

## **The Role of Technology Assessment in the Biotechnology Debate in Germany**

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As in other industrialised countries, Technology Assessment (TA) was introduced in Germany as an instrument to foresee the consequences and to mediate in conflicts of technological decisions. As a social scientist who has been working on biotechnology and as an activist in the political debate on that theme, I will focus my analysis on the transformation of the genetic engineering debate in Germany within the framework of TA.

For social and environmental pressure groups TA might be a channel to address their claims. But on the other hand they might be absorbed in the labyrinths of the mere technical details without any political results. So I will also discuss criteria surrounding the question of whether or not they should participate in these procedures.

### **The state of TA implementation in Germany**

The attempts to introduce TA in the German political arena have a long and somewhat tentative history. Inspired by the example of the US Office for Technology Assessment, members of the German Bundestag have been trying to establish a similar organisation since 1973 (Dierkes 1986). But until now no firm institutionalisation has been agreed on. There were some temporary sub-committees, called "Enquete-Kommissionen", for certain technical subjects - atomic energy, information & communication technology, and genetic engineering. In 1990 the Committee on Research and Technology Policy installed a small TA unit with provisional approval for three years. Outside parliament there are other forms for mediating in the debate on technology policy, for example ethic committees or public hearings, which can in a wider sense also be seen as TA bodies.

It seems that there are some more public and formal TA procedures in Germany than in Great Britain. The reason might be that the political system in Great Britain is more closed; small parties as the Greens have no chance to be elected to the parliaments and councils (Brendle 1992, p.8-9). Thus the environmental pressure groups can address their aims only in more informal policy communities. In Germany government administrations and informal policy communities had been traditionally very restrictive against the participation of new social and environmental pressure groups. So the new groups had to address their aims more by public protest which the state sometimes tried to repress by violence. But since the late seventies the Greens were elected to most parliaments and councils (in Germany we have a system of proportional representation with an entry threshold of five percent). Thus the new pressure groups gained formal power and have been slowly becoming accepted as communication partners. Even the very traditional governmental administrations are now being forced, to some extent, to open their consultation bodies.

Most TA activities in Germany, however, take place in the scientific arena or are directly addressed to the political decision makers - without public and formal debate. According to a new survey (Berg 1992, p.3-6) there are in Germany some 136 scientific institutes where at least 400 scientists are actually doing or planning research

related to TA. Most of their projects concentrate on energy technologies (40%) or information & communication technologies (30%). Although biotechnology and genetic engineering have been a hot topic in the public arena over the last few years in Germany, in the academic arena this subject is under-represented; only 4 percent of the TA projects listed in the survey are devoted to this theme. While most of the genetic engineering products have not yet reached the marketplace, the scientific interest in TA seems to be more directed to pragmatic and empirical policy needs of the more established technologies than to the more theoretical, moral and hypothetical questions raised in the public debate on biotechnology.

### **First steps to channel the emerging debate**

When in 1984 the first TA procedure on biotechnology, the Enquete-Kommission on "opportunities and risks of gene technology", was started by the German Bundestag, W.M. Catenhusen, a member of the Social Democrats and later chairman of this committee, expressed explicitly, that by this means, a political conflict, similar to the one surrounding the the atomic energy controversy, should be prevented. Before the explosion in Chernobyl German society was already strongly divided into those for and against this technology and the tone expressed by the slogan "Atomic energy, no thanks!" had just begun spilling over to the biotechnology debate (Radkau 1988). The Green party which had just been elected to the German Bundestag for the first time (in 1983) tried to forge a minority coalition with left wing members of the Social Democrats to initiate an Enquete-Kommission (Gill 1991a, 167 pp.). They wanted to appoint the Kommission to elaborate a catalogue of proposals to prevent most DNA-technology experiments. But Catenhusen, a more technocratic-minded politician, organised a majority of Social Democrats, Christian Democrats and Liberals (the latter two forming the governing coalition) into addressing the topic in another way. He proposed that the technology should not be addressed in terms of black and white, or "yes or no", but that it should be discussed in several (foreseeable) fields of application according to its social and environmental consequences. In other words: The technology as such got the approval right before the assessment began. When the technology as such later was challenged within the Kommission, some members always referred back to the formal mission of the Enquete once settled by the Bundestag. They pointed that by this mission only some applications might be regulated or restricted.

### **Should technology be the starting point?**

Long before parliament began to discuss the subject, the research administration had been promoting biotechnology as a "key technology" for industrial competitiveness (Gill 1991a, 119 pp.). In this way they had put a technology, first a means to satisfy social needs (health, nutrition, communication etc.), in the position of an end of a political strategy as they had already done before with nuclear energy and electronics. And the critics from the growing environmental movement in Germany simultaneously accepted they would have to oppose technologies, like nuclear technology, rather than to struggle for alternative politics, even if the more sophisticated critics saw technology as a symbol of the centralised power structures which were preventing alternative developments and not as the demon per se. Thus technology itself - and not social problems or peoples needs which might be solved by one or another technology or even

non-technical procedures - had become a central topic of politisation. As R.Ueberhorst, former chairman of the Enquete-Kommission on atomic energy, put it in his critique of the work of the Enquete-Kommission on DNA-technology:

"The debate on 'benefits and risks' of automotive engineering, of nuclear energy technology or of pharmaceutical products is just a narrowed starting position, because within such a framework alternative future concepts for mobility, energy use or health could no longer be discussed. Under a perspective which is orientated towards single technologies, it would no longer be possible to recognize the politically more ambitious assessment tasks. This is because the more ambitious valuation tasks relate not only to the simple alternative 'do it or leave it' but to more complex alternatives of different socio-technical options." (Ueberhorst 1990, p. 220)

But Ueberhorst, also a member of the Social Democrats, was in the privileged position to write this critique. Rather than focus on nuclear technology alone, the Enquete-Kommission he once chaired, had compared four scenarios on future energy needs and the technical means of fulfilling these needs. Because the debate on nuclear technology at this point of its history was identified with energy production, i.e. as single use-technology, - and was no longer be discussed as a multi use-technology (Radkau 1988, p.351) - the Kommission could take the end, i.e. energy production, as the starting point of the assessment. When the Kommission of Catenhusen however decided to conceive DNA-technology as an instrument with the promise of multiple uses this strategy could not have been fulfilled already for practical reasons.

But even in another case with a more restricted issue, that is the TA project on genetically induced herbicide tolerance, which is at present being organised by the Wissenschaftszentrum Berlin and financed by the Federal Ministry of Research and Technology as an social experiment of environmental conflict management, the chairpersons and the members of the chemical corporations rejected our suggestion to assess the problems of weed control and the existing and promised agricultural instruments and procedures to resolve them rather than concentrating on the total herbicide strategy which does not yet work at all (Gill 1991b).

From its origin and its name it might be expected that TA would focus on a certain technology. But when environmental and social pressure groups are invited to participate, they are invariably placed on the defensive just by the mere definition and setting of the usual TA procedures. They have to criticize a technology which promises to satisfy some needs which may even be produced by the technology itself or at least are defined by the groups who will reproduce their prestige, power or capital interests by the proposed innovation.

### **The costs of ramification**

The technical fixation just proposed by the mere definition and setting of TA is normally followed by the ramification into technical details within its procedures. The Enquete-Kommission on DNA-technology for example, divided its subject into so many fields that in the end, after almost three years of work, they produced an report, as thick as an telephone directory (Catenhusen 1987). So thick in fact, that no member of parliament was able to read it entirely. But the Kommission found no political "key instrument" that would fit in the dynamic regulation of a fast developing "key technology". Instead the Kommission addressed over 150 recommendations to the

Bundestag; these have taken over several years to process through its standing committees. Thus many of the recommendations had become obsolete before they could have been translated into concrete political action.

The formulation of the DNA-technology Act [Gene Act?] to control the environmental and health risks of genetically manipulated organisms (GMO) bypassed the Bundestag. The dominant actors to initiate this law were being the Bundesrat (representation of the county governments), the courts, environmental pressure groups and industry. Without any influence on the formulation, the Bundestag was at last urged (by the coalition parties which acted then as servants of the government) to approve this legislation in 1990, which has been so far the most central event in the biotechnology debate. By its bureaucratic means the DNA-technology Act [Gene Act?] has also broad influence on the speed and areas of biotechnology diffusion.

But it was not for the mental convenience of technical fixation alone that the Kommission had fallen into the trap of time consuming ramification. A majority of the Kommission tried to avoid political conflict, when they restricted their work at the beginning to mere factual questions. Conflicting options put forward by the proponents and opponents critics in the Kommission were not selected but transformed into "investigation demands" and added without discussion to a thus fast growing research agenda. In the end there was not enough time left to edit the report along more sophisticated guidelines, hence the rather trivial statement of "opportunities and risks". Each proponent and opponent could select some arguments favoring their position. Non-decision was the price for the protection of harmony and hence consentially - apart from the Green delegate - approved recommendations. The majority believed that consent would be a guarantee of political influence - an illusion, as we have seen above. But there is more political bias produced by this supposedly neutral method. Following the ramification into the very detail of the technology, the Kommission had to address its questions to the very scientists who had developed it. The higher the degree of ramification the more unlikely it became to find some of the few internal critics.

A similar structural effect is being produced by the amount of technical information within the TA on herbicide tolerance: only the members from the chemical industry can circulate the bulk of papers through the large research departments of their companies to get technical comments while the environmental groups with far less resources just have to cope. Thus TA is reinforcing rather than challenging the traditional power structures which determine technological decisions.

### **The non-explicated value basis**

The technical fixation coincides with the dodging of any value debate. When the Enquete-Kommission on DNA-technology faced that it also had to address the question of ethics, an absurd discussion was started: how to formulate a moral position without deciding for or against particular values?

But even if it rests undecided or even unexplained, each technology assessment is value-loaded. This was even accepted by W.Daele, who, as a social scientist, had been member of the Enquete-Kommission on DNA-technology. In his analysis of its work, he had to admit that the Kommission implicitly directed itself towards established values (Daele 1987, p. 42). Nevertheless he settled on "factual rationality", i.e. the rationality of means, as the exclusive discourse basis of the TA on herbicide tolerance

which he now is organising; he rejected any discussion on the (ir)rationality of established "values", e.g. the growth of the chemical industry.

Thus by TA automatically these parts of the German Grundgesetz (our constitutional law) are reinforced which refer to freedom of science, profession and industry. They can only be overruled if it is empirically shown that there is any concrete hazard for the life or physical integrity of people. Because future events cannot be empirically proved by definition, at the very best arguments that are based on short extrapolation or on close analogies will be accepted. In this way, all prognoses on the more distant future and of events with up to now unexpected synergism are excluded. Because of the above mentioned liberty rights however, even hypothetical promises of benefits do not have to be proved in the same strict way.

This usually non-explicated value basis of TA may fit to some extent for debates which focus on the direct risks for physical integrity of human beings. But the German Grundgesetz and the constitution of all other industrialised countries had been settled before DNA-technology was put on the agenda. That dangers for human beings and natural resources should be avoided is now widely accepted in German society. But there is no general consent as to whether we want to have human beings or animals or plants "ameliorated" by genetic manipulation, and if so, to what or whose purposes. In this situation, the premises of values and facts are anything but clear. These principal questions have to be discussed in a more public arena rather than in a technically centered TA procedure.

The workshop on biosafety however, organised by the newly established TA unit of the Bundestag, showed an interesting development. The organisers invited expert statements from both sides, the proponents and the critics. Rather than forge consent their strategy aimed to clarify the points of dissent. All sides were surprised when the expert report from the proponents, signed by H.G.Gassen, converged in some details with the opinion of the critics. The laboratory of Gassen had done some research within the funding programme on biosafety aspects initiated in 1988 by the Federal Ministry of Research and Technology and could not ignore some problematic findings. Gassen defended his colleagues and their results rather courageously when they were attacked by angry spokesman from the chemical industry. Thus by the role binding as expert witness on biosafety, Gassen had to cease some pretensions strongly held by his "camp". But this interference between the frontiers could only happen because the value framework of the biosafety-topic is rather clear. On this topic even the Enquete-Kommission could be drawn in a real learning process (Hohlfeld 1990).

### **Mobilising or pacifying the public?**

However, the fact is often ignored that all concessions or all critical results can be neutralized. Technology Assessment will usually be addressed to the government or to other bodies with decisional power. If the outcome of the consultation process fosters the primary intentions of the decision-makers, it will be used as resource for legitimation. If not, it will mostly be ignored (Mayntz 1986). Experience shows that even the integration of decision-makers does not guarantee that they will later defend the propositions to which they agreed in the consultation process.

In the Enquete-Kommission on DNA-technology, the representatives of the governing parties, of science, and of industry, accepted the request for a five year moratorium for

the deliberate release of genetic manipulated microorganisms. Against this position strong objections were made by science and industry when the report was published. In the ensuing debate in the Bundestag, the Christian Democrats rejected the moratorium proposal they had agreed with some months before in the Kommission (Gill 1991a, p.189-190). One may ask why they acted so inconsistently. This tactic bound the opposition to keep diplomatic silence for three years during the bargaining procedure while public criticism would have hampered governmental decisions (mostly: non-decisions).

TA bodies may here take initiatives to promote their influence by stimulating public debate. However publication of processed data or results may be restricted by the authorities which have appointed the consultatory body or by the members within the body itself who have an interest in silencing the public. But even without censorship, consulting information which was designed to address the decision makers' technocratic needs may be too esoteric to gain public attention. This, I suppose, will be the outcome of the present German TA process on herbicide tolerance. Or the consulting information will restrict public awareness to technical questions and thus head off the perception of social and political problems as happened with the public reception of the report by the German Enquete-Kommission on DNA-Technology.

A similar effect can be observed in the case by case assessment of deliberate release of GMO's where the German DNA-technology Act prescribes public hearings. Here German science and industry seems to have consented to the strategy to achieve the first approvals with less controversial experiments. The first application was sought for genetically manipulated petunias, which were neither very dangerous nor very interesting and had been planted out by a public research institute, the Max-Planck-Institut in Köln. Experiments with a higher potential for environmental damage or designed by private industry will be applied for in due course, as public awareness is expected decreasing time by time.

The weakening of public awareness had already been experienced by genetic science and industry when the hazards of genetic engineering were discussed in the United States in the seventies. Assessment then concentrated on some weak microorganisms, special strains of the bacteria E.coli, which were used in most experiments in this time (Krimsky 1982). It was agreed that these microorganisms are not so dangerous. But from then on, further organisms were used and other methods for manipulation were introduced which had never been rigorously analyzed because public concern had been allayed by the first assessment.

Hence we have to recognize that TA is seen by many protagonists as an instrument not to influence the selection and the design of technologies but to manipulate the public. As H. Neumeister clearly put it when she explained the aims of the Christian Democrats in appointing the Enquete-Commission on DNA-technology:

"The most difficult problems in the context of new technologies arise from the fear of the unknown and incomprehensible and also from the lack of confidence in all those who bear responsibility for these things ... Politicians have to be capable not only of assessing scientific laws and possibilities on the basis of their knowledge; for a good policy they must also have the capacity to substitute this lack of insight on the citizen's part by inspiring confidence." (Dt.Bundestag 1984, p.5771)

### **How to avoid the participation-trap?**

With the growing public success of their arguments social and environmental pressure groups, or in exclusive parliamentary arenas - members of the Greens, are being invited more and more to participate on TA procedures, mostly however in an minority or marginal position. In 1991 as a consequence of the DNA-Technology Act even to the Federal DNA-Biosafety Committee, which was up to this time the firmest bastion of genetic science and industry, one delegate of an environmental group has been appointed. This can be seen as a political success but there is also growing concern within the groups that they risk being absorbed by the above-mentioned ramifications of these procedures, might lose credibility and could become alienated from their grass-roots. German pressure groups are particularly suspicious, compared to other European groups, because of their different history and experience of success (Brendle 1992).

Losing credibility might occur when members of the pressure groups have to compromise in more or less secret bargaining-processes. Inconsistent action, as we have seen above, is not a great problem for the traditional groups. Politicians and spokesmen from industry can make concessions today and state the contrary tomorrow without a second thought. Although people is used to think that they lie anyway, they have the power which is being reproduced through strong governmental and industrial institutions. But because the institutions of social and environmental pressure groups are weak, their only influence derives from the fact that people believe them. For example when the "Eurobarometer" of the EC Commission asked people whom they trust "to tell the truth about biotechnology", out of nine social institutions the highest rate of 52% was given to "environmental organisations" and "consumer organisations", a medium rate of 20% was given to "public authorities", and a low percentage of 6% and 5% was given to "industry" and "political organisations" (EBIS 1991, p.18). So environmental and social pressure groups have more to lose if they compromise in bargaining situations.

They might become alienated from their grass-roots because meetings are usually held in arenas where the social attributes of traditional prestige and authority reign. Far from "home", i.e. far from their social backgrounds, the representatives from the new pressure groups will all too easily conform to these conventions which will meet the secret wishes of everyone because we are all socialised into a culture where these attributes are a means of domination. Alienation among the new pressure groups is often deepened by the traditional power groups when they publicly praise the "constructive thinking, competence and rationality" of their bargaining partners, and disparage the others as "emotional" and "irrational". Thus the always latent educational and social differences is seen to arise between the representatives and their peer groups. These alienation processes are worse if the discussion is not accessible for the public and if personal responsibility for the political consequences cannot be identified. Large pressure groups are therefore in a better position because they can balance their social differences and can control their representatives by their more complex institutional structures and not by personal conflict. In other words: they can tolerate more dissonance without losing their political identity.

By the success of their initial agitation, the new pressure groups may be even obliged, I think, to participate in very technically orientated TA procedures. At a certain point in their career, it is necessary for social movements, I think, to transform their publicity

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success into concrete political action. Otherwise the people who have faith in them, and who have voted or donated to the cause will become frustrated and may fall into passive fatalism. And the only place to transform their public support might be a certain TA procedure. But the pressure groups should try to influence and make use of TA to assure public involvement and mobilisation within its procedures: to win the one (bargaining success) without losing the other (their credibility)!



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