Chapter 6
Science Communication and the Tension Between Evidence-Based and Inclusive Features of Policy Making

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Effective science communication within the policy domain is becoming more challenging due to the increasing complexity of, and higher aspirations for, public policy making. Not only are policy issues becoming more multifaceted and inter-linked, but certain features of modern policy-making salient to diffusing knowledge are in tension with each other. The causes and consequences of these tensions are rarely articulated, let alone considered with the intent of ameliorating the resulting impasses. Consequently, we explore the mounting tension between the demand for evidence-based policy on one hand, and for meaningful public input on the other.

Evidence-based and *inclusive* have been two of the nine features of good practice in modern policy making identified by the UK Government over the past decade (Bullock et al. 2001; Cabinet Office 1999). In this prescription, *evidence-based* requires that the advice and decisions of policy makers depend upon the best available evidence from a wide range of sources including stakeholder engagement; whereas, *inclusive* requires that the policy-making process takes account of the impact on and/or meets the needs of all people directly or indirectly affected by the policy, and involves key stakeholders directly (Cabinet Office 1999). The tension arises because the guidelines policymakers are bound to follow have not yet been reconciled with our improved understanding of the principles of modern policymaking (see Bochel and Duncan 2007).

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Although the prescription for *evidence-based* policy making includes a requirement to engage with stakeholders, it is typically realised in practice as a focus on analysis and the quest for a definitive truth in "sound" science. *Inclusive* policy making is typically concerned with engagement and recognising the legitimacy of a diversity of interests and views. These two features can therefore pull the policymakers and their supporting analysts in different directions, and require different skills and mind-sets. New methods of public engagement such as citizen juries and wikis tend to be considered as facets of the *inclusive* feature of policy making without necessarily being examined for the role they can play in support of the *evidence-based* feature.

To the extent that these two considerations are addressed, the consequent streams of activity tend to run in parallel. There is a tension between the demand for evidence-based policy on one hand and for meaningful public input on the other. This necessitates nimble and astute *tension brokers*, skilled in communicating science in the different contexts, and who have three primary tasks; knowledge brokering, reconciling different ways of knowing, and recognizing when reconciliation is not achievable and/or not desirable. Knowledge brokering involves facilitating the exchange of knowing with the intent of providing or creating understanding, that if incorporated into policy, would result in policies that reflect the most up-to-date, best available, knowledge of the issues involved and the qualifications that apply to that knowledge (Michaels 2009). Bringing together different ways of knowing in the policy context we are considering, is about enabling the reconciliation of the different ways of knowing associated with the two considerations of *evidence-based* and *inclusive*. Appreciating that reconciliation is neither universally feasible nor desirable is an essential prerequisite in understanding that not all discordant circumstances are malleable to worthwhile compromise.

We sketch out some of the more pressing consequences of the quandary of trying to satisfy, let alone maximize, evidence-based and inclusive considerations in policy making by selectively drawing on UK and US perspectives of incorporating science into environmental policy making. To better understand how we have arrived at this quandary, we begin by highlighting some of the key milestones, trends, and cultural dispositions that have shaped the recognition and demand for evidence-based and inclusive policy making. We then present a salutary tale of the UK Committee on Radioactive Waste Management's experience of trying to satisfy the conflicting demands for evidence-based and inclusive deliberations before considering how to address conflicting demands in the policy process. We emphasize the potential contribution of tension brokers, adept in recognizing the relative weighting of the demands in a particular policy process, and able to bring to it the requisite combination of skills.

6.1 The Two Considerations and the Resulting Tension

We begin this section by considering how science has been at the heart of what constitutes evidence. While the UK Government defined *evidence* fairly broadly as discussed above (Cabinet Office 1999), its expression in terms of the guidance given

to policymakers has, we believe, resulted in a particular focus on that sub-set of evidence that is labelled *science*. UK Government initiatives have included the updating of guidelines on the use of scientific evidence in policy making (Office of Science and Technology 2000, 2005, 2010), the auditing of their implementation by Government departments and agencies (Office of Science and Technology 2001), and the installation of Chief Scientific Advisors in senior positions in Government departments. The percolation of these initiatives through to practice may be witnessed, for example, in statements of the Environment Agency (the main environmental regulator for England and Wales) that its decisions would be based on *sound science* (Environment Agency 2007). This focus on science has drawn criticism from some quarters that implementation was following an unduly narrow perspective (e.g. Hammersley 2005).

With regard to inclusivity, calls have continued to be made for a more inclusive process in the UK. For example, the House of Lords Science and Technology Select Committee (2000, p. 8) concluded that "direct dialogue with the public should move from being an optional add-on to science-based policy-making … and should become a normal and integral part of the process" (p. 8). Similarly, the Council for Science and Technology (2005) recommended that Government "now needs to generate a change in culture across government to ensure that non-expert and non-partisan perspectives are used effectively to inform the development of policies that are based on science" (p. 1). However, Bochel and Evans (2007) reviewing progress on *inclusion* in UK policy making since the Modernising Government White Paper (HM Government 1999) conclude that despite the generation of a considerable amount of guidance material on different approaches to inclusive policy making, "it remains a contentious and elusive aim" (p. 121).

In the US there is a prevailing belief held by those closely associated with the policy process in the rationality of science, and science is used as an important instrument in legitimating Government decisions (Jasanoff 1997). A ruling of the US Supreme Court in 1980 that regulators must demonstrate *significant risk* before regulating, and a 1983 guidebook from the National Academy of Sciences prompted the widespread adoption of scientific risk assessment as the basis for US regulation (Wiener and Rogers 2002).

However, those beliefs in, and requirements for, a scientific approach sit alongside a strong commitment to a pluralist democracy (Beierle and Cayford 2002) in which divergent opinions need to be expressed as a prelude to public action (Konig and Jasanoff 2002). US agencies consequently have historically had more formal procedures in place than their counterparts in the UK to ensure continual dialogue between decision-makers and their public clients and critics (Jasanoff 1997).

Governments in both the UK and US therefore continue to promote the two considerations in their policy making. Yet the contrasting cultural predispositions associated with the two considerations, two of which are sketched below, do not suggest an easily achievable middle ground:

- An evidence-based approach tends to emphasise a rational and analytical mode of policy making around clearly identified problems, which is conducted with a high degree of autonomy for evidence providers, and searches for objective truth

and the one right answer. An inclusive approach recognises the interdependence of the players, focuses on engagement and integration, and accepts that the problem and the *truth* are to varying degrees socially constructed and that there may be many *right* answers.

- Emphasising an evidence-based approach in a rational and analytical mode of policy making tends to result in a process characterised by a progressive closing down of the way in which the issue is viewed and convergence on a particular policy option (Stirling 2005). Under such circumstances, expert elites may well retain their authority. In contrast, an inclusive process emphasising public engagement may be characterised by an opening up of the way the issue is perceived and lead to generating divergent policy options. The public/stakeholders do not want just to inform but to influence, and have expectations to do so. UK and US Governments have expressed concern that public engagement should be *genuine* (see, for example: House of Commons Science and Technology Committee 2007; US Environmental Protection Agency 2006). In these circumstances, science may well point in one direction, and the public another.

The collision of the contrasting expectations is illustrated by the experience of the Committee on Radioactive Waste Management in the UK. It reveals the perils of what in practice is something of a tightrope walk.

6.2   A Salutary Tale

The Committee on Radioactive Waste Management (CoRWM) was set up in 2003 by the UK Government to propose (by mid-2006) a technical solution for the long-term management of the UK's higher activity radioactivity wastes, and to inspire public confidence in that solution (CoRWM 2006). The Committee was therefore established to broker knowledge among science, public, and policy communities. Firmly embedded in its terms of reference was the tension between taking a rigorous scientific/analytical approach on the one hand, and achieving legitimacy and acceptance of policies through a process of political engagement on the other.

After some 30 years of failed attempts to establish a disposal route for radioactive wastes in the UK—attempts widely characterised as secretive and following a *decide-announce-defend* approach—the Committee recognised that it was starting from a low base in seeking to "inspire public confidence" (MacKerron 2007). A strong emphasis was therefore placed on engagement with the public, as reflected in both the makeup of the Committee and in its deliberative style of working (CoRWM 2006).

Within 12 months of the formation of the Committee two members had left (one resigned, the other was sacked) strongly criticising its approach to science: "…there can be no doubt that CoRWM's approach to science has been defective, even negligent, and continues to be so" (Ball and Baverstock 2006, p. 44). Also, an inquiry by the influential House of Lords Science and Technology Select Committee had

expressed strong concerns about, "…the undue emphasis given to investigating methodologies of decision-making and public and stakeholder engagement at the expense of identifying the right scientific and technical solution", and, "…we have no confidence in the technical ability within CoRWM itself sufficiently to understand the science of some of the disposal options" (House of Lords Science and Technology Select Committee, 2004, pp. 4, 12).

While an increasing emphasis was placed on the science and expert input in the latter stages of the Committee's work, criticisms of its approach to science rumbled on (Collier 2005; Royal Society 2006). The problems were identified by the dissident (and departed) Committee members as rooted in "the age-old intellectual debate between rationalism and alternative social theories such as social studies, postmodernism and relativism" (Baverstock and Ball 2005, p. 316). In contrast such concerns were characterised by the Chair of the Committee in his lessons learned report (MacKerron 2007) as, "there is a view, especially in parts of the science community, that processes such as CoRWM's should privilege the role of science and be science-led, often interpreting 'science' in terms of a limited range of disciplines" (p. 9).

The experience of the CoRWM reveals that it is not enough to acknowledge the two considerations or even to attempt to address them in parallel. What is needed are ways to generate robust policy options which acknowledge, if not reconcile, however incompletely, the tension between evidence-based and inclusive policy making and allow for explicit choices to be made between the different options. In doing so, we need to acknowledge that not all policy issues share the same characteristics and by extension they do not need to follow the same procedures. Some will need "…a highly political, pluralist, bargaining and incrementalist approach… (while) …other issues—probably only a small minority—will both require and lend themselves to a much more planned or analytical approach" (Hogwood and Gunn 1984, p. 24). Determining the characteristics of a policy issue is an important prerequisite to determining what emphasis to place on the different policy processes to use (Shaxson 2008) and the organisational issues involved in implementing those processes (Shaxson 2009). The following section provides a first cut at what might be some of the options for doing so.

6.3   Tension Brokering

The two considerations, realised in practice as a thoroughly rational process based on scientific evidence and analysis on the one hand, and a more political process closely engaged with, and responsive to, the diversity of views and special interests on the other, generally follow parallel tracks. Activities to implement them co-exist, but there is little integration.

What are needed are effective and transparent processes for the constructive intertwining of the two considerations. We want policies and regulatory decisions that appropriately reflect our best understanding of the characteristics of the

particular policy issue and the relevant natural and social systems. At the same time, we want these policies to be grounded in an appreciation of a diversity of viewpoints and interests, and engender acceptance and commitment to implementation. Various techniques and methods go some way to fitting the bill. Stirling (2005) categorises them according to whether they are used in one of two frameworks:

- a *closing-down* framework aiming to converge, consensually, on a particular view using such tools as citizen juries or consensus conferences; and
- an *opening-up* framework aiming to explore how alternative courses of action fare under different framing conditions using such tools as scenario workshops or deliberative mapping.

While there is no shortage of how-to guides on the above specific techniques (Stirling 2005 provides a useful summary) the use of these techniques in policy-making and regulation remains the exception rather than the rule (Council for Science and Technology 2005). One challenge is to embed these processes that achieve this rather delicately balanced intertwining of analysis and engagement in day-to-day policy and regulatory decision making activities. These processes and the circumstances that enable their use need further development so that a proportionate approach consistent with time and resource constraints can be taken. We should aim for a portfolio of processes so that approaches can be selected and tuned to the particular characteristics of the policy issue and the circumstances in which the portfolio's components need to be applied, for example:

- within *science*, processes which respond to calls to widen the range of inputs to include all relevant disciplines and non-mainstream views (European Commission 2002; Office of Science and Technology 2010), generating advice which is salient to policymakers while providing a balanced account of uncertainties and divergent views;
- within *policy making* the development of processes which enable effective communication and engagement between *science* and *non-science* bringing in values, interests, and political realities to the day-to-day business of Government; and
- a commitment to transparency in both science and policy making, to enable an intelligent and appropriately weighted account to be taken of a diverse set of inputs.

While the use of such processes may well become more routine as a result of their development, testing, and refinement, they will always require people working at the science-policy interface to tune them carefully to the particular challenges of the policy issue, and to implement them thoughtfully. There is a need to develop the function of *tension brokering* whose core is the accommodation of the two considerations through the intelligent application of these processes. Crucially, it is not necessary to be badged as *a tension broker* to act as one (see Jones et al. 2012): it is the functions people perform that are important, not the positions people hold in an organisation (Shaxson et al. 2012).

In enabling the process of accommodating the two considerations the act of tension brokering may be likened to tightrope walking, with the broker able to fall off on either side such as in the following examples:

- If too much emphasis is put on following an analytical and evidence-based process the resulting policy may lack legitimacy, and be hampered by a lack of support in its implementation.
- But if there is too much attention to inclusion, then the policy maker may be faced with an overwhelming diversity of contradictory views and may be unable to interpret them into a coherent set of understandings of the relevant natural and social systems.

While tension brokers work in the service of both evidence-based and inclusivity considerations in policy making, rather different mindsets and skills are required for each consideration. Evidence-based policy considerations may emphasize a role concerned with translation and dissemination of expert views, while inclusivity may be much more about soliciting a range of views that may differ in terms of substantive weight and how well articulated they are. Informing the knowledge brokering needs in evidence-based policy is a literature that considers moving the science from experts to decision makers (Bielak et al. 2008; Clark 2007; Holmes and Savgard 2008; Michaels 1992, 2005; Pielke 2007; Scott et al. 2006). Informing the inclusivity consideration is a literature that considers public participation and stakeholder involvement (Arnstein 1969; Beierle and Cayford 2002; Gavelin et al. 2007). Both of these literatures offer specific suggestions on the attributes and skills necessary to play the critical role of an intermediary in the policy process (see also Jones et al. 2012). For example, from the studies by Clark (2007), and Holmes and Savgard (2008), the distinctive skills of a knowledge broker include:

- being an effective mediator with good interpersonal skills;
- having a good sense of different arguments, able to see the forest from the trees, to produce a well-balanced synthesis or draw out competing lines of argument;
- being familiar and well connected with the worlds of research and policy, and able to see issues from both perspectives; and
- having a broad grounding in science.

But these skills are in short supply (Scott et al. 2005). Current initiatives to slim down administrations are exacerbating this shortage by reducing the numbers of science advisers, research project officers, and policy analysts in government departments and agencies who traditionally have performed significant elements of the knowledge brokerage role (Holmes 2005; Holmes and Savgard 2008). Also in short supply are stakeholder facilitation skills, especially in combination with technical expertise (Campbell 1997). Reversing these trends is essential if the two considerations are to be reconciled.

It is important to recognize that reconciliation is not always the desired end point. Not only do the evidence-based and inclusive approaches frame policy issues in different ways, different politico-administrative systems give rise to different ways in which science, policy, and politics contribute to decisions (Jasanoff 2005).

The function of tension brokering not only involves deciding in a given set of circumstances what is the appropriate mix of knowledge brokering and facilitation activities, it is deciding when reconciliation is not the productive way forward and deciding who has the legitimacy to make the choice about which side of the tightrope to jump off.

6.4   Conclusion

Communicating science in the public policy realm requires recognizing and addressing the tension between two considerations of good practice in contemporary public policymaking—evidence-based and inclusivity. When those developing environmental policy and regulation have pursued them in parallel, the results have been disappointing. Following this same track is likely to continue to be dissatisfying. Evidence is shifting from a traditional, single disciplinary perspective to the multi- and interdisciplinary perspectives consequent on engaging with a broader range of scientific expertise, to the yet broader and ill-defined spectrum of evidence arising from stakeholder engagement in an inclusive approach. Ensuring the *quality* of evidence and of supporting the integration of the different kinds of inputs in the decision-making process requires tension brokers who bring the best of what we know about knowledge brokering and facilitation to bear. At the same time they need an appreciation of when reconciling the two tendencies is impossible—when public policy must be built on choice between discordant alternatives, when science is one among competing considerations.

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