Seminar "Scientific Advice and Policy Making: Where Are We Heading?"
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Lessons learned and lessons to learn

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Seven observations on scientific advice and policy-making

The present situation facing both policy-makers and the scientific experts who either seek to advice them or are invited to do so, is very different from the historical circumstances that are reconstructed in Henry Etzkowitz' keynote paper. I want to single out seven characteristics that, although they can combine in different configurations and have arisen under conditions that cannot be analyzed here, together frame the challenges that science policy advice pose today.

First, the ST&I content of the policy-making process continues to increase. This has been often noted to be the case for the regulatory process and accompanying laws and legal procedures. Moreover, policy-making itself is subject to make better use of available scientific and technical information, data, statistics, scenarios and models, and the way of arguing, presenting and reaching conclusions that go with it and ought to resemble scientific reasoning. The repeated call for *evidence-based* decision-making is just one, although a prominent, case in point. Far less often discussed are questions and assumptions that precede the definition and collection of what counts as evidence or how the demand for specific advice is framed from the beginning. What *is* the relevant policy question for which advice is needed?

One of the consequences of the increase in ST&I content and hence the increase in demand for more scientific and technical advice is the paradoxical fact that expert advice is accompanied by greater contestation. In a pluralistic democratic society that is rapidly transforming into a knowledge society, contestation of advice – and above contestation of advice the recommended course of action and decisions – is unlikely to subside.

The call for a democratization of expertise masks an important lesson: given the complexity of the problems and the policy process for which advice is being sought, it is unreasonable to expect that scientific advice can consist in offering one, and only one, recommended course of action. Rather, scientific and technical expertise is called upon to come up with a number of *policy options,* each of which must be put and assessed in its proper context.

Second, the interconnectedness of policy processes has progressed to such an extent, that the major problems cannot be seen in isolation from the various levels of governance. This holds especially for decisions taken on the national level, which depend – and interact strongly – with those taken at local and regional level as well as in the transnational realm. Increasingly, the EU, despite restricted competence in many domains, attempts to push member states towards greater harmonization of their regulatory frameworks in ST&I policies, sets up comparative exercises like bench-marking and best practice. This holds, of course, even more for transnational policy areas that are dealt with by bodies like the WTO.

This increased interconnectedness results in the fact that standard setting plays a larger role in the policy process. Standards are usually technical in nature, but they need close monitoring and recurrent revision to keep up with actual and state-of-the art practice. Standards, once they have been set up, therefore tend to diminish the number of available options for policy-makers, but the process of setting them up can be very challenging.

Third, the ST&I domain has strong links with other policy domains, although these may often be indirect and difficult to proof. One case in point is the increase of investment into R&D, and even more, investment for basic research, and the effect it has on economic growth or job creation. All that can be said with certainty is that a lack of investment will have negative consequences for growth. The interlinkeage with other policy areas and increasingly with the support – or lack thereof – by the public, highlights that a too narrow conception of ST&I advice risks to ignore the strong interdependencies between RD&I and decisions made in other domains that impact a research-friendly environment, i.e. taxation, availability of venture capital, public support, education policy etc.

It follows that science-policy advice must increasingly take factors into account that often cannot be influenced directly by the policy-maker in

charge. It is therefore important to come up with visions – and decisions - that are more transversal and socially encompassing.

Fourth, it has become obvious that most of the problems that arise cannot be approached in a mono-disciplinary way. The desperate cry "The world has problems, the university has departments" points to a real dilemma that even the most well-intentioned and well-equipped scientific adviser faces: how to *integrate* scientific and technical expertise that comes from different disciplines but is based on different assumptions and expressed in different languages.

What follows from this is the need to revamp university curricula, not only to encourage inter-,multi- or transdisciplinarity, but even more important to teach methods and ways of thinking that allow for the *integration of knowledge* coming from different disciplines.

Fifth, the competence, boundaries and transnational connections of state and market have changed dramatically in the recent past. While the New Public Management attempts to import market-derived norms into the state bureaucracy, the state has adopted new modes of governance in many areas relying on more self-organization and on contractualization. Scientific policy advice has to take this altered configuration into account, since neither the state nor the market will be able to affect desirable changes alone.

As a consequence, the circle of policy-makers to whom advice is given, has to be widened beyond the traditional political decision-makers. The advice will increasingly have to include partners whose cooperation is indispensable if the goals are to be reached.

Sixth, as many controversies about real or alleged risks associated with new scientific and technological developments have shown, policy-makers must take public opinion and the demand for more deliberative or participatory procedures into account. But who advises the public? To what extent can scientific experts be trusted by lay persons/citizens if what is at stake is not so much the technical or scientific substance (as many scientists wrongly believe), but rather the degree and kind of accountability and responsiveness of science and technology towards wider society?

While it seems easy enough to separate experts from lay persons, the role of the scientific experts in public controversies is far from clear. Scientific

experts are then often seen as just another interest group. In a pluralistic society they can speak ‘to’ members of the public, but can hardly claim to speak ‘for’ them.

Seventh, the relationship between what is perceived and/or defined as the ‘problem’ and the policy options that are (or should be) offered as ‘solution’ has not received sufficient attention. Given the inherent complexity of major problems and the uncertainty that surrounds the effectiveness and long-term consequences of the ‘solution’, the process of *integration* of advice again is crucial. Integration refers to expertise and knowledge coming from different domains, disciplines, and kinds of expertise. It also points to the necessity of embedding advice into the proper context in which the policy process operates, its temporal and other constraints.

What follows is the need for a more integrative framework of thinking and a methodology that can render it empirically more robust.

Who are the advisers and who is offered advice?

It is no coincidence that much more is known about the advisers than about those to whom advice is offered (and who may or may not use it). Supply seems to exceed demand, especially when it comes to actual use. Thus, the effectiveness of scientific advice is continuously overrated. In his recent book, Roger Pielke jr. distinguishes between four different roles and models of the scientific adviser. They range from the ‘pure’ scientist, the arbiter and the issue advocate to the ’honest broker’(Pielke, 2007). Although the latter clearly is his ideal, Pielke acknowledges that structural factors limit the role of science advisers, especially in the context of US presidential decision-making. Pielke also makes the point that scientists in government need more effective means to elicit from decision-makers the policy-relevant questions that need to be addressed by scientific and technical experts, as shown by the experience of the (now defunct) Office of Technology Assessment.

In a previous article I have emphasized the inherent transgressivity of expertise (Nowotny, 2000). Experts are asked and offer advice that inevitably reaches beyond the boundaries of their certified knowledge base. Their special competence and the knowledge at their disposal is to be applied in a new, often unprobed context. They must respond to issues and questions which are never ‘only’ scientific and technical. Even if some

situations in which advice is needed may resemble each other, history shows that there is no exact repetition. Therefore, changes in the decision-making structure of liberal Western democracies and in the knowledge production system tend to diminish the authority of scientific expertise, while increasing the context-dependency of expertise. The nature of the predictive claims of scientific expertise is thereby altered.

Advice based on scientific expertise is often offered in a collective voice. In part, this follows from the limits of competence of the individual expert, which calls for a wider base, grounded in a collective pool of experts and expertise. The collective voice is organized in a formal structure, usually committees whose members have been officially appointed and who are expected to remain neutral, disinterested and integer in their function. But individuals still matter, both inside such committees and outside. Scientific advice may adopt an informal, unseen voice. Usually, it is an individual scientist who holds a special relationship of personal trust with the policy-maker whom he/she advices. Formal, collective advice is public and the contributions from its broad, diverse membership act as assurance that its views are both, sufficiently encompassing (‘the wisdom of the crowd’syndrome) and serving the common interest. In contrast, the advice given by the trusted scientific adviser remains often shielded from public view, perhaps only later to be uncovered by historians.

The addressees of advice, the policy-makers, are potentially a very large and heterogeneous group. They range from powerful office-holders to cover the entire state administration and private enterprise. What stands out from those dramatic cases in which scientific and technical advice was crucial and urgent, like coping with the radioactive fall-out after the Chernobyl accident or the BSE crisis, is the fact that different ministries were drawing on different kind of advisers and expertise. The most recent example of such a ‘split’ advice, where no attempt even has been made at integrating advice coming from different sources, is the European Commission’s policy regarding biofuel as a means to combat climate change.

A short reflection on personal experience

From 2001 to 2006 I had the privilege to be Chair of EURAB, the European Research Advisory Board. Set up by the European Commission, EURAB’s mandate was to advise on all matters relating to its RD&I policy. EURAB consisted of 45 members, half of whom came from academia, the other half

from industry. As a matter of fact, our advice was aimed particularly at DG Research, although other DG's were also implicated in our recommendations. In the beginning, members of EURAB were anxious to preserve their 'independence' and 'autonomy' from the Commission, a realistic concern that arose from the experience of previous advisory bodies the Commission had set up, the last of which had dissolved itself. Over time, a good working relationship developed with the Commission staff and we were in a position not only to offer 'our' advice, but to listen to (and to elicit as much as we could) 'their' policy-relevant concerns.

EURAB's strength was that it succeeded in speaking with one voice. Having a distinguished membership both from academia and European industry thus gave our recommendations some weight. But what I came to call the 'advisers dilemma' remained: if we were too independent and aloof from those to whom we offered advice, our advice fell on deaf ears or would be irrelevant, because it did not address the real concerns. If, on the other hand, we came too close in identifying with the Commission, our advice would inevitably become coloured by its views and outlook. It would become irrelevant, this time because it did not make any difference.

A plea for the openness of social systems and our common future

Finally, for the sake of the general discussion, I want to quote from my book on "Insatiable Curiosity: Innovation in a Fragile Future". (pp.165-167)

"The future and the people of tomorrow are still primarily conceived in utopian and dystopian images whereby utopianism makes use of the genre of scientific-technological visions and their unconditional enthusiasm while dystopianism prefers the literary or artistic narrative form and posits that things are headed for catastrophe. But both the scientific-technological visions and their complement, the dystopian images of the future, attempt to suppress the ambivalence of modernity. This ambivalence teaches us that the people of tomorrow will no longer be the people we know today. Nor will they be cyborgs and androids, the hybrid figures of science fiction, who fascinate us because we do not know the ways in which they resemble and differ from people like us. To understand them, we must put ourselves in their place and estimate the possible effects of our actions on them. In this way, we make another of the many attempts in history that have been made to find a foundation for our own behavior—a foundation that asks what the nature of our positive, meaning-creating dependence on others is and what

we owe them in the light of this bond. Ultimately, this is the only way we can be self-determining and know who we, the people of today, are. If we want to conceive the future outside of the categories of utopia and dystopia, we have to start out from the people of today.

Technological systems require a degree of compatibility in their standards and components that the social systems cannot have because they must remain open. We expect that technological systems must be foreseeably reliable and secure. Only then are the selected technological solutions stable enough to solve the problems posed to them. By contrast, social systems—and societies—constitute themselves from their members' knowledge of each other. They are not subject to any process of closing and must remain in continuous openness. We know what the world's top scientific laboratories are working on today, and yet at best this allows us to derive scientific-technological visions that fit within a system that has been made to be consistent within itself. These visions can say next to nothing about forms of social organization, mutual relations among people, and emotional energies that the people of tomorrow will invest in ideas for or against each other or in things and institutions whose continuity they believe in. This lack of social knowledge makes these technological visions blind, even if they are able to gauge a limited number of "impacts"—of foreseeable effects whose corresponding consideration ought to be self-evidently a component of the process of generating technology. For as John Maynard Keynes remarked, the unavoidable never happens, while the unexpected always occurs."

Helga Nowotny (2000) "Transgressive Competence. The Narrative of Expertise", European Journal of Social Theory, 3(1) 5-21.

Helga Nowotny (2008) Insatiable Curiosity: Innovation in a Fragile Future. Cambridge, Mass: The MIT Press.

Roger Pielke, jr. (2007) The Honest Broker: Making Sense of Science in Policy and Politics. Cambridge: Cambridge University Press.