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## Transparency, openness and participation in science policy processes

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Ours is a society that has relied since the Enlightenment era on a wide belief in science as a 'good' within it. The same can be said for technology. Modern ideology saw science as the road to truth and technology as a source of growth and welfare.

There is no doubt that faith in technology has eroded in recent years as rapid and profound changes pervade its social environment. These changes are manifest in:

- The growing public perception of industrial and technological risk, particularly food and environmental risk
- The proliferation of instances of social resistance to science-based products and activities
- Claims by social organisations and by social movements for active participation in the management of technological and ecological risk

Science has also become the focus of critical assessment. At present, science finds itself at a crossroads. On the one hand, scientific knowledge is greatly respected, as it has always been, as a source of information and culture, and as the provider of solutions both for technical and for social problems. On the other hand, science is losing its aura of neutrality and objectivity, and is raising growing ethical concerns (especially in the biological and medical sciences). Furthermore, in recent decades, scientific and public, media-driven, controversies (climate change, BSE, GMOs—to name just a few) reinforced public awareness that experts can and do disagree, and that their opinion is frequently influenced by professional, economic or political considerations.

The critical social climate surrounding the production and uses of scientific and technological knowledge nowadays provides the background for the increasing attention paid, in academic and political spheres, to the images of science in public opinion. The older concern about the levels of scientific and technological literacy of citizens is now combined with a new apprehension about the social acceptance of scientific and technological innovation (the ‘public understanding of science and technology’). Politicians are, by the same token, confronted with new, hard problems—the need to respond to people’s concerns on the impacts of scientific and technological progress, and to the danger of paralysis of decision-making processes. In Europe, in the aftermath of the BSE and GMO crises, a wide debate was launched and concrete reforms have been undertaken on the uses of science in policy-making. This debate became central to the larger discussion on new modes of governance.

In this context, scientists and scientific institutions are called on to cope with more than their traditional missions. They are expected to:

- Contribute to technology and economic development
- Give reliable advice to both public and private organisations
- Promote the public understanding of science
- Assume a renewed sense of social responsibility.

Nowotny *et al.* (2001) summarised these challenges by saying that ‘scientific knowledge must be not only reliable but also socially robust’ and that ‘the context of implication must be addressed, as well as the context of application’ of the results of scientific research. What is meant by these statements is that the impacts of technology and science in society imply consulting other knowledge producers and users, and wider social constituencies about the implications of particular projects in order to gather a diversity of perspectives.

One can draw two corollaries here:

- That there should be a deliberate strategy by scientific institutions to identify and articulate the consequences of their research projects and activities
- That mechanisms should be devised at the level of public and private institutions to enable external entities to become more actively involved in the processes of knowledge production, and by the same token to enable their needs and requirements to be taken into account, in functional, as well as in social and ethical terms

But to what extent have these novel ideas translated into effective action?

The following chapters offer interesting insights into the actual practices, as well as the difficulties, of opening up science–policy processes and, more generally, science-based decision-making, to actors external to the scientific and technological systems.

## Opening up science–policy processes

The initiatives launched, in recent times, by the European Union (EU) within the framework of its research policy to address science–society relationships provide a starting point for discussing new forms of governance of science and innovation.

While stressing the need to stimulate and support public awareness and the diffusion of science in society, the European Commission concedes in *Science, Society and Citizens in Europe* (CEC 2000) and in the first *Science and Society Action Plan* (European Commission 2001) that a two-way dialogue between science and society is required ‘where each listens as much as talks’. The importance of ‘democratising expertise’ is also acknowledged.

According to the *Science and Society Plan*:

people must become more familiar with science and technology. It will be essential . . . to give science and technology a higher profile in the media and education in Europe to stimulate young people’s spirit of enterprise and whet their appetite.

The media, researchers, research institutions—in particular universities—as well as industry must play their public information role to the full. They must be capable of communicating and engaging in debate on scientific issues in a rigorous and comprehensible professional manner, as well as explaining frankly the benefits and limitations of scientific progress.

The relationship between science, technology and innovation, on the one hand, and society, on the other, must be reconsidered. Scientific activities need to centre on the needs and aspirations of Europe’s citizens to a greater extent.

In a Communication on the Collection and Use of Expertise (European Commission 2002), published as a follow-up to the Action Plan, the European Commission also recognised the difficulties involved in the use of science in policy-making:

Recent history—from BSE to GMOs—has shown that difficult policy decisions must sometimes be made on contentious issues in the face of significant uncertainty . . . The Commission might be confronted with a panoply of conflicting expert opinions, coming variously from within the academic world, from those with practical knowledge, and from those with direct stakes in the policy issue.

And it concludes:

Increasingly, then, the interplay between policy-makers, experts, interested parties and the public at large is a crucial part of policy-making, and attention has to be focused not just on policy outcome but also on the process followed.

Based on these premises, the Action Plan lists a number of actions to be taken by the European Commission. But it also admits that, in European research policy, ‘systematic and structured participation has most recently centred on expert advisory groups’

(European Commission 2001). Therefore, their interests have shaped the contents of the policy.

In reality, research and development policies have until now largely reproduced and consolidated the separation between science and the citizens, which finds its roots in modern ideology. As recalled by Beck (1986): ‘claims of scientific rationality to knowledge and enlightenment are . . . spared from scientific scepticism to themselves’. Modernity conceived of science as a space of individual freedom and autonomy of the scientists—a somewhat private and closed sphere. In contrast, citizenship, as the legal framework of individual participation in a political democracy, was to be exercised in the public sphere.

However, such a limited attention to the science–society interface appeared more and more problematic at a time when public expectations and concerns towards science and scientific applications grew, together with claims for democratising knowledge.

The *Science and Society Plan* indeed recognised that:

If citizens and civil society are to become partners in the debate on science, technology and innovation in general and on the creation of the European Research Area in particular, it is not enough to simply keep them informed. They must also be given the opportunity to express their views in the appropriate bodies.

The question thus turns out to be whether research policy making should be open to the public (stakeholders, NGOs, citizens at large), and, if the answer were ‘yes’, in what ways.

Against this background, one might be surprised with the text of the Draft Treaty Establishing a Constitution for Europe (2003),<sup>1</sup> which, though rejected in the French and Dutch referenda, remains an important reference document. In Part II, the Charter of Fundamental Rights, there is only one article referring to science: ‘The arts and scientific research shall be free of constraint. Academic freedom shall be respected’ (Article II-13).

Part III (Articles III-146 to III-156) deals with research and development policy. The language of these provisions follows closely that of previous treaties. It focuses on the creation of the scientific bases for industrial competition in Europe combined with a general reference to research actions judged necessary to the fulfilment of other chapters of the Draft Treaty. The procedures for the approval of programmes continue to assign a central place to research centres, universities and enterprises. There is not a single reference to other social actors as interested partners in science–policy processes.

It is true that principles contained in Title VI of the Draft Treaty on the democratic life of the Union and, in particular, the principle of participatory democracy (Article 46) might be interpreted as applying to the field of research and development policy. Notwithstanding, the absence of an explicit mention of the openness of science–policy processes is a sign of indifference to such an important contemporary challenge.

The next chapter, by Sybille van den Hove and Martin Sharman, offers an illustration of a practical experiment at the science–policy interface: the European Platform for

1 [europa.eu.int/constitution/futurum/constitution/index\\_en.htm](http://europa.eu.int/constitution/futurum/constitution/index_en.htm)

Biodiversity Research Strategy, which tells us something about the opportunities and the shortcomings of developments in this area. This platform is an informal forum where scientists and policy-makers discuss strategies for research in the field of biodiversity. Its outputs take the form of recommendations on themes and topics for research programmes and projects, one of the envisaged targets being the EU research framework programme. As the authors point out, the platform is designed to become the 'European voice in biodiversity science policy'. Yet, in reality, it appears to remain no more than a consultative mechanism for the exchange and discussion of knowledge for policy.

Sybille van den Hove and Martin Sharman discuss participation and communication as 'procedural challenges' for the platform. Key groups involved are, in reality, policy-makers and scientists—little space being granted to other stakeholders such as NGOs. Participation indeed seems to be equated with transparency: enabling access to information and to interaction by the scientific community and all other interested parties through electronic communication. The chapter recalls that NGOs were, occasionally, left outside meetings of the platform due to explicit refusal by some governments to allow them to attend. Though the authors favour the informal and flexible features of the platform, one wonders whether clearer procedural rules would not be desirable for true participation and, ultimately, for more legitimacy to be achieved. The platform also appears to have been struggling for the right balance between gathering good and appropriate expertise. Prevalence was first assigned to biologists, but the need is now recognised for other disciplines, including the social sciences, to be associated with it.

Communication, in turn, is dealt with by the authors mostly as an issue of ensuring mutual understanding between politicians and scientists in the context of negotiations within the platform. Beyond seizing the respective messages, a crucial issue seems to be the disclosure of the implicit or hidden agendas of the partners.

According to the authors, the European platform 'exemplifies new forms of participatory environmental governance'. While the platform surely provides a transparent framework for more regular and intense exchanges between experts and policy-makers, it is far from clear whether true participation is really achieved—if by the latter we mean the effective involvement of all relevant stakeholders in the discussion and shaping of research policy choices.

While in science policy-making, openness to entities other than the conventional ones remains at an embryonic stage, developments in other fields of science-based public policy have gone farther. Environmental and consumer risk policy and management are in that respect paradigmatic.

## Rendering science-based decision-making more participative

From the outset, public participation beyond the framework of political and representative democracy has been shaped by environmental policies and debates. From the 1970s onwards, growing ecological awareness and activism furthered the establishment of legal rules for access to information and public consultation, as well as the

building-up of innovative procedures to support decision-making (citizens' panels, consensus conferences, etc.). Nevertheless, the stipulation of rights of access to information, to be consulted and participate in administrative procedures, and rights of access to justice in this specific policy domain, as well as the institutionalisation of novel procedures such as preliminary environmental impact assessment, appear to have been originally motivated by the aim of legitimising political decision rather than to better inform it or to promote a more democratic society.

More recently, against the background of the BSE and GMO controversies, the EU undertook a profound reform of its institutions and procedures for food regulation and consumer protection. This reform was guided, in a central fashion, by the will to guarantee safety and precaution towards risk, and to restore public confidence in the regulatory system and in its expert base. Institutional and procedural reforms in the fields of risk launched by the EU have been predicated on the argument that legitimacy and trust will result from ensuring institutional independence from vested interests of expert risk assessors and policy-makers, transparency of decision-making, as well as explicit engagement and dialogue with a broader range of stakeholders.

But who is actually representing the 'risk society'? Are conventional economic and market-oriented evaluations being well balanced against public perceptions, ethical standards or cultural considerations? Are innovation processes in themselves being subject to the obligations of transparency, openness and involvement? In other words, is truly democratic governance of technology and innovation occurring?

The advisory system existing at the time of the outbreak of the BSE crisis was strongly criticised for its opaqueness and lack of accountability. The entire system for scientific advice in the field of consumer and health protection was reformed in June–October 1997 when a Scientific Steering Committee and eight new Scientific Committees were established to replace former Scientific Committees. These new bodies received a broader mandate.<sup>2</sup> Eventually, this process led to the establishment of the European Food Safety Authority (EFSA).<sup>3</sup> The EFSA now incorporates the whole scientific advisory structure in this area.

The main functions of the EFSA are to:

- Provide scientific advice to the EU
- Monitor risks
- Communicate these risks to the public

EFSA's missions include that of guaranteeing 'that the public and interested parties receive rapid, reliable, objective and comprehensible information'.<sup>4</sup> Food business operators are also encouraged to inform consumers.

In parallel, rules were established with respect to the deliberate release of GMOs for market or other purposes. Directive 2001/18/EC<sup>5</sup> stipulates that persons submitting a

2 Commission Decision 97/404/EC (1997), Commission Decision 97/579/EC (1997).

3 Regulation (EC) No. 178/2002 of the European Council and of the Parliament; [europa.eu/eur-lex/pri/en/oj/dat/2002/l\\_031/l\\_03120020201en00010024.pdf](http://europa.eu/eur-lex/pri/en/oj/dat/2002/l_031/l_03120020201en00010024.pdf), 4 July 2006.

4 Article 23 j and Article 40 of Regulation (EC) No. 178/2002.

5 [europa.eu.int/smartapi/cgi/sga\\_doc?smartapi!celexapi!prod!CELEXnumdoc&lg=EN&numdoc=32001L0018&model=guichett](http://europa.eu.int/smartapi/cgi/sga_doc?smartapi!celexapi!prod!CELEXnumdoc&lg=EN&numdoc=32001L0018&model=guichett), 4 July 2006. This directive was modified by Regulation (EC) No. 1829/2003.

notification for that purpose are obliged to carry out a prior environmental impact assessment, whose principles are detailed in one annex to the directive (Article 4 and Annex II). Consultation of the public and of interested groups is an integral part of the authorising procedure (Article 9).

Two important features can be observed from this brief overview of the European approach to risk governance in the health and consumer domain. The first is that the scope of the assessment and management procedures centres on the impacts and risks of industrial and technological innovation, rather than on innovation per se, as a process that develops inside the company from the preparatory phase of research and development to the investment decision and the production phase. Thus, the function or utility of innovation and, ultimately, the need itself for the product or the technology, escape political and public scrutiny or debate. Whereas the placing of a manufactured good into a market may be subject to prior evaluation, the internal dynamics of industry and knowledge production therein are left in the dark (Gonçalves 2006).

The second is that the EU seeks to recover public trust and legitimacy mainly via two channels:

- Restructuring the provision of **scientific expertise**
- **Risk communication**

Soundness and independence of expertise is sought by means of a procedure whereby experts openly submit their applications to join the expert committees in response to calls for expressions of interest, combined with strict rules to avoid conflicts of interests. Transparency is ensured through disclosure of the agendas and proceedings of expert committees and, more generally, of expert opinions.

Nevertheless, availability of information does not in itself guarantee social control. On the contrary, risk communication may be viewed as a subtle way of sharing the responsibility for the management of the risk with the would-be consumer or user. To Bauman (1993), for example:

risk information aimed at lay public and passed over the members of the public in the form of 'DYV survival kits' has an overall effect of a counterfactual privatisation of risks.

Risk communication is the means resorted to by some industries as a public relations exercise to promote the trade of potentially risky products. Moreover, risk communication relies primarily on knowledge provided by experts. Effective communication will, therefore, depend on the quality of the dialogue and on mutual understanding between experts and the public such that the expert–lay divide can be overcome.

The question, then, remains: to what extent does a strategy centred on scientific expertise and risk communication allow opportunities for effective popular involvement and scrutiny of technological development? The search for new modes of governing technology and industry that are effectively transparent and open indeed appears to conflict with the principles and rules that guide our market economic systems.

## Beyond science–policy processes: market rules and participation

Intellectual property rights account to a great extent for the power of business enterprises to maintain their control over knowledge production and diffusion. To these constraints, one should add the restrictions on scientific freedom and autonomy imposed on researchers who work under contract with the industry.

The analysis of biotech patents as a case of co-production between science and the law, undertaken by Emanuela Gambini in Chapter 12 gives us evidence of current debates and trends in the field of intellectual property rights. Since they grant to inventors a monopoly on the results of their intellectual creative effort, patents are generally considered a necessary condition for scientific and technological progress. However, as pointed out by the author, inventions nowadays are quite different in their nature and impacts from what they were in the past. The individual inventor has generally been replaced by the big company. Therefore, the patent loses its supposed neutrality. Essentially, it represents a way to control market shares.

Emanuela Gambini also underlines the propensity of the biotech industry to replace patents by other means (e.g. technical devices and regulatory or contract controls) to protect its knowledge. In addition, many countries have imposed restrictions on the monopolies of inventors with a view to promoting the use of the patented product or information. The author favours this move. But she goes further as she argues for the expansion of the scope of public domain with respect to biotechnological inventions—a goal that may remain somewhat unrealistic for the years to come.

Gambini's chapter provides us with an illustration of the interface between science and the law in the definition of new biotech items as legally protected matter. The trend of extending patent protection to living matter has relied on a dialogue between legislators and the courts on one hand, and scientific experts on the other. The author questions the decisive part played by science in the shaping of the concepts underlying the legal protection of biotech knowledge to the extent that it has the effect of excluding citizens; or, more precisely, of preventing citizens from access to information, and any kind of influence on a matter that is more and more crucial for their well-being. Contrary to its traditional exclusive features, the patent system itself thus became involved within the social demands for science's democratisation.

Whereas, as pointed out above, principles of openness and transparency are indeed pervading the policy and regulatory worlds, the realm of the market remains a black box to a significant extent. A fact that is often overlooked: from the first to the second modernity—in other words, from industrial to post-industrial society—no real change occurred in the economic system's structure and rules (Bauman 1993; Lacy 2002).

Yet this seems to be a paradox at a time when the market is expanding and escaping state control under globalisation trends and when market externalities (both in positive and negative terms, including risk) are more and more a matter for public apprehension.

The widening of the scope of governance, as well as the role of citizens in it, becomes a democratic imperative in these circumstances.

Against this background, the search for appropriate benchmarks for the assessment of the quality of participation exercises looks more and more relevant. In their contri-

bution in Chapter 13, Jacquelin Burgess and Judy Clark seek to evaluate, with the help of 17 interviewees, public and stakeholder engagement strategies in environmental governance in England and Wales in the light of criteria developed through the application of a multi-criteria mapping technique. The result is a set of categories of qualitative criteria and their multifaceted meanings. The latter were designed to assess the degree of a 'close and responsible relationship' between the Environment Agency and its public and stakeholders. The criteria related to:

- The democratic or 'fair' features of the relationship (learning as mutual understanding, transparency, supportiveness, openness, respect)
- Its contribution to better and more effective public decision (learning as a way of acquiring information and competencies; productiveness; efficiency)

The authors point out that the search for a robust set of theoretically and empirically solid criteria by which to evaluate participatory processes has followed the expansion of innovative governance strategies. The comparison with other studies along similar lines leads them to raise the question of the balance between fairness and efficiency in participatory procedures. Pursuing efficiency has become more acute as participation pervades a wider range of public policy arenas, and enters the decision-making processes at earlier stages, the authors conclude. Though cost-effectiveness of procedures is no doubt a criterion that cannot be disregarded, disproportionate emphasis on it may at the end of the day jeopardise its acceptance by stakeholders and the public.

Lessons drawn from this sort of analysis are of much value for the European Union which is expected to play a key role in expanding the use of participatory tools and in rendering them effective both in the science–policy sphere and in science-based public policy-making. The adequate design of participatory procedures is indeed a necessary condition for a trustful interface between science and society in Europe.

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