

Chapter 1

Shifting Policy Debates and the Implications for Governance

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Policy-making is in a state of flux and governments are stressing the need for more integrated or “joined up” policies to deal with the complex issues now facing society. There is an ongoing policy revolution taking place at global, European, UK and regional levels but the buzz-words that are often used to describe this revolution – “Third Way”, “joined-up policies”, “what works” – are sometimes regarded with scepticism.

The *Modernising Government* initiative (HM Government, 1999) in the UK had as one of its primary themes the need for forward looking, more integrated policy-making. The policy environment for science, technology and innovation (STI) is one of the areas most in need of an integrated policy approach. Getting this right is vital to nations’ economic prosperity and hence their ability to deliver on other social and environmental policies. However, there is arguably less integration in this area than in many others and, so far, there has been little guidance on what integrated policies would consist of and how they might be delivered.

The Governance Perspective

Theories of governance draw on a range of disciplinary perspectives and operate at multiple levels (local, regional, national and supra-national). In the most common current usage of the term, “Governance” is seen as implying a move away from the previous *government* approach (a top-down legislative approach which attempts to regulate the behaviour of people and institutions in quite detailed and compartmentalised ways) to *governance* (which attempts to set the parameters of the system within which people and institutions behave so that self-regulation achieves the desired outcomes), or put more simply, the replacement of traditional “powers over” with contextual “powers to” (Pierre and Peters, 2000). In such a governance system, permeable and flexible system boundaries will facilitate communication and will support the achievement of higher level goals. These assumptions underline the switch from *government* to *governance* in debates about the modernisation of policy systems implying a switch from constraining to

enabling types of policy or regulation (i.e. from “sticks” to “carrots”). The UK literature tends to discuss the emergence of “new” modes of governance, and in particular “joined-up government”, in terms of a response to Thatcherite reforms, specifically as a way of coping with the fragmentation effects of New Public Management (NPM) (Newman, 2001; Bevir and Rhodes, 2003) although its antecedents arguably go back much further. The reconnection in the 1990s of the work on networks in policy-making with studies in organisational sociology of networks of service provision provided a spur to the rethinking of governance in network terms which in many ways has provided a critical link to the joined-up government debate (Perri 6, 2004).

The governance debate has its origins in various disciplines spanning institutional economics, international relations, organisational studies, development studies, political science, and public administration (Stoker, 1998). As others have noted, the term “governance” is currently applied to “everything from corporations to rural society” (Sloat, 2002) and the academic literature on the subject of governance has been described as “eclectic and relatively disjointed” (Stoker, 1998). Its meaning is contested and often lacks definitional clarity (Bache, 2003) although most commentators accept that “governance” is no longer a synonym for “government”. However, Stoker (1998) argues that, as governance is ultimately concerned with creating the conditions for ordered rule and collective action, its outputs are no different from those of government. What is significant is the difference in processes.

Most would accept that governance refers essentially to the increased role of non-government actors in policy-making (Bache, 2003) and it is generally regarded as implying an increasingly complex set of state-society relationships in which networks rather than hierarchies dominate the policy-making process (Bache, 2003). The current work adopts the view that “governance” refers to the development of governing styles in which boundaries between and within public and private sectors have become blurred; in this approach the role of the state changes from being the main provider of policy to one of facilitating interaction among various interests (Sloat, 2002). In this context, government’s role is increasingly one of co-ordination and steering (Bache, 2003).

From a governance perspective, the process of governing is an interactive one because no single actor has the knowledge and resource capacity to tackle problems unilaterally (Kooiman, 1993) and the powers of government tiers are no longer clearly distributed, as co-operation replaces hierarchy and legislative competences are shared among several levels (Sloat, 2002). In summary, this perspective focuses on the co-ordination of multiple actors and institutions to debate, define and achieve policy goals in complex political arenas such that the state no longer dominates the policy-making process and decisions are made by “problem solving rather than bargaining” (Sloat, 2002).

“Governance” is therefore a term that takes different meanings in the hands of different authors and Newman (2001) suggests that, in fact, it comprises multiple and conflicting strands and is constituted by disparate forms of power. Some authors take a “state centric image of governance” (Pierre and Peters, 2000) in

contrast to Rhodes' approach (Rhodes, 1997), which downplays the role of central government. Others focus on the complexity, dynamics and diversity of interactive social-political governance where the state still has a role in steering society (Kooiman, 1993). In this scenario there has been a shift from formal powers to political capabilities so that there is now less reliance on coercive policy instruments and a greater reliance on more subtle techniques. This has led to a restructuring of state institutions, creating agencies, quangos and other institutional forms that operate at considerable distance from control by the political elite (Pierre and Peters, 2000). Nevertheless, these authors contend that states as centres of governance still play a defining role in the economy, in international relations, and in many areas of domestic politics and policy. This perspective highlights concerted public-private efforts and co-operative rather than adversarial policy strategies. Pursuing this collective interest through different forms of governance on and between different institutional levels requires closer, more continuous and more informal contacts between political institutions and their environment (Pierre and Peters, 2000 p.196).

From an academic standpoint, the governance perspective might just be "a simplifying lens to a complex reality" (Stoker, 1998) but its practical value rests in its capacity to provide a framework for understanding changing processes of governing, characterised by processes of adaptation, learning and experiment (Stoker, 1998). This approach necessitates a new policy design where the state acts as a moderator and enabler within a network-oriented polity rather than a hierarchical interventionist approach. This requires a "new mode of governance" with, on the one hand, more elaborate forms of institutionalised co-ordination between the European level and national and regional levels, and on the other hand, a continuous reflection on appropriate principles of governance with respect to both strong leadership and participatory approaches which in turn requires a re-organisation of policy administrations in a way that enables flexible, horizontal co-ordination and exchange (Edler et al., 2002).

Policy Integration

In general, public policy is not used to tackling problems in an integrated manner and, in particular, policy approaches for areas such as innovation are usually compartmentalised in different departments and agencies that compete for power rather than co-operate to tackle policy issues (Cooke et al., 2000 p.142). Despite current and emerging socio-economic and political developments where policy-makers in most industrialised countries are trying to reform traditional policy approaches, intradepartmental rather than overall co-ordination would still seem to be the preferred policy mechanism in the UK at least where individual agencies are allowed self-determination while trying to avoid undue duplication of effort or pursuit of conflicting goals in different parts of government (Ronayne, 1984 p.141). In practice, it is still true that co-ordination in Britain tends to mean cross-membership of committees: an "insider's world" where a relatively small group of

senior civil servants, elite scientists, and influential industrialists move from committee to committee (Ince, 1986) and co-ordination between policy domains remains the exception rather than the rule.

Over the past thirty years there has been a steady shift in the emphasis of research policies at national and European levels, to obtain better value for money from public investment in research by ensuring that both curiosity-driven, fundamental research and applied research contribute as much as possible to improving competitiveness at national, European and international levels. New approaches to governance are being developed under a variety of labels at different institutional levels in many European countries. In the UK, what some see as an on-going policy revolution and others regard as a more managerial response to the often unintended consequences of NPM (Bevir and Rhodes, 2003), has been referred to as the “Third Way”, which promotes a network-based polity as an alternative to bureaucracies and markets (Bevir and Rhodes, 2003; Giddens, 1998)¹, with a strong commitment to more integrated or “joined-up” approaches to policy. Others have advocated “holistic governance” (6 et al., 2002) which goes beyond simply stitching together the plethora of government committees and policy documents and instead takes a more grassroots approach which moves away from a model of government that is structured around functions and services and instead focuses on solving “wicked” problems (6, 1997).

Some parameters of the new governance-based policy-making systems are relevant to STI policy, such as initiatives on policy integration, evidence-based policy, the use of standards and guidelines linked to policy evaluation, encouragement of openness, stakeholder involvement and consultation, and avoidance of unnecessary regulatory burdens. However, despite frequent references to the need for more integrated approaches to policy development, new governance initiatives in the UK are largely socially-oriented and ignore STI-related issues (Lyll and Tait, 2004).

The development of new governance structures, for example in the UK under the *Modernising Government* agenda (HM Government, 1999) focuses on modernising the processes of government, including a framework for excellence in policy-making and a strong emphasis on learning lessons from policy experience in other countries. The over-arching ethos is “what matters is what works” (Davies et al., 2000) with, at least in theory, a much freer flow of ideas across governments and government departments and from one level of government to another, focusing on ideas that can contribute to an effective system of governance, rather than on the ideology that generated the ideas.

The *cri de coeur* of the current Labour Government for “joined-up” policy is reflected in the goal of the *Modernising Government* initiative to develop a more integrated approach to policy-making, and a series of Cabinet Office publications (for example, Cabinet Office Performance Innovation Unit, 2000; Cabinet Office

¹ The term “Third Way” seems to have been dropped from the political lexicon in the UK recently, although the new governance approaches it described are continuing to be developed.

Strategic Policy Making Team, 1999) aims to improve policy formulation and implementation in areas that cut across the policy boundaries of traditional government departments.

Effective policy integration would imply that science-related policies ought to be crucial components of new governance initiatives but we find little evidence of their inclusion. The *Modernising Government* agenda concentrates almost entirely on the social policy arena covering social welfare, crime, health and education, these being the areas which focus groups tell government ministers are of most concern to voters. Science, technology, and innovation are apparently of lesser concern to voters as they are not linked in the public mind (and hence less likely to be linked by governments) to national competitiveness which generates the wealth to support the other functions, although others would argue (6, 2004) that there *have* been attempts with, for example, the publication of the Competitiveness White Paper (DTI, 1998) which aspired to provide an integrated framework of tax, subsidy, regulation, trade, patent and regional policy for the development of science-based industries in the UK, particularly in respect of the horizontal co-ordination of agencies' priorities.

As Tait et al. (2004) note, a consistent theme throughout this new governance agenda is the need for more integrated or "joined-up" policy approaches to remove contradictions, inconsistencies and inefficiencies caused when policies or regulations emerging from different government departments or different levels of government (regional, national, international) contradict one another or provide incompatible signals to policy targets. Policy integration is also needed to deal with the complexity and uncertainty associated with many decisions concerning science and technology. However, integration has itself become more difficult as the diversity and policy competence of interested stakeholders and publics has increased.

European Governance

Similar trends are also beginning to emerge at the EU level with important documents being published on European governance, the European Research Area (ERA), and developments in the Sixth Framework Programme (FP6). As in the UK, there is evidence of difficulty in integrating policies and particularly in spanning the divide between science/technology and society.

The gap between innovative thinking on governance in general and developments in science and technology-related policies is also apparent at the EU level. The *White Paper on European Governance* (Commission of the European Communities, 2001) has only one brief reference to the word "science" in the context of managing "...the challenges, risks and ethical questions thrown up by science and technology". There are no references to "evidence", and for "research" there is one mention of "research centres" and one to the ERA, although there are references to scientific committees and the need for their advice to be made publicly available. The overall impression is that science-related issues are of only

peripheral interest in the context of European governance although they presumably come into the picture downstream, as a part of policy implementation in sectoral documents such as those concerned with telecommunications or human embryology, rather than being integrated at a high level into the overall governance and policy development process.

The document on the ERA is the main focus of innovative EU thinking on science and research-related issues. One of its main policy planks is the forging of closer links between the EU Framework Research Programmes and the research systems of EU member states. The ERA will be implemented partly through FP6, involving also major changes in the organisation of research in Europe. Prior to the development of ideas on the ERA, and influenced to some extent by UK thinking on the development of Foresight, the Fifth Framework Programme (FP5) took a new direction by giving a strong emphasis to interdisciplinary integration, particularly between the natural and social sciences. FP5 targeted Key Actions to socio-economic needs and guided research collaboration among EU nations in a manner that increasingly included socio-economic components. It would be unrealistic to expect such a major change in research orientation and management to bear fruit within the time scale of a single programme and it is unfortunate that FP6 has largely abandoned the innovative approach on interdisciplinary research pioneered by FP5. Although essential if Europe is to compete effectively in a global economy, integrative approaches challenge many vested interests in both academic and policy spheres and, as we have noted, there have been strong reactions against it from several directions.

Global Governance Issues

As outlined by Tait and Bruce (2004), the increasingly rapid pace of technological innovation and the increasing size and power of multinational companies are leading to globalisation of production and trading systems accompanied by pressures for further trade liberalisation.

The emerging system of global governance is being mediated through international organisations like the World Trade Organization. However, such changes diminish the sense of power and influence of individual citizens and appear to negate local and national democratic processes, raising fundamental questions of sovereignty and governance at national and regional levels. They are also being opposed by increasingly vocal and well organised public groups acting against globalisation and the pressures that are driving it. In the context of developments in genetically modified crops, Tait and Bruce (2004) referred to the internationally organised consumer boycott as “a new instrument of global governance”.

Giddens (1999) noted this tension between pro- and anti-globalisation forces. He referred on the one hand to “... the mobilising dynamic of a society bent on change, that wants to determine its own future...”, and on the other hand he noted that we now live in a world where innovation and technological change have

generated hazards that are regarded as more threatening than so-called natural hazards.

National science-related policies can no longer operate effectively without considering the pressures and constraints imposed at the global level. These include:

- international trading relationships;
- intellectual property rights;
- the relevance of regionally-based technology clusters in the context of modern information and communication networks;
- public support for, or opposition to, individual innovations.

Horizontal integration of issues, policies and initiatives is in some cases lacking altogether. Where it has been attempted it is being modified because of difficulties in its implementation. For example, at EU, UK and regional levels, there is so far a general lack of integration between the modern approaches to governance being developed in the social policy arena and policies for science, technology and innovation which still seem to be driven by an old-fashioned, linear conception of innovation systems (Tait and Williams, 1999). However, in the chapter which follows, Perri 6 will argue that these concerns about a lack of horizontal co-ordination mechanisms at a global level are overstated.

Actors and Outcomes

Demands for more integrated approaches are driven by the increasing realisation that policies often deliver much less than is expected or intended, because of counter-productive interactions among the key actors, or because the policies arising from different sectors of the policy environment conflict with one another. On the other hand, where interactions among the actors or the policies are supportive, the desired outputs can be achieved more rapidly and at less public cost.

One strand of our research on governance (Tait et al., 2004) focuses on the key actors who are the targets of policies. These actors are linked to one another in often-complex webs of interaction and are influenced by a policy environment which includes regulations, fiscal measures, manipulation of the infrastructure, and a range of non-statutory, voluntary incentives and constraints. The overall aim of this mix of policies is to encourage the delivery by these actors of a set of outputs that are regarded as socially desirable.

The chapters in this book describe the perspectives of the policy-makers themselves and how they are attempting to influence actor/stakeholder networks in different policy areas and in different industry sectors. The range of relevant policies varies from one sector to another. Policies also differ in their nature (from legally enforceable regulatory instruments and fiscal policies, through voluntary codes of conduct, to government initiatives like Foresight) and are directed to

different targets in the actor network. It is part of the policy-maker's stock in trade to match the policy mix in their area of influence to the intended purpose (the outputs to be delivered). But real world complexity usually means that the match is less than perfect.

Different Modes of Policy Integration

Our analysis covers two radically different types of policy integration:

Vertical Integration

Policy integration across levels of governance depends mainly on the ability to communicate effectively across system boundaries and the institutional structures determined by government policy-making at the highest levels has a major influence on the effectiveness of such communications. Vertical integration is thus mainly a function of the institutional structures determined by policy-making at senior government levels and its most important constituents are effectiveness of communications across levels of government. Ideally, vertical communication across these boundaries should be a two-way process, leading to accommodation by higher levels to the needs of the lower levels as well as the reverse process. However, there is a potential conflict between exercising discretion and hierarchical control and this gives rise to questions about whether every layer within any given hierarchy has to be vertically integrated. Is hands-off management, the delegation of responsibilities and target-setting the right way to handle a complex system? If the purpose of vertical integration is to ensure that actions at every level are consistent with policies decided at the top level, what happens when things go wrong? Effective vertical integration often implies top-down control with some form of sanction imposed where higher level policies are ignored or flouted so that often the reaction is to restore the controls rather than examine faults at the top level.

Horizontal Integration

Horizontal integration takes place across departmental boundaries, for example the ideal, but so far patchy, integration between science and technology policy and social and environmental policies in the UK in the development of new approaches to governance. Integration in this case poses similar challenges to that of interdisciplinary research in academic organisations (Tait et al., 2002; Bruce et al., 2004).

Institutional structures are important here but they do not determine the effectiveness of integration. In the UK there have been numerous examples of amalgamation of government departments, with integration as one of the main aims, where the staff involved have continued to operate within their pre-existing boundaries, with little interaction across these old boundaries.

Communication is also important but the focus of the communication is different and it imposes different challenges. As with interdisciplinary research in academia, each policy area has its own specialist language and this leads to difficulties in effective communication across boundaries (Tait and Lyall, 2001). Likewise, career structures for public servants reward those who specialise and it is difficult to make a career by “trespassing” across traditional boundaries.

Most important, the impact of effective horizontal integration is a *loosening* of control and the introduction of greater complexity into policy implementation processes.

Horizontal policy integration, despite the importance we would attach to it, is therefore much more difficult to achieve than vertical integration. It cuts across the career structures of public servants, raises communication difficulties and lessens the ability of individual departments to exercise control in their own spheres.

The challenges exercised by horizontal policy integration and by interdisciplinary research in academia are similar in many respects, and interdisciplinary research itself has an important role in STI-related policy. To date, experience of interdisciplinary integration in FP5 has been mixed, but it is important that the EC learns from experience and adapts future programmes accordingly, rather than abandoning the experiment. Discussions with scientists who have worked in both Europe and the USA have led to the conclusion that America manages academic interdisciplinary integration much more effectively than we do in Europe, and this could be a significant component of their relative competitive advantage in many areas (Tait et al., 2002; Bruce et al., 2004).

These difficulties are related to the linearity of the assumed model of innovation. Current assumptions see “society” entering the picture as a market for the products of innovation at the end of the development pipeline, but not as a partner in their development. Innovative companies may engage in sophisticated market forecasting techniques, but they often have a very restricted understanding of what constitutes their market. Likewise, many of them fail to consider the policy environment into which their products will be launched. The current UK debate on the introduction of GM crops illustrates this point perfectly and raises questions about stakeholder engagement and the extent to which it is appropriate to involve society and at what stage (Tait, 1993; Tait et al., 2001).

Aims of the Book

Policy co-ordination may be the philosopher’s stone of modern government – “ever sought but always just beyond reach” (Bevir and Rhodes, 2003), but in attempting to develop new integrated approaches to policy for science, technology, risk and the environment, this book seeks to make the following contributions to this quest:

- to improve the quality of decision-making by developing integrated, interdisciplinary approaches to policy research and advice and engendering a better appreciation of the role of science in the policy-making process;

- to contribute to the pioneering of new approaches to policy development in the context of the Europe-wide debate on regionalisation;
- to consider the issue of policy integration from a regional, national and international perspective in order to foster the development of STI;
- to help policy-makers and practitioners see and interact with the broader picture while continuing to focus on their individual areas of expertise and responsibility;
- to share best practice and provide an introduction to the policy-making process for those new to this area.

Most aspects of government are joined up to some extent but our authors will try to address, for each of the policy areas identified above, questions about where they are joined up, to what extent, and where gaps exist where further integration might be helpful. The following chapters offer a range of perspectives from UK, European and international policy regimes. Some authors question the extent to which policy integration is achievable or, indeed, desirable.

Some might argue that “globalisation” has made the governance of technological change more difficult but Perri 6’s chapter which forms the second chapter in Part I argues that much depends on what expectations one has for the standard of governability. This chapter examines the ways in which technological risks, opportunities and the rise of new technology-based industries and the decline of technology-based industries are managed, first in the domestic and then in transnational contexts. Within these categories, the available tools for governance are considered, and their relative weight and interdependence explored. Perri 6 does not subscribe to the general trend toward deregulation, the decline of control and the rise of other instruments of governance, nor does he support the view that there is a general drift toward a “precautionary principle” which is being used to justify the resurgence of control methods. Instead, he suggests a much more complex picture where the tools of governance are always interdependent such that the resulting system of governance is best understood as a dynamic disequilibrium system. A central part of his argument is that we shall not understand how the governance of technology works nor how it could work differently, if we do not see the whole system: understanding better the relationship between the governance of risk, opportunity and decline is thus an important task for understanding the dynamics of governance.

Next, Spinardi and Williams draw attention to the dynamism, the serendipity and the unpredictability surrounding advances in scientific and technological knowledge and the implications that this has for policy-making. In their chapter, they argue that the turbulence of new fields of enquiry such as biotechnology and nanotechnology – so-called “breakthrough S&T” – presents new challenges for conventional science and technology policy. The innovation pathways and socio-economic outcomes of new technologies are often far removed from initial presumptions and a key challenge for research policy revolves around the assessment of the potential “coupling” between a new approach and a user requirement (either existing or to be created). Policy-makers therefore need to be

attuned to the significance of paradigm shifts in science and technology as these can, for example, call into question existing criteria for assessing technology, and expectations about its social and economic outcomes and implications. These uncertainties pose enormous difficulties for the governance of breakthrough S&T, where policy is charged with the task of supporting research that will bring profound advances in understanding, as well as with promoting the exploitation of new knowledge.

The second part of the book offers a number of case studies spanning a range of policy arenas related to science, technology and innovation. First, Reiss and Tait consider the performance of European countries in promoting the life sciences, along with a range of targeted and generic policy instruments adopted to support these aims. They examine a number of Foresight studies and their potential role as a mechanism for integration of STI-related policies and argue that the more sophisticated of these Foresight initiatives could begin to develop as mechanisms to illustrate how life science innovation will play a role in determining societal futures and also how scientific, technical and social aspects of life science innovation will interact with one another to determine the future shape of these industry sectors. Reiss and Tait suggest that, in order to achieve effective, integrated governance of the life sciences, policy-makers will need to strike an appropriate balance between promotion and regulation of innovation; between what is feasible technically and commercially and what is publicly acceptable and desirable; and to deliver the claimed societal benefits without challenging accepted societal norms. A consequence of this is that policy needs to be an active moderator, bringing together key actors and technologies, and leading to an increasing focus on networking.

Risk is a prime example of an issue that pervades policies across government and for which there is a recognised need for integration of policy-making. Risk issues do not as a rule map uniquely on to the policy remit of individual government departments, which gives rise to the possibility of lack of coherence and consistency of decisions in different policy contexts. McQuaid offers a former policy-maker's perspective on developing an integrated approach to risk, and uses the experience of the UK Interdepartmental Liaison Group on Risk Assessment (ILGRA) as a case study to draw some lessons pertinent to the operation of a largely horizontal mode of integration. His chapter highlights the importance of self-adaptation which requires an awareness of differences (and the contextual reasons for them) so that individual actors can then decide how to adapt in order to ensure joined-up working.

Next, Rennie looks at the special challenges facing issues of policy and governance from a rural perspective where policy domains span a range of sustainability issues (environmental, social and economic), set against the context of rapid agri-environmental changes, debates about land use and the overlapping bureaucracy relating to environmental protection. He describes how the rural debate has moved far beyond the immediate concerns of how much food farmers can produce, to encompass fundamental questions about how we envision our society to be, how we ensure a sustainable quality of life for all citizens, and what

role the rural environment plays in this bigger picture. The need to move from representative governance to more participatory structures, from policy issues that are solely top-down to those that reflect local and regional priorities within a national and international framework, will not be easy. He calls for simplification, integration, and re-prioritisation but at the same time rural development theories need to become more sophisticated, more holistic, and more balanced in their mix of quantitative and qualitative measurement of sustainable rural development for the forthcoming decades. Rennie also picks up the themes of vertical and horizontal integration, noting that the amount of re-thinking required in order to ensure both vertical integration (between central government and the peripheral regions) and horizontal integration between all policy areas that impact upon rural areas is a huge, and as yet barely addressed political challenge, but one that is central to the analysis of governance in the next few decades.

Policy-makers sometimes claim that transport policy is more “joined up” than many other policy areas. However, Adams argues that this claim usually refers to horizontal integration between infrastructure planning and transport policies and that there are no effective mechanisms, horizontal or vertical, for integrating the wider societal impacts into planning and transport policy-making. Adams suggests that connecting increasing mobility (“hypermobility”) to progress continues to guide transport and communications policy. In discussing some of the downsides of the hypermobile society, Adams challenges the popular notion of governance and concludes that bottom-up “governance” – as distinct from top-down government – is not possible in a fast-moving, anonymous, low-trust, paranoid hypermobile world.

Adams’ conclusion previews the theme of the third and final part of the book which begins to explore the limits to integration. Hertin and Berkhout’s chapter examines the issue of environmental policy integration and its relevance for a governance approach oriented towards the development of sustainable technologies. It draws on practical experiences with environmental policy integration in EU policy-making and provides an analysis of recent initiatives such as the EU Cardiff process, the Sustainable Development Strategy and the Impact Assessment procedure, to explore the opportunities for, and barriers to, environmental policy integration. These authors demonstrate that experience at the EU level shows that environmental policy integration has proven difficult in practice and that progress is hindered by the fact that initiatives have been developed in what appears to be an unco-ordinated process, characterised by hasty changes and superficial compromises. The process of integration has not yet been pursued in a strategic and co-ordinated way and has yielded a range of well-meant, but ad hoc arrangements that are, as yet, inadequate to the task. Significantly, environmental policy integration at the EU level is dependent on better integration in member states. In offering a number of insights into lessons for policy, Hertin and Berkhout raise the possibility that policy integration could be seen by some as a convenient rhetorical position taken up at the EU level that has little substance and merely represents symbolic politics or a deliberate strategy to water-down environmental policy. They conclude that integration requires realism and that,

without a dispassionate approach to the limits of integration, the whole project risks being little more than gestures and missed opportunities.

Murphy and Chataway's chapter considers some of the implications for governance and policy integration at the international level. Their chapter focuses on the international agreements and institutions that deal with the possible environmental or human health risks associated with trade in genetically modified organisms (GMOs) and shows how, with the emergence of the EU-US conflict over GMOs, these agreements and associated institutions were drawn into a complex international governance process. These authors suggest that, in some cases, lack of integration can be an outcome of governance and they argue that, in the case of GMOs, the absence of integration played an important role in the "management" of a conflict for a period of time, because of the political possibilities created by it. This chapter suggests that there are considerable risks associated with assuming that policy integration is always a good thing. From Murphy and Chataway's perspective, governance is a complex process involving the interaction of multiple stakeholders, often with different definitions of "the problem", in numerous fora at different political levels and is unlikely to be compatible, practically and theoretically, with the idea of integration.

Having considered a range of policy-relevant problems in a variety of application areas – life sciences, risk analysis, rural policy, transport, environmental policy and international trade agreements – our final chapter reflects on the reasons why new policy approaches are required. Drawing on examples from the preceding chapters, the final chapter considers both the role of evidence in policy-making and the place of stakeholder engagement in the new governance agenda and concludes by discussing the feasibility and desirability of policy integration within the new mode of governance for science, technology, environment and innovation.

References

- 6, P. (1997), *Holistic government*, London: Demos.
- 6, P. (2004), Personal communication.
- 6 P., Seltzer, K., Leat, D. and Stoker, G. (2002), *Towards Holistic Governance: the New Agenda in Government Reform*, Basingstoke: Palgrave.
- Bache, I. (2003), 'Governing through Governance: Education Policy Control under New Labour', *Political Studies*, **51**(2), pp.300-314.
- Better Regulation Task Force (2003), *Scientific Research: Innovation with Controls*, London: Cabinet Office.
- Bevir, M. and Rhodes, R.A.W. (2003), *Interpreting British Governance*, London: Routledge.
- Bruce, A., Lyall, C., Tait, J. and Williams, R. (2004), 'Interdisciplinary Integration in Europe: the Case of the Fifth Framework Programme', *Futures*, **36**(4), pp.457-470.
- Cabinet Office Performance Innovation Unit (2000), *Wiring it Up. Whitehall's Management of Cross-cutting Policies and Services*, London: The Stationery Office.
- Cabinet Office Strategic Policy Making Team (1999), *Professional Policy Making for the Twenty First Century*, London: Cabinet Office.

- Commission of the European Communities (2001), *European Governance: a White Paper*, Brussels: Commission of the European Communities.
- Cooke, P., Boekholt, P. and Todtling, F. (2000), *The Governance of Innovation in Europe. Regional Perspectives on Global Competitiveness*, London: Pinter.
- Davies, H.T.O., Nutley, S.M. and Smith, P.C. (eds) (2000), *What Works? Evidence-Based Policy and Practice in Public Services*, Bristol: The Policy Press.
- DTI (1998), 'Our Competitive Future: building the knowledge driven economy', White Paper Cm 4176, London: DTI.
- Eidler, J., Kuhlmann, S. and Smits, R. (2002), 'New Governance for Innovation. The Need for Horizontal and Systemic Policy Co-ordination' in *New Governance for Innovation? The Need for Horizontal Policy Co-ordination*, Karlsruhe: Fraunhofer ISI.
- Giddens, A. (1998), *The Third Way: the Renewal of Social Democracy*, Cambridge: Polity Press.
- Giddens, A. (1999), BBC Reith Lectures 1999, http://news.bbc.co.uk/hi/english/static/events/reith_99/.
- HM Government (1999), *Modernising Government White Paper*, London: The Stationery Office.
- Ince, M. (1986), *The Politics of British Science*, Brighton: Wheatsheaf Books.
- Kooiman, J. (1993), *Modern Governance. New Government-Society Interactions*, London: Sage.
- Lyall, C. and Tait, J. (2004), 'Foresight in a Multi-level Governance Structure: Policy Integration and Communication', *Science and Public Policy*, **31**(1), pp.27-37.
- Newman, J. (2001), *Modernising Governance. New Labour, Policy and Society*, London: Sage.
- Pierre, J. and Peters, B.G. (2000), *Governance, Politics and the State*, Basingstoke: Macmillan.
- Rhodes, R.A.W. (1997), *Understanding Governance. Policy Networks, Governance, Reflexivity and Accountability*, Buckingham: Open University Press.
- Ronayne, J. (1984), *Science in Government*, Caulfield East Victoria: Edward Arnold (Australia).
- Sloat, A. (2002), 'Governance: Contested Perceptions of Civic Participation', *Scottish Affairs*, **39**(Spring), pp.103-117.
- Stoker, G. (1998), 'Governance as theory: five propositions', *International Social Science Journal*, **50**(155), pp.17-28.
- Tait, J. (1993), Written evidence on behalf of ESRC to Report of House of Lords Select Committee on Science and Technology on Regulation of the United Kingdom Biotechnology Industry and Global Competitiveness, 7th Report, Session 1992/93, London: HMSO.
- Tait, J. and Bruce, A. (2004), 'Global Change and Transboundary Risks', in T. McDaniels and M. Small (eds), *Risk Analysis and Society: an Interdisciplinary Characterisation of the Field*, Cambridge University Press, pp 367-419. (Commissioned by Society for Risk Analysis for the International Symposium on *Risk and Governance*, Warrenton, VA, USA, June 2000.)
- Tait, J., Chataway, J. and Wield, D. (2001), PITA Project (Policy Influences on Technology for Agriculture: Chemicals, Biotechnology and Seeds) Final Report. <http://www.technology.open.ac.uk/cts/pita/>; <http://www.supra.ed.ac.uk/Publications/paper22.pdf>
- Tait, J., Chataway, J. and Wield, D. (2004), 'Governance, Policy and Industry Strategies: Agro-biotechnology and Pharmaceuticals', Innogen Working Paper 12; http://www.innogen.ac.uk/ownPubs/Innogen_paper_12.pdf

- Tait, J. and Lyall, C. (2001), *Investigation into ESRC-funded Interdisciplinary Research*, Report to ESRC. http://www.supra.ed.ac.uk/Publications/ESRC_report_Interdisciplinary_research.pdf
- Tait, J. and Williams, R. (1999), 'Policy Approaches to Research and Development: Foresight, Framework and Competitiveness', *Science and Public Policy*, **26**(2), pp.101-112.
- Tait, J., Williams, R., Bruce, A. and Lyall, C. (2002), *Interdisciplinary Integration in the Fifth Framework Programme (II-FP5)*, Report to EC (Accompanying Measure SEAC-1999-00034). http://www.supra.ed.ac.uk/Publications/FINAL_REPORT.pdf