current policy issues, and that they are accessible to non-technical specialists. Making evidence policy-relevant does not compromise its objectivity or the independence of the people providing it. 'Policy-relevant evidence' means impartial evidence that is presented in context and for application to policy: not evidence that has been procured specifically to bolster a particular line of argument.



It is important that proper procedures are in place for ensuring that evidence is as free as possible from bias, but simply having the evidence there does not mean that it will be used. The 'enlightenment function' of research [49] will not happen to any great degree if research reports are not read. And different people will have different needs from the evidence base: some will need technical detail, others a synthesis, and others an outline. However the SID5 final report format, which is required for all Defra-funded projects, resembles a classical natural science research report rather than one designed to present evidence in context and for application – it helps quality assess what is procured, but not how it is interpreted.

To address all the points above, I propose changing the format of SCP&W final project reports to the 3:25 model, adapted from that used by the Canadian Health Services Research Foundation. The process would be as follows (see Fig 5):

- A final technical report is sent out for peer review.
- Once accepted, the project team synthesises the information into the final project deliverable of a 3:25 policy-relevant report
- The main body of this report is restricted to a maximum of 25 sides. Its structure is agreed before the project is commissioned with the SCP evidence base team (guidance on this is given in Annex B).
- The executive summary is limited to three sides, which summarises the main body of the report for non-technical specialists
- The evidence team then decides whether to produce a two-side Policy Perspective (see section 4.3)



**Fig 5: process for producing a 3:25 policy-relevant report, & Policy Perspective**

Different people will be able to access the level and type of detail that suits them: either the Policy Perspective, the executive summary, the main body of the policy-relevant report, or the final technical report. The point is not to impose an unworkable structure but to ensure that different people’s needs for detail can be met simultaneously. So in the case of a very large and complex project, it would be quite possible to produce two 3:25 reports, thinking creatively about the scope and nature of each. There is a growing interest in alternative ways to present evidence than text. Annotated presentations, videos and audio interviews are potentially useful techniques for delivering final report results.

[As an aside, it is worth noting that many projects generate a dataset, but this is often not requested as a project deliverable. The evidence base team should request this as a matter of course: it is important for quality assurance, and so that the evidence base can be updated in future. Datasets that are too large or complex to be maintained in-house need separate arrangements to ensure that they are accessible by Defra statisticians. Call-off contracts might be suitable here.]

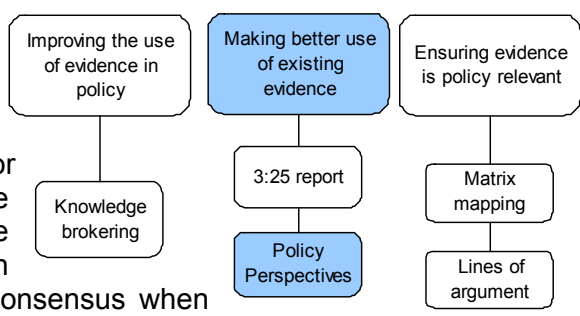
Interviews were conducted for this project with a small sample of evidence providers, who cautiously welcomed this change but would appreciate short workshops to help them understand the changes. They did not raise any real obstacles to implementing the approach. Interviews with evidence users showed quite some enthusiasm: the Waste team noted that they are already beginning to see the benefit of asking contractors to report in this way. Some pointed out that the SID5 form specifies a 2:20 model – but that it is rarely adhered to because it does not meet their needs. Social scientists may need the body of the report to be longer (up to 40 pages) to accommodate the number of direct quotes.

It is not only researchers who need to change, however. Policy teams need to interpret the SCP evidence base carefully before they can condense it into key facts, core messages, and choice sentences which can be inserted into important policy documents. As noted above, this interpretation process risks being unsystematic and inconsistent: the next tool proposes a way of addressing this.

### 4.3 Creating Policy Perspectives

*“We only know what we need to know when we need to know it.”* Attributed to Snowden

Policy thrives on short pieces of information; but the shorter they are, the more important it is that the process of developing them has encouraged diverse perspectives, challenged received wisdom and falsified outdated or incorrect assumptions. The bullet-point style common in policymaking can mask the alternative interpretations that could be put on the evidence, encouraging a false sense of consensus when none may exist.



The traditional approach to doing this is to ask researchers to outline a series of recommendations at the front of their reports – but these are rarely set in the context of current policy needs, and often do not take account of how the evidence is likely to be used. Instead, the knowledge brokering function of the SCP evidence base needs to support a joint exploration of the evidence contained in research and other reports.

What I propose is a systematic *process* of interpreting research reports and other pieces of evidence so that:

- Multiple interpretations of the evidence are encouraged and presented

- The evidence is interpreted in the context of its likely use in policy
- Non-technical specialists can pick up the key issues for a policy area very quickly
- A wide range of information can be summarised rapidly for current policy debates
- A wide range of people develop a good, shared understanding of the interpretation – whether this be consensus on the way forward or a series of challenges and contested ideas

Policy Perspectives are the final part of the 3:25 report structure. They would be a single sheet of paper: the front containing the analysis, the back containing an assessment of the robustness of the evidence and links to the evidence trail. An example of one that has already been produced is given in Annex B2.

The process of producing Policy Perspectives would be led by some or all of research managers, theme managers, or policy analysts. Where emerging evidence is complex or contentious, this may need to be a facilitated workshop. Otherwise, they could simply co-ordinate the writing process. Either way, their role would be to facilitate the dialogue between the two sides and to ensure that the resulting document gives an accurate summary of the implications.

*[Note that while it is important that people from the evidence team lead the process, they must not capture it. Even if their technical knowledge is sufficient for theme managers (for example) to write a Policy Perspective on their own, the process of producing Policy Perspectives is designed to improve the co-production of knowledge by both sides. It needs to be an open process involving policy clients, members of the evidence team and researchers. If not, it will appear that research information is simply disappearing into the black box of policymaking; and researchers will lose a valuable opportunity to learn about the context of policy development.]*

Interviewees felt that this was a useful process: it would contribute to policy's understanding of complex issues, would be a valuable dissemination tool to external stakeholders. While short summaries cannot contain all the arguments, another important aspect of Policy Perspectives is that they begin the evidence trail. Particularly contentious interpretations of evidence would be flagged, so that the nuance and detail could be followed back to source.

Five pilot Policy Perspectives have already been written by the Sustainable Behaviours team, drawing on work which preceded this report. They have proved useful in bringing non-technical specialists up to speed with important policy issues, have been used as dissemination documents to engage beyond the evidence base team's immediate circle, and have demonstrated that it is possible to condense complex messages without losing nuance.

Both evidence teams think it would be useful to revisit key reports that are still relevant to ensure that the evidence they contain is thoroughly interpreted and used to challenge and inform current policy debates. Examples include the shopping trolley and sustainable tourism reports, work on carbon balances and the study on alternative waste treatment technologies. Interviews with evidence providers suggest that the external cost to Defra of producing a Policy Perspective from a completed report would be about £2,500. It would cost less to embed this process into ongoing projects. Production of a Policy Perspective should be written into the research contract as a deliverable with a specific approach to be followed.

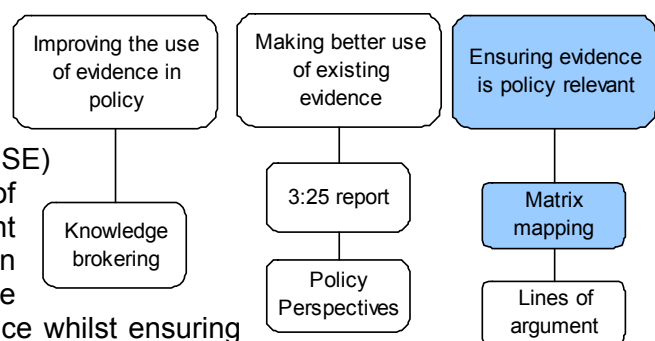
## 5. Ensuring that evidence is policy-relevant

This section describes two techniques which improve the policy relevance of the SCP evidence base. They are based on the premise that ‘robust evidence’ is only ‘robust evidence for policy’ when it is sourced, assembled and interpreted in context and for application; and when this is achieved by engaging *with* stakeholders, not following formal written consultation alone.

The matrix mapping exercise was developed to ensure that evidence needs – new needs and those already identified – are clustered into procurable programmes of work. The lines of argument technique is used to generate new evidence needs in a way that ensures they are policy relevant.

### 5.1 Genesis and use of matrix mapping

Matrix mapping emerged from Defra’s Evidence & Innovation Strategy, which mapped Defra’s entire evidence base for policy. Subsequent work in the Health & Safety Executive (HSE) demonstrated that the process of planning evidence procurement benefited from engaging stakeholders in producing the maps; discussing the scope of programmes to gather evidence whilst ensuring that they remain led by the policy or other business goals of the organisation.



Matrix maps help define clusters of evidence needs that can subsequently be procured – as research programmes, programmes of stakeholder engagement, statistical databases, etc. The process continues the theme set by lines of argument. Matrix maps ensure that policy goals define the shape of the evidence base and engage stakeholders substantively in the planning process. They are also a useful way of summarising a large amount of information on a single sheet of paper to allow cross-comparison between different evidence bases.

Matrix maps were used in the science planning process in the HSE, to revise programmes of work and identify new areas. They can be used to rationalise existing programmes or to scope new work.

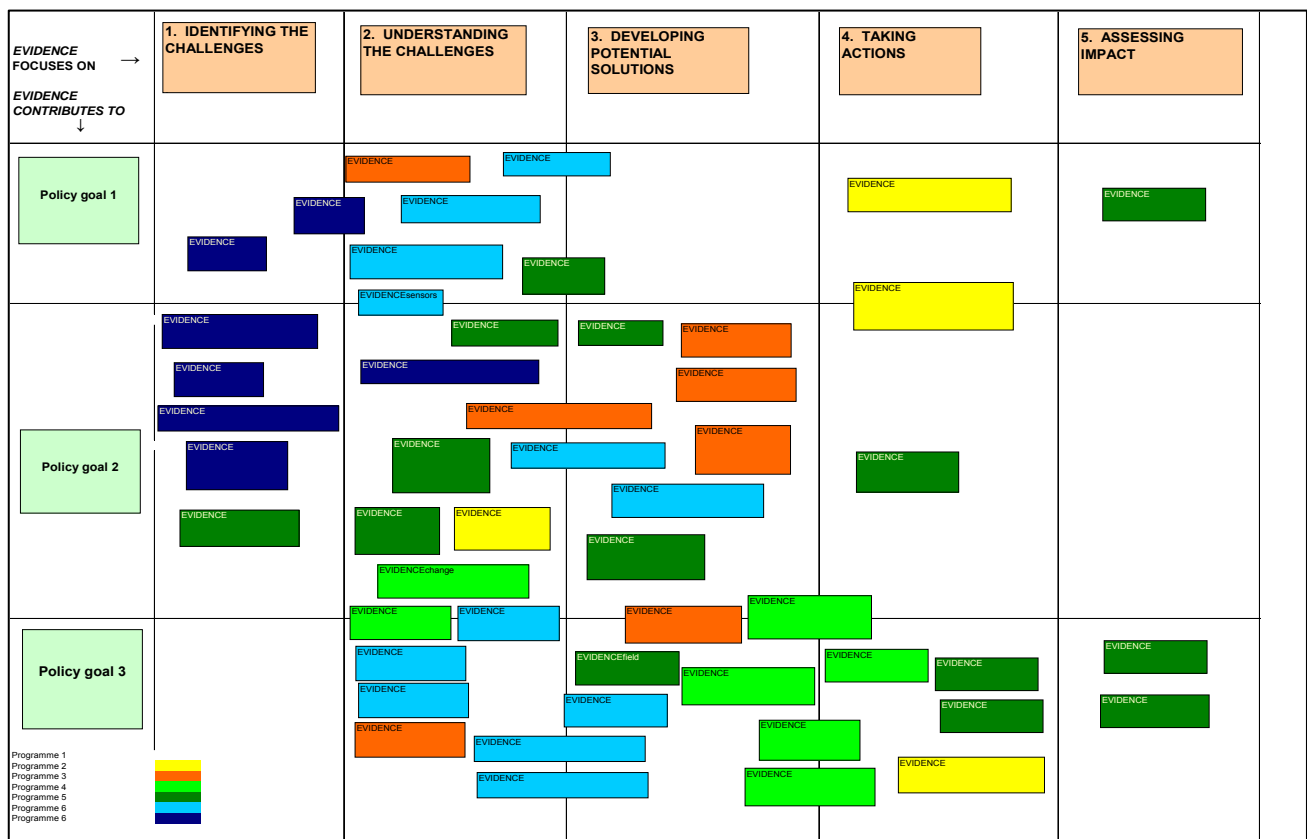
The row headings of the matrix set out the policy goals - what that evidence needs to contribute to - and the column headings set out how evidence can contribute. The detailed headings can be changed to reflect specific needs. Again, the point of matrix mapping is the process of engaging stakeholders in scoping the evidence base. Evidence needs that have arisen from previous backcasting exercises – preferably horizon scanning and the lines of argument work – are placed on the blank matrix one by one. Participants discuss where each particular need should be positioned, and its relationship to other evidence needs, helping to develop a general consensus on what these clusters might comprise.

Figure 6 shows a sample map from the HSE, with content altered to protect confidentiality. The column headings were decided as: looking to the future, understanding challenges, developing potential policies, delivering those policies and understanding the impact they have had. The row headings were the three overarching business goals for the HSE. The different colours represent how



participants at the workshop clustered the individual evidence needs into procurable packages of work.

Not all needs were grouped (yellow); in some cases programmes were large and crossed the entire policy cycle (dark green) and in others the focus was on identifying challenges across all business areas (dark blue: possibly horizon scanning). The fact that evidence needs were spread fairly evenly across the map suggest that this was a relatively mature policy area – a new policy issue might have focused more on evidence that helps identify and understand the challenges, with relatively less emphasis placed on evidence to develop potential solutions and to assess impact.



**Fig 6: a sample matrix map**

- In some cases the clusters may develop fairly easily, in other cases the evidence needs may be more scattered, and blank areas may arise in the matrix where no needs have been identified. None of these are either right or wrong, but as the map develops it becomes possible to ask questions such as:
- Why is there a blank area in this part of the map? Is it because we don't need to gather evidence in this area, because someone else is doing it, or because we haven't yet thought about it?
- Are we making the groups of evidence needs too large to be sensibly procurable? Are we combining the clusters in the most effective way?
- Who else is working in these areas? Are we taking enough notice of what is already out there?

The matrix maps are not designed to generate the final answer to the question of how the evidence base should be planned and procured: if anything they make the



process more complicated. In addition, they do not necessarily bring out the different strands of evidence (social science, economics, statistics) – unless there is a particular piece of disciplinary evidence which clearly relates to a specific goal. The information contained in the maps needs to be refined and prioritised with expert advisors before being fed into normal evidence planning and business planning processes more generally.

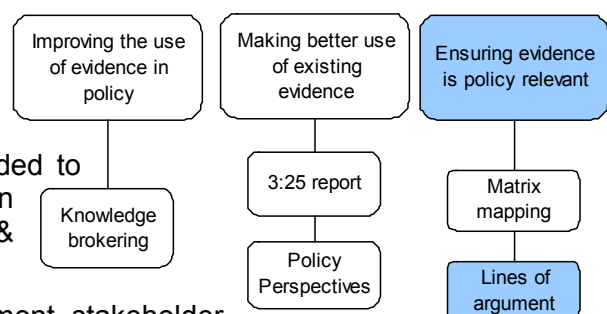
These workshops need both independent facilitation and the presence of senior policymakers, as a great deal of discussion can be generated about the precise wording of the row headings, what is needed to deliver those policy goals, and how the evidence needs that have been identified relate to existing programmes of work. Detailed instructions for facilitators are given in Annex B3.

### When are matrix maps most cost-effective?

Matrix maps can be used to scope new areas of work or to rationalise existing ones. They could be used to merge two evidence programmes, as long as the goals are clearly set out and agreed. They would provide a useful first analysis of how the high-level evidence strategy would meet the needs of the high-level policy narrative. The maps can contain mixtures of existing and new information; and provide a way of identifying gaps in the evidence base that need to be filled in order to address the policy goals. This clear focus on what is needed to deliver the policy goals makes matrix maps different from standard research prioritisation exercises.

## 5.2 Genesis and use of lines of argument

The initial question posed was how the team could develop robust, timely and cost-effective evidence to underpin development of the SCP policy goal and subsidiary objectives. Additionally, it needed to comprise the three components of an evidence base - data, analytical evidence & evidence from stakeholder engagement.



When presented in structured lines of argument, stakeholder opinions represent existing framings of the potential paths policy could take. “Different stakeholders present different lines of argument, frequently because they favour different approaches to delivery of the same goals (eg technological solutions, green taxes or cultural change) and may be selective in their use of analysis and data to support their case...The exercise of constructing these frames – as lines of argument - allows a mix of policymakers and external stakeholders to jointly explore the diversity of values, goals and innovation needs around the complex issues of sustainability; while ensuring that discussions are based on the best available knowledge.” [13].

Large multi-stakeholder workshops used backcasting to allow stakeholders to express their views on the breadth of objectives that could be contained by the overarching SCP policy goal; and the important steps along the way to achieving those objectives. Participants then self-organised into groups, asking a series of four questions in this order:

1. Why is this issue important?
2. Why is change happening?

3. Why do we need to intervene to change the rate or scale of the impact of this change?
4. Why should Government intervene?

They then summarised the answers into a 'line of argument' which was addressed as a fifth question:

5. Why do we need a SCP policy on this issue?

Evidence needs were then identified against this line of argument. An analysis of the workshop outputs shows that lines of argument produced evidence needs that were substantially more directed towards achieving SCP policy goals than previous methods that had been used.

The lines of argument technique reverses a common problem solving tool, used to get at the root of problems in organisations. Instead of taking an issue as given and working back in time from the present to the root cause of the problem in the past; lines of argument take the policy goal as given (far in the future) and then establishes potential pathways to the achievement of that goal.

#### **When is the lines of argument technique most cost-effective?**

The principles of evidence-based policymaking show that scoping an evidence base for policy needs to be substantively different from formulating a research programme. It needs to be led by policy goals; encompass data, analytical evidence & evidence from stakeholder engagement; and to focus on uncovering the different framings of the paths policy could take. The lines of argument technique outlines the contours of the evidence base: it does mean that research programmes or expert advisory committees are no longer needed.

Lines of argument could be used at various times in the policy process. In order of their potential cost-effectiveness, these are:

- New policy areas where there is little evidence: this is where it may well be most cost-effective, ensuring that resources are not spent on evidence that is not directed towards understanding the policy goals
- Where a more strategic approach needs to be taken to policies: where the focus has become too short-term. Lines of argument could be a useful intermediary step between horizon scanning & futures techniques and policy formulation
- Where existing evidence needs to be realigned towards new policy goals: reviews of research programmes could use lines of argument as a check that the direction of research remains relevant to current policy priorities
- Where stakeholder engagement in the evidence base has been ineffective (too little time spent on engagement, or too few stakeholders engaged)
- Where there is uncertainty in the policy environment and the evidence is contested or open to alternative interpretations. Lines of argument will not solve the problem of contested evidence, but will allow a more open exploration of its implications *for policy* rather than focusing on which piece of evidence is 'correct'.

Lines of argument would follow on particularly well from a horizon scanning exercise which would inform the backcasting technique. They are also complemented by the matrix mapping exercise (described in section 5.1) which takes the evidence needs identified in the workshop and begins the process of turning them into procurable programmes of work.

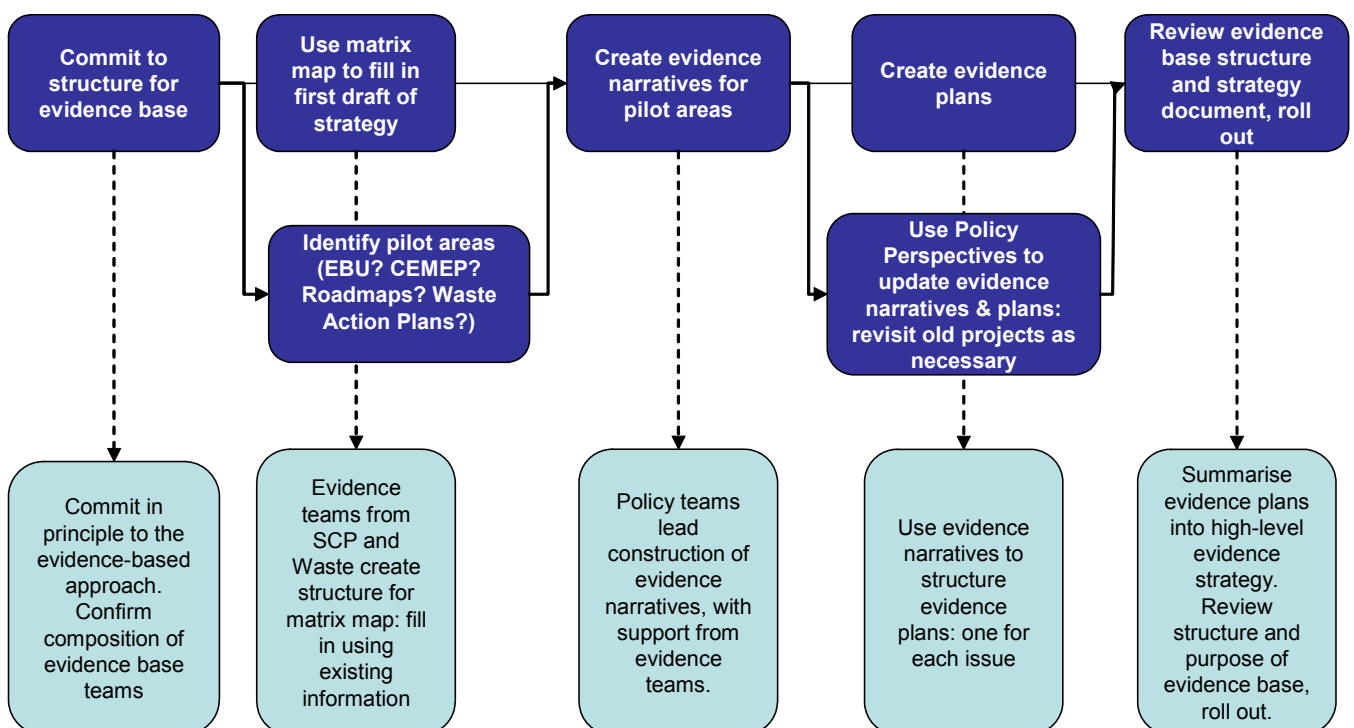
The technique is described in detail in Bielak *et al.* [14] and the comprehensive notes used by workshop facilitators are attached to this report in Annex B2.

## 6. Implementing a knowledge brokering approach to managing the SCP evidence base

### 6.1 Detailed recommendations

A suggested team structure for the SCP and Waste evidence teams is given in section 3.4. This section details what needs to be done by such a team to implement a knowledge brokering approach.

Most of the suggestions involve a change to existing practices: a well-structured evidence team will be able to support policy teams as they draw up the different documents demanded of them. The only additional programme cost proposed is the cost of producing Policy Perspectives from completed reports, at approximately £2,500 each.



**Figure 7: Creating and managing the SCP & Waste evidence base**

The overall evidence-based approach would be piloted within a ‘first cut’ of the strategy, before being reviewed and rolled out. I suggest that the pilots are selected so as to combine the existing examples of good practice:

- The Environmental Behaviours Unit’s evidence narrative
- The Milk & Dairy Roadmap, which could be strengthened with a slide kit resembling the EBU evidence narrative
- The proposed Waste Action Plans (if suitable)

Detailed recommendations are given in Table 6.

**Table 6: Detailed recommendations for implementing an evidence-based approach**

<b>1. Develop the structure of the evidence base for SCP and Waste</b>	
a. Commit to the structure for the SCP and Waste evidence base	The new structure will demand that policy teams take responsibility for their evidence base, with support from the evidence base teams. Commitment at Programme Board level will be needed to follow this through
b. Develop detail of the structure of the evidence base	The structure of the evidence base will follow on from structure of the SCP high-level policy narrative.
c. Decide pilot areas	Suggested pilot areas are Environmental Behaviours, the Milk & Dairy Roadmap, and the proposed Waste Action Plans. Also consider bolstering the CEMEP report
<b>2. Pilot evidence narratives &amp; evidence plans</b>	
a. Draw from the existing examples of good practice	<ul style="list-style-type: none"> <li>• Finalise EBU evidence narrative</li> <li>• Further support Milk &amp; Dairy Roadmap by creating modular evidence (link to FFG activities)</li> <li>• Create evidence narratives for Waste Action Plans</li> <li>• Consider evidence narrative for CEMEP report</li> </ul>
b. Develop evidence plans around the evidence narratives	Develop short evidence plans for each of the above, which outline the structure of evidence base, indicators of progress, relationships with evidence providers, draft budget
<b>3. Produce Policy Perspectives from current and previously-completed projects</b>	
a. Use 3:25 structure for existing projects	Research / Theme managers implement knowledge brokering approach to the management of the final stages of current projects; with support from evidence team as necessary
b. Revisit previously completed projects to product Policy Perspectives	Approximate cost of revisiting completed projects is £2,500 per project. Decide which projects need to be revisited in this way, and plan according to remaining programme budget
c. Update evidence narratives and evidence plans	Use evidence from 3:25 final project reports, and from Policy Perspectives, to update evidence narratives & evidence plans
<b>4. Review and update structure of evidence base</b>	
a. Use evidence plans to populate the structure of the evidence base	Use detailed evidence plans to update evidence strategy: check that the summary retains the logic and that it informs the high level policy narrative
b. Review process of creating the evidence base, its structure and individual components	Do the evidence narratives and evidence plans add value? To whom? How well do they function as dissemination tools (narratives) and management tools (plans)? What changes might need to be made?
c. Decide future components of evidence base	Decide the opportunity cost of rolling out the structure to cover all of SCP and Waste; or whether to continue a staged approach