Participatory Technology Assessment

European Perspectives

Edited by
Simon Joss and Sergio Bellucci

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List of Case Studies

Austria

Ozone Consensus Conference	(Ozone AU)
Traffic Forum Salzburg	(Traffic Forum AU)
Austrian Technology Delphi	(Delphi AU)

Denmark

Future Search Conference on Traffic in Big Cities	(Copenhagen Traffic DK)
Scenario Workshop on Urban Ecology	(Urban Ecology DK)
Voting Conference on Drinking Water	(Drinking Water DK)

Germany

Citizens' Forum on Biotechnology	(Biotech Baden-W. GE)
Genetically Modified Plant Discourse	(Discourse GMP GE)

The Netherlands

Public Debate on Genetic Modification of Animals	(GM Animals NL)
The Sustainable Menu	(Sustainable Menu NL)
Crop Protection and Environmental Concern: Gideon Project	(Gideon NL)
Consumers' Aspects of Novel Protein Foods	(Novel Food NL)

Switzerland

PubliForum on Electricity and Society	(Electricity CH)
Dialogue on Genetic Testing	(Gene Dialogue CH)

United Kingdom

National Consensus Conference on Plant Biotechnology	(Plant Biotech UK)
Citizen Foresight on the Future of Food and Agriculture	(Citizen GMO UK)

Abbreviations used in the text

BBSRC	Biotechnology and Biological Sciences Research Council (UK)
BMD	Broad Societal Debate about Energy Policy (NL)
BSE	bovine spongiform encephalopathy ('mad cow disease')
DBT	Danish Board of Technology
DTO	Research Bureau on Sustainable Development (NL)
EU	European Union
EUROPTA	'European Participatory Technology Assessment' research project
GM	genetically modified
GMO	genetically modified organism
HR	herbicide-resistant
ICT	information and communication technology
ITA	Institute for Technology Assessment (AU)
ITAS	Institute for Technology Assessment and System Analysis (GE)
MP	Member of Parliament
NCDO	Netherlands Committee on Sustainable Development
NGO	non-governmental organisation
NOTA	Netherlands Organisation for Technology Assessment (now Rathenau Institute)
NPF	novel protein food
NSI	national system of innovation
OST	Office of Science and Technology (UK)
OTA	Office of Technology Assessment (USA)
POST	Parliamentary Office of Science and Technology (UK)
pTA	participatory technology assessment
PUS	public understanding of science
PWT	Foundation for Public Information on Science, Technology and the Humanities (NL)
R&D	research and development
SEA	strategic environmental assessments
SWOKA	Institute for Strategic Consumer Research (NL)
TA	technology assessment
TAB	Office of Technology Assessment at the German Bundestag (GE)
TEN	techno-economic network
TvC	'future visions of consumers' method
UKCEED	UK Centre for Economic and Environmental Development
WUA	City of Vienna Environment Agency (AU)

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Foreword

Participatory arrangements, such as have been analysed and assessed in various Western European countries through the 'EUROPTA' project between 1998 and 2000, reflect a growing need amongst citizens to articulate their expectations and demands vis-à-vis politics regarding new technologies. Although not usually part of the institutional law-making process, these arrangements nevertheless represent a valuable addition to the democratic process. They help to stimulate and enrich, in unique ways, the dialogue and interaction between citizens, those affected by new technologies, researchers and politicians.

The Swiss Centre for Technology Assessment first introduced participatory methods in Switzerland under the banner of 'PubliForums' in the late 1990s, and has since had much positive experience of using these methods. The Centre is, therefore, pleased to be able to support this publication, which contains the fruits of the EUROPTA research project. It is hoped that this publication will find many interested readers.

Dr Klaus Hug,
President, Swiss Centre for Technology Assessment
at the Swiss Science and Technology Council

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We also gratefully acknowledge the Centre for Technology Assessment at the Swiss Science and Technology Council for generously supporting the production of this book.

Without any interesting cases of participatory technology assessment to analyse, the EUROPTA project would not have been initiated. We would, therefore, like to thank all those who over the years pioneered participatory initiatives and in so doing contributed so imaginatively and fruitfully to the development of technology assessment. The case studies reported in this book show that behind the various participatory experiences lay the dedication and enthusiasm of a few individuals who, often against considerable odds, tried to break new ground to realise their ideas and visions.

The EUROPTA researchers received considerable support from their organisations, which is gratefully acknowledged here. We are also grateful for the excellent assistance of Patrick Burke (University of Westminster) in producing this book. During the EUROPTA project, an impressive number of external people were involved in conceptual discussions, mainly through two workshops that were held as part of EUROPTA. The project also benefited from external researchers in the form of contributions to some case studies. We would like to thank all these people for their interest and support. Last, but not least, we would like to thank all those who were willing to give up their valuable time and participate in the empirical research.

Simon Joss and Sergio Bellucci,
on behalf of the EUROPTA team

Part I

Introduction

Chapter 1

Participatory Technology Assessment in Europe: Introducing the EUROPTA Research Project

Simon Joss and Sergio Bellucci

Science and Technology in Society – a Changing Relationship

The relationship between science, technology and society has undoubtedly become one of the most salient and challenging issues in contemporary politics. This was prominently in evidence, for example, when US President Bill Clinton and British Prime Minister Tony Blair hosted a specially convened joint press conference (via satellite transmission) in June 2000 on the occasion of the initial completion of the Human Genome Project (HUGO). Hailing the efforts by public and private research teams from across the globe to decode the human genome as a historical landmark achievement, the two leaders reiterated their support for government funding of research and for accompanying measures to consider the social, ethical and legal implications of human genetics. President Clinton went on to state that genetic information derived from this and future research 'must never be used to stigmatise or discriminate against any individual or group.... Our scientific advances must always incorporate our most cherished values, and the privacy of this new information must be protected' (White House, 25 June 2000).

In the same year, the European Commission in Brussels announced its ambitious plan for the creation of a 'European Research Area' (ERA) (European Commission, 2000). One of the main motives behind the ERA plan is to boost the European science and technology base across and beyond national borders, and thus to further economic growth and international competitiveness. At the same time, Commissioner Philippe Busquin, spearheading the initiative, emphasised the importance of "putting science back in the heart of European society" (Cordis, 23 October 2000). Referring to national experiences of bringing scientists, politicians, civil society representatives and citizens together in deliberations on socio-technological issues, Commissioner Busquin called for more systematic, European-wide 'forms of dialogue' to address such issues. Asking "what sort of dialogue can we have

with citizens, and what dialogue do they expect?", he challenged the scientific and policy communities to engage in not only scientific discourse but also and equally in broader public debate (Cordis, 14 November 2000).

What is significant about these two examples is not so much the prominence in itself given to science and technology by political leaders – this is not surprising or particularly new, given their strategic importance to governments – but the particular attention paid to the social embedding of scientific-technological innovations. As such, these examples are representative of a wider trend in contemporary politics, which has seen the science–society relationship increasingly occupy a central place in policy- and decision-making processes, in the form of enquiries, debates and decisions about the normative, ethical, legal, and social repercussions of scientific–technical developments. In contrast to 20 years or so ago, when the interest in, and concerns about, the science–society relationship were still mainly the preoccupation of interest groups, grassroots movements, academics and the occasional politicians, nowadays they are articulated and addressed by policy- and decision-makers far more systematically and explicitly within both existing and new institutional frameworks.

There are several related reasons for this trend. For one thing, developments in science and technology – especially in the biosciences, but also in the physical sciences and in information and communication technologies – have brought about novel scientific-technical innovations, such as genetically modified (GM) crops, the World Wide Web, mobile phones and xenotransplantation, many of which have entered people's everyday life in often very direct ways. For another, these innovations have exposed the public to new experiences, such as the management of scientific and societal uncertainties, and the handling of new ethical and moral dilemmas inherent in some of these innovations. As a result, public perceptions of these innovations have tended to be ambivalent and thus volatile, influenced to no small degree by related contestations amongst experts as well as between scientists, interest groups and policy-makers. Consequently, these innovations have often ended up the subject of public controversies, as was starkly exemplified by the vigorous and sustained controversy surrounding GM foods across much of Europe and beyond in the second half of the 1990s, and more recently by the debate about human cloning and embryonic stem cell research (see, for example, Grove-White *et al.*, 2000; Gaskell and Bauer, 2001). In turn, this has prompted the political system – parliamentary committees, government ministries, regulatory agencies etc. – to react by addressing more directly and openly the issues raised in these public controversies.

The extent to which the social significance of science and technology has entered the political conscience may be most visibly manifest in the form of high-profile statements, such as the ones made by Messrs Clinton, Blair and Busquin, but it is perhaps more profoundly – if less prominently – manifest in the institutional and structural changes that have occurred in the last decade or so. These range from the establishment of ethics bodies that make use of 'lay people', to interactive initiatives aimed at stimulating public debate, and

from publicly funded research programmes into the social dimensions of science, to public consultation processes on the application of new technologies. Overall, these changes have arguably resulted in a more nuanced and sophisticated understanding and treatment of scientific-technical developments and their societal dimensions on the part of the body politics.

Technology Assessment as Institutional Response

One area where these changes have been particularly marked and that has influenced the wider realm of politics is that of technology assessment (TA). First elevated from a mostly academic endeavour to a political institution in the early 1970s in the USA, TA was widely established in Europe – and to a more limited extent further afield – throughout the 1980s and 1990s typically in the form of parliamentary or governmental offices (though several TA organisations were also based within academic institutions) (for a historical overview, see *Technological Forecasting and Social Change*, 1997).

In many cases, the institutionalisation of TA was itself a turning point insofar as the political system was prompted into taking notice of the significance of socio-technological developments and addressing the handling of these developments at political level. Once these TA offices were established, a process of trying and learning was set in motion concerning the means and methods of implementing the key objectives of TA – that is, assessing scientific-technological issues and giving policy advice.

It is in this context that – in Europe at least – the relevance of the societal dimensions of science and technology was increasingly acknowledged and given greater consideration than had previously been the case (for a comprehensive overview of European TA development, see Vig and Paschen, 2000). This led to significant changes in the way issues are framed, methods designed and participants selected in TA processes. Whilst it is arguable whether these changes amounted to a 'paradigm shift' in technology assessment and, more generally, science policy, as some commentators have claimed, they certainly represented a shift in the political handling of the science–society relationship. This is most clearly evident in the development of what has become known as 'participatory technology assessment'.

Participatory Technology Assessment

Broadly, the term 'participatory technology assessment' (pTA) refers to the class of methods and procedures of assessing socio-technological issues that actively involve various kinds of social actors as assessors and discussants. This may include different kinds of civil society organisations (patients' organisations, consumerists, environmental interest groups, churches, industry associations etc.), representatives of the State system (parliamentarians, regulatory agencies, civil servants, government ministries etc.), but character-

istically also individual stakeholders and citizens and, not least, scientists and technical experts. The composition of these various actors can vary from type to type of assessment – some include stakeholder representatives, others citizens' panels, yet others a mixture of the two – as does the process of interaction – some last just a couple of days and consist of only one kind of involvement; others last several weeks or months with a succession of different kinds of interaction. (For an overview of different methods and procedures, see *Science and Public Policy*, 1999.)

Generally, the aim of such pTA is to consider and evaluate scientific-technical issues beyond their purely scientific, technical and economic aspects – as is done in 'classical' TA – to include wider social, ethical and political aspects. Thus, the purpose of actor participation is to utilise the various contextual perspectives and experience of those involved for the assessment process. An additional aim of pTA can be to open the assessment up to the public sphere, in order both to make the assessment process more transparent and to encourage wider public debate and social learning.

At first, in the late 1980s, pTA was used experimentally in but a few countries, most notably Denmark, where the newly created Danish Board of Technology held a couple of so-called 'consensus conferences', which involved citizens at the centre of the assessment process (for an introduction to consensus conferences, see Joss and Durant, 1995). In the Netherlands, so-called 'constructive TA' was developed by academics in conjunction with industry, with a view to rendering the process of technology development more directly responsive to the needs of potential users through interactive assessment procedures (see, for example, Schot and Rip, 1996).

Since the early 1990s, pTA has become more widely established. Following the Danish example, consensus conferences were for the first time used in the Netherlands in 1993 (where they were called *publiek debat* – public debate) and in the United Kingdom in 1994. These attracted considerable international interest from institutions and individuals, as a result of which the number of consensus conferences has steadily increased, with conferences held as far afield as Brazil, New Zealand, Japan, the USA, Canada and South Korea (for an overview of citizens' conferences, see Loka Institute).

At the same time, new forms of pTA were developed – such as citizens' juries, scenario workshops, voting conferences and stakeholder panels – through the adaptation of existing methods used in other areas of policy-making and planning (mainly environmental planning and community development), or through the amalgamation of participatory elements from two or more methods (on citizens' juries, see Stewart *et al.*, 1994; on scenario workshops, see Andersen and Jæger, 1999; the above-mentioned methods are also described in the case studies included in this volume; see Part III).

In parallel to these practical developments, there has been a growing academic interest in pTA. Given the still relatively young experience of pTA, scholars initially mainly sought to describe and characterise the participatory methods and procedures and their organisational settings (see, for example, Grundahl, 1995; Stewart *et al.*, 1994; Bilderbeek and Andersen, 1995). This

was followed by several evaluation studies of individual initiatives, focusing on such things as participants' experiences during the assessment processes, the treatment of the issues at stake, the uptake of the processes and outcomes by the media, policy-makers and other external actors, as well as planning and organisational issues (see, for example, Mayer, 1997; Mayer *et al.*, 1995; Glasmeier, 1995). More theoretically minded scholars began to write about the role of pTA from the perspectives of democratic governance and citizenship, public controversy, and science and technology policy theory (see, for example, Cronberg, 1995; Sclove, 1995; Fischer, 1999; Hennen, 1999). What was still largely missing was, on the one hand, a more systematic survey of (European) experiences of pTA schemes and, on the other, a more comprehensive analysis of their structural and procedural characteristics as well as their functional role within their wider socio-political contexts.

The EUROPTA Research Project

For this purpose, a multinational research project was carried out between 1998 and 2000, the results of which are presented in this volume. The project EUROPTA: Participatory Methods in Technology Assessment and Technology Decision-making received partial funding from the European Commission under its Fourth Framework Programme (TSER programme) and included the following six institutions: the Danish Board of Technology (Copenhagen), which also acted as coordinator; the Centre for the Study of Democracy at the University of Westminster (London); the Institute of Technology Assessment of the Austrian Academy of Sciences (Austria); the Institute of Technology Assessment and Systems Analysis (Karlsruhe/ Bonn); the Rathenau Institute (The Hague); and the Centre for Technology Assessment at the Swiss Science and Technology Council (Berne).

The overall objective of EUROPTA was to advance the understanding of the role of participation in technology assessment, and to consider criteria for the implementation of participatory methods at relevant policy-making and institutional levels. This was to be achieved in the following three consecutive steps:

1 the development of a research framework;
2 an analysis of individual pTA schemes in the six national contexts involved;
3 a comparison of the analysed schemes and their institutional and wider socio-political contexts.

The following section gives a brief outline of these three parts of the EUROPTA research.

First, however, some qualifying remarks need to be made concerning the scope of the EUROPTA project. For the purpose of this study, the term 'pTA' is used to refer to processes of analysis, deliberation and consultation, which

are characterised by certain pre-defined organisational structures, methodological procedures and at least some element of institutional anchoring. Between different pTA schemes, these structures, procedures and institutional settings may vary, but they nevertheless lend these schemes commonality as formal assessment tools with defined objectives, inputs and outcomes. Hence, the use of the term 'pTA' in this study does not extend to the many informal processes of assessing socio-technological issues that occur as part of wider public debate and often evolve 'bottom-up', with no clearly identifiable kernel of organisation and structure.

One can argue, of course, that these informal, 'bottom-up' processes – as can be observed, for example, when people in a local community get together to scrutinise the siting of a field-trial for GM crops, or when the human health risk and privacy aspects of mobile phone use are discussed in public forums and in the media – constitute as much forms of pTA as do 'top-down', institutionalised processes, such as citizens' juries and scenario workshops. In fact, the more narrow definition could be criticised on the grounds that it accepts too unquestioningly the main normative and conceptual premise underlying the institutionalisation of TA, namely that TA ultimately serves as a tool for officialdom (the State) to help to promote and 'push' technological innovation, thus preventing the necessary critical distance and reflection expected from an academic study; and it could be criticised on the grounds that it does not sufficiently take account of the nature and dynamics of public discourse and controversies about socio-technological issues – important conditioning factors of TA – thus preventing the development of a more fine-grained picture of the functional role of pTA within wider socio-political contexts.

If, however, the term 'pTA' is nevertheless used in the more narrow sense in this volume, as outlined above, then this is for the following two reasons: first, the term has in the last two decades become closely associated with the emergence of formalised participatory procedures as developed, and used, by established TA organisations. The *raison d'être* of the EUROPTA study, then, was to map and analyse these procedures and their institutional settings, and thus to contribute to the understanding of their role in science and technology policy-making and public debate. Secondly, extending the term to include all sorts of informal processes could come at the cost of loosing the necessary analytical focus, which is particularly relevant in a multinational study: comparing as diverse processes as, say, a citizens' protest, a media debate and a scenario workshop across national borders and calling them all 'pTA' would make it difficult to identify the main features, special characteristics and the functional role of what is called 'pTA'. The term, therefore, would risk becoming vacuous.

Importantly, however, delimiting the term to refer to pTA processes that are characterised by certain pre-defined structures, procedures and institutional anchoring does not mean that other (formal and informal) processes of assessing socio-technological issues are regarded as less relevant, and are not taken into account in the analysis. On the contrary, the very point of the EUROPTA study is to analyse these pTA schemes within their institutional

and wider socio-political contexts, and thus to analyse the interrelationships between pTA and the wider policy- and decision-making processes, as well as public debate, on science and technology. The foundation for this is laid in Part II of the book.

Research Framework (Part II)

An overall characteristic of pTA in Europe is its variety and richness. PTA comes in different forms and shapes. It is used by different kinds of institutions and organisations, for various conceptual, normative and practical purposes. Its outcomes vary according to the remit given and context in which it is placed. The practical experience, and the perceived usefulness, of pTA differ accordingly.

A comparative study of European pTA experience, therefore, should be broad in the sense that it should allow to capture and analyse this variety and richness. It should not have too narrow a normative and conceptual basis, as this could prevent an accurate characterisation of the actual pTA experience. At the same time, such a study needs to be designed in a sufficiently systematic way, so as to allow proper cross-national, cross-institutional and cross-thematic comparisons.

This is reflected in the design of the analytical framework (Chapter 3), which was derived from a concept developed to analyse the role of participatory arrangements in relation to their institutional and wider societal settings (Dachler and Wilpert, 1975, adapted for TA by Joss, 1998a). Thus, the framework does not exclusively focus on pTA arrangements, but equally on the institutional settings in which the arrangements are placed, as well as on the societal context within which they take place. The actual role of pTA, then, is understood as the result of an interplay between these three dimensions (arrangement, institutional setting, social context). The characterisation of the multiple interrelationships between these dimensions is key to analysing pTA in this framework. Each dimension has several elements, or factors, that describe the dimension.

In order to operationalise the analytical framework, a common research protocol was designed (Chapter 4). For each dimension, and each element, a set of questions was defined, and explanatory notes added, with a view to guiding the case studies. All researchers involved in the EUROPTA project used this protocol to carry out the empirical research.

The analytical framework was complemented with a theoretical perspective (Chapter 2) on the emergence of pTA. Based on the historical development of institutionalised TA, the theoretical perspective discusses the concepts and normative justifications frequently used in the literature as well as amongst practitioners to explain the aims and objectives of participation in TA.

Case Studies (Part III)

Central to the EUROPTA project was the evaluation of pTA arrangements in the six national contexts chosen (Austria, Denmark, Germany, the Netherlands, Switzerland, United Kingdom). In each country, between two and four participatory arrangements were selected for analysis, 16 altogether. The arrangements were chosen in a way as to be broadly representative of the development, and status quo, of pTA in those countries. An attempt was made to achieve a good balance between: the type of participatory arrangement (citizen versus stakeholder involvement); the type of institutional setting (established versus ad hoc organisational settings); and the range of topics dealt with in the arrangements. As the Danish model of consensus conference has over the years been adopted by several organisations in various European countries, it was decided to include these in the analysis. This allows for direct comparison, especially as far as the relationship between the consensus conference arrangements and their respective institutional and wider social environments are concerned.

The empirical research, which was largely based on interviews and documentary analysis, resulted in comprehensive information and analysis of the 16 arrangements chosen, providing a good overview of pTA experience in Europe. The case study material also proved invaluable for the subsequent comparative analyses (see further below). At the same time, however, the case studies also have some limitations: they had to be carried out under considerable financial and time constraints, thus limiting the number of interviews done. Furthermore, the research protocol was with hindsight found to be 'thin' in respect of some aspects, such as the characterisation of outcomes and impacts of participatory arrangements. Finally, some cases were written by those who had actually implemented the participatory arrangement studied – the research partnership included national TA organisations – which may perhaps have impeded the analytical distance needed for an evaluation of this kind.

As each of the 16 case studies turned out to be quite voluminous, they were summarised in country chapters for the purpose of this book (see Part III, Chapters 5–10). The full case studies are available from the organisations involved in the EUROPTA project. Alternatively, they can be obtained from the EUROPTA coordinator (Danish Board of Technology).

Comparative Analysis (Part IV)

Apart from analysing individual participatory arrangements, a key aim of the EUROPTA project was to carry out a comparison of the case studies, so as to obtain an integrated picture of pTA in Europe. The purpose of the comparison was to identify and characterise factors both within participatory arrangements and in their institutional and socio-political settings that co-determine the role of pTA.

The 16 case studies were compared by the EUROPTA team through an iterative process, resulting in observations and findings, which were grouped into five thematic fields. For each field, an in-depth comparative analysis was carried out, which was later presented at an international workshop in The Hague in October 1999. The feedback from the workshop helped to refine the analyses, which are presented as five separate chapters in Part IV of this volume.

The first analysis (Chapter 11) discusses the significance of the introduction of pTA in the European context, both in respect of the working of individual methods/arrangements, and in respect of wider institutional and socio-political developments in the field of science and technology policy. The second analysis (Chapter 12) evaluates the case studies from the viewpoint of management, by asking which factors are more or less conducive to effective and efficient management of participatory arrangements. Chapter 13 looks at the relationship between the issue, which is the subject of assessment in a participatory arrangement, the methodological rationale underlying the chosen arrangement, and the institutional context within which the arrangement takes place. Chapter 14 discusses the political role of pTA in various socio-political contexts. Finally, the last analysis (Chapter 15) looks at the effects, or impacts, of participatory arrangements on policy analysis, policy- and decision-making, as well as public debate in the field of science and technology. The conclusions of the extensive analyses, which the EUROPTA team reached at a special workshop, are summarised in the final chapter (16) of the book.

Part II

Research Framework

Chapter 2

Theoretical Perspectives

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Constructing a Research Framework

A cross-institutional and cross-national analysis of diverse (European) participatory technology assessment (pTA) experiences requires a common conceptual and methodological basis of some sort if the analysis is to be properly systematic and comparative. However, this is easier said than done, as pTA presents itself in many shapes and forms and is performed in diverse institutional and socio-political settings, thus making it difficult to analyse it using a common concept or methodology without losing sight of the richness and diversity of pTA practice. Moreover, the conceptual understanding of pTA is often normatively conditioned, leading to different perspectives on, for example, the role of pTA in the processes of public policy- and decision-making. Not surprisingly, then, whilst over the years several useful conceptual and methodological contributions have been made looking at one or the other aspect of pTA, no overall broad conceptual framework has been available to use in comparative research.

Therefore, in the absence of such a framework, the first task facing the EUROPTA research team was to define what in the course of the project came to be called the 'research framework'. The aim of the research framework is twofold: to advance the theoretical conceptualisation of pTA; and to prepare the groundwork for the empirical analysis undertaken (in the form of the case studies, see Part III). The framework consists of three parts: theoretical perspectives (this chapter); an analytical framework (Chapter 3); and a research protocol, which was used to carry out the case studies (Chapter 4).

The theoretical perspectives sketch major developments in modern societies that may be said to form the political and social background for the establishment of TA in general, and participatory processes in particular. The

chapter puts pTA in a historical perspective, and discusses it under the aspects of normative, cognitive, and practical uncertainty, as well as inequality relating to scientific-technological developments and policy-making.

The analytical framework is a pluralistic model of interdependencies between a pTA arrangement, its institutional embedding and the societal surroundings. It is made up of three structural levels, namely 'societal context', 'institutional setting' and 'participatory arrangement', and, importantly, their multiple interdependence. It should be noted that the focus of the analytical framework (as of the EUROPTA project as a whole) is on the participatory arrangement.

The three-layered conceptualisation of pTA and its contexts are reflected in the research protocol, which consists of a series of questions aimed at enabling an analysis of the functional role of a participatory arrangement within a given institutional and socio-political setting.

The research framework presented here should be understood as a step towards a more comprehensive and pluralistic conceptualisation of pTA than previously available, and not as a complete theory or concept. As such, it could be used by other researchers and policy analysts to further elaborate certain aspects, and to add other relevant theoretical and conceptual perspectives, as deemed necessary. The framework, thus, reflects the understanding of the EUROPTA team that there is no such thing as the one 'right' and 'ultimate' way of conceptualising and practising pTA. PTA processes may vary according to the various socio-political contexts in which they are placed, and the diverse aims and purposes that are pursued with pTA.

Theoretical Perspectives

The following aims to bring together various perspectives on the emergence of TA and the development and practice of pTA that have been discussed in the scholarly literature and amongst TA practitioners, and thus to advance a more integral understanding of the function of pTA. In particular, the chapter aims to:

- identify the different values and normative claims at work in pTA;
- understand the different theoretical arguments used;
- understand the variety of practice (structures, processes, outcomes);
- clarify the (subject-specific, institutional and cultural) contexts of application;
- identify factors conducive to pTA;
- discuss the function of pTA in modern societies.

The following does not aim to provide guidance in how to determine what a 'good' technology might be in a societal context; rather, it aims to describe the conditions in which pTA is utilised and operates. Furthermore, it is based on an overall understanding of the issue of participation, which is defined in terms

of neither a particular single theory, nor a particular set of normative claims, nor a particular mode of practice, but in terms of a complex, multi-faceted social issue. Participation is recognised as having various defining dimensions and contextual settings that characterise and condition it in different ways.

Theoretical Background

The issues of both participation and TA are conceptually and practically so far-reaching that it proves rather difficult to consider them on the basis of just one kind of theory. In fact, looking at the rich literature on TA and pTA (see references), it is clear that a range of different schools of thought – including systems analysis, policy science, democratic theory, sociology of scientific knowledge, communication theory – can claim to have substantially contributed to the development in this field, even if they at times have arrived at contradictory claims. Therefore, a theoretical framework should consider, as far as possible, various schools of thought concurrently.

Essentially, there are two main argumentation lines: under the premise of a plurality of views, pragmatic arguments consider the function of pTA as improving and facilitating decision-making, whereas normative arguments stress the intended function of rendering decision-making democratic. These lines of thought are linked to two perspectives: uncertainty and inequality. The two perspectives are closely intertwined.

The issue of uncertainty is widely seen as a key characteristic of modern science and technology, and the underlying cause for the emergence of 'movements' and instruments, such as TA. Thus, the theme of uncertainty is an essential element forming the boundaries, within which TA and pTA act.

Then there is the issue of inequality. Resources and opportunities to influence the decision-making process are not the same for everyone. Additionally, those who take decisions may not be those who end up being (negatively) affected by technological developments. For example, risks and benefits from a new technology may be unevenly distributed. The issue of inequality has been at the centre of social science discourse and political debate for a long time, and it also plays an important part in the discussion of (public) participation.

Therefore, the theoretical background of the discussion of pTA in the EUROPTA project centres on the question of how to deal with uncertainty and inequality in science and technology public policy.

The State's Dual Role, and the Problem of Expertise

As a part of the system of innovation as well as the public sphere, the political system's engagement in technology policy is twofold and it is confronted with contradictory demands: on the one hand, the State acts as promoter of science and technology, in order to exploit the benefits of new technologies. Actors within the innovation system expect support from the State in the implementation of new technologies. The political system is also expected to help to create

a positive public climate of technology acceptance. On the other hand, the State is responsible for the regulation of the application of technologies to avoid unintended negative consequences for the public (citizens, consumers, employees). Citizens expect (possible) risks stemming from technology to be under control and regulated to safeguard their interests. As they see themselves affected by technologies, over which they cannot rule, they often expect influence on decision-making processes within the political sphere.

In order to reconcile these different tasks, the State depends, amongst others, on external expertise. But that which science is supposed to provide for politicians, namely factual knowledge as a basis for decision-making in situations of uncertainty, is precisely what science can often not provide. The question 'How safe is safe enough?' in the case of risky technologies (for example, gene technology, mobile phones) can often not be answered factually by science.

The political system is frequently found to lack the management facilities and the opportunities to reconcile diverging interests as a basis for decisions on technology policy that are acceptable to all or at least a majority of actors. This is due to: the contestation of factual expertise (problem of knowledge; cognitive dimension); a lack of societal consensus concerning modern technologies (problem of legitimisation; normative dimension); and limited capacities of the political system to steer technological developments (problem of management; pragmatic dimension).

Inequality

Analytically, three dimensions of inequality can be distinguished:

1 A cognitive dimension, which reflects different actors' perspectives on scientific and technological issues, including the technologies' influence on their living conditions.
2 A normative dimension, reflecting the plurality of (possibly conflicting) norms and values that often get mixed up with interests – even more so, as generally binding norms in society have been challenged or abolished.
3 A pragmatic dimension, reflecting the unequal distribution of institutionalised or informal influence on decision-making processes shaping technology, as well as the unequal distribution of resources that enable actors to take part in such processes.

Uncertainty

A cognitive, normative and pragmatic dimension is also suitable to distinguish important aspects of uncertainty. With knowledge production accelerating, *cognitive uncertainty* is generated, as the understanding of a phenomenon becomes ever more complex, and, at the same time, principal limits of cognition emerge. *Normative uncertainty* arises from new questions

and problems generated by scientific-technological developments, for which traditional ethical principles, norms and standards are not instructive or adequate any more and new ones are not (yet) in sight. *Pragmatic uncertainty* results from the difficulties of political and social systems and institutions to reach conclusions and, under conditions of cognitive and normative uncertainty, to implement decisions in a turbulent social environment. Not only the consequences of technological developments, but also the reactions of other social actors become more and more uncertain.

How to Deal with Inequality and Uncertainty – Tasks for a Policy Tool

The State's management problems when pursuing its different tasks in technology policy-making cannot be seen detached from those of the legitimisation of the policy-making processes. In the public sphere, diverging evaluative and normative claims vis-à-vis technology policy collide, jeopardising the legitimisation of policy decisions. A tool that aims to be of any help within technology policy-making has to address these two sides of the coin. In order to deal with uncertainty and inequality at the interface between state decision-making and public debate, we can identify several tasks:

- *Cognitive uncertainty.* When preparing decisions, a comprehensive cognitive basis has to be built up, taking into account findings from all relevant disciplines as well as collecting the 'tacit knowledge', especially of those who are potentially affected by technological developments.
- *Normative uncertainty.* The full spectrum of points of views should be represented. This also includes those world views that often get marginalised during technology policy-making.
- *Pragmatic uncertainty.* As complete a set of options as possible ought to be established, taking into account the interests of all actors and all persons affected. Areas of possible overlaps have to be found, in order to prepare for further consensus-building.
- *Cognitive inequality.* Knowledge of uneven distribution of benefits, risks or influence needs to be generated and taken into account. No implicit or tacit decision should be made regarding the inclusion or exclusion of, say, a particular scientific discipline and its findings/perspectives.
- *Normative inequality.* The plurality of views and values needs to be taken into account and not selected against. No particular set of norms or standards should be determined to be more significant than others from the outset.
- *Pragmatic inequality.* Procedural measures should be taken to ensure, for all participants, equal access to resources, and equal opportunities to make their voices heard.

The cognitive, normative and pragmatic dimensions demand different measures to cope with inequality and uncertainty. In order to cover such a variety of tasks, policy tools ought to fulfil different functions:

- *Cognitive dimension*. Policy tools should enhance the decision-making process by making it better informed – that is, supporting decision-making in a way that ensures decisions are taken on the basis of the best available knowledge. They should enable different disciplines and perspectives to contribute to the broadening of the scope of a problem, and to inform the relevant actors and institutions of alternative points of view and different possible solutions, as well as enable actors to gain insights from, and about, each other.
- *Normative dimension*. Policy tools should broaden the legitimisation of decision-making by providing a voice also to those affected and/or to those previously marginalised, and thus democratise the decision-making process.
- *Pragmatic dimension*. Policy tools should contribute to the basis for future consensus-building, or for the clarification of disagreement. They should do this by providing forums, where common searches for solutions to inequality or uncertainty problems can be made. They should aim at improving the conditions for such search procedures.

Contexts of Justification for pTA

TA as a hybrid scientific-political method is both a part of, and an answer to, these problems of political decision-making. In general, TA has always had a two-track mandate: to provide scientific advice on policy, with a view to solving the political management crisis (addressing decision-making); and to integrate diverging evaluative and normative claims vis-à-vis technology policy, with a view to handling the legitimacy and communication crises (addressing the public).

This dual task has been central to the conceptual debate about TA ever since its inception. The 'traditional' conceptualisation views TA essentially as a process of communication between scientists and decision-makers. It has revealed its weakness in the course of the evident disappearance of a value base for assessing scientific and technological developments, or in some instances the attempt to insist on an exclusive science/economy-derived value basis. And it revealed its weakness in the course of the growing awareness of the fundamental uncertainty attached to the forecasts of the consequences of technologies. The quest to relate to public controversies over technology has become an essential challenge for TA and has led to the integration of participatory methods in TA processes. Participation is seen as providing a cognitive, normative and pragmatic basis for socially legitimate decisions under the conditions of a dynamic process of technological development, the uncertainty of knowledge and contested values. It should open up possibilities for social learning, which is not necessarily considered to lead to new consensus among actors holding different views and interests, but at least to explore the horizon of possible alternatives and the room where future consensus and disagreement may evolve.

In conceptual debates about TA the requirement for, and justification of, participation has been argued three-fold: first, TA requires the knowledge input from those affected, in order to support political decision-making that is well informed and that takes into account the whole spectrum of a problem. Secondly, the interests and values of those affected, as well as the inequalities in everyday life for actors to make their views heard, need to be taken into account if political decision-making is to be considered legitimate and, consequently, stand a chance of gaining social acceptance. Thirdly, participation creates an arena where conflicting claims can be reconciled, and where new solutions can be developed and deliberated upon.

Cognitive Enhancement of Decision-making

With a focus on cognitive and pragmatic uncertainty, the first context of justification views participation in TA as a functional requirement, and concentrates primarily on functions of (cognitive) preparation for decision-making. In this case, TA can be seen as an intermediary between science/technology and politics, and is supposed to improve performance in decision-making.

The reference points for a functional rationale for participation are similar to those of the classic TA concept. Participation aims to contribute towards completeness and balance in analysis. Informing the public aims to give the process of public opinion-forming a more informed, factual basis. Information from the public may contribute to providing knowledge of the claims of citizens, and the involvement in the TA processes of those affected may provide room for exchange of rationales and, thus, lead to decisions that have an increased chance of acceptance by the involved actors.

Democratisation

With a focus on normative uncertainty and inequality, especially with respect to issue of power, the second context of justification views participation in TA as a requirement of democratic politics, corresponding to a view of TA processes as arenas for social (technology) policy-making. Here, TA is an intermediary between the public and politics, and is supposed to improve the democratic basis of decision-making. Under the perspective of inequality, participation aims at temporarily changing the role of someone affected to the role of a policy-maker.

The democratic political rationale for participation is based on the normative premises and political preferences of a particular TA process. The aim is to identify, from a normative point of view, legitimate needs and to implement appropriate processes of social decision-making. Participation in TA should ensure that alternatives in technology and social policy are generated. Secondly, the democratic involvement of those previously excluded from decision-making should be enhanced.

Social Learning Processes

With a focus on pragmatic uncertainty and inequality, and aiming at social integration, the third context of justification views participation in TA as an element in the discursive processing of controversial cognitive and normative claims. Here, TA is a model of social learning and an intermediary between science and the public. It is supposed to raise procedural legitimacy with respect to cognitive, normative and pragmatic aspects. It does not aim to determine policy processes directly, nor to replace political decision-making. However, it is not a-political, since the questions at stake are usually highly politicised.

TA in general aims to enhance socio-cultural capabilities to deal with social and technological changes, with an emphasis on shaping the conditions, under which technology is implemented. Discursive TA processes in particular aim at building up, or restoring, social integration as a basis for democratic decision-making rather than addressing the latter directly. This is done by procedures that create arenas where conflicting claims can be reconciled, and where arguments are generated that meet criteria of social justice, political legitimacy and scientific competence.

PTA, Democracy and Social Learning

Technological controversies may be defined as 'problems' in a public arena, along new or re-emerging lines of conflict. Such controversies put the State into a double role: on the one hand, State authorities are actors themselves; on the other hand, they act as mediators between stakeholders. As discussed above, this ambiguity is a major reason for the eroding credibility of the State.

This double role is, in a way, mirrored by the dual role of pTA. On the one hand, pTA aims at improving (and thus, implicitly, influencing) decision-making in a cognitive, normative and pragmatic dimension. On the other hand, pTA sees its role in providing a playground for deliberation and exploration and as a means of social learning.

There are also practical difficulties in the binding implementation of the results emerging from pTA processes. Even if a consensus among participants could be reached, it would not necessarily survive in the debate during the democratic process required to implement the policy in question. In fact, a consensus attained in a discursive framework may be seen as sidelining democratic decision-making by rendering it redundant.

Whatever model of democracy one favours, the questions remain the same: what is the legitimacy of a pTA procedure, and what is the legitimacy of its results? Democracy builds upon the possible consultation of all members of a group, and even corporatist approaches refer to the participation of all relevant actors in power of making binding decisions. The participants of pTA procedures, irrespective of the method applied, are not representatives of the entire populace, nor are they representative of all relevant civil society actors. However, in the context of a discursive TA, such completeness is not

necessarily required. A discursive participation rationale aiming at social learning is basically compatible with different concepts of democracy. Such procedures build on the communicative feedback to the discourse going on in society at large, and as such are a part of this wider societal discourse.

Chapter 3

Analytical Framework

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Introduction

The analytical framework consists of three 'dimensions' and the 'interrelationship' between them. The dimensions are: the societal background, in which pTA takes place (I); the institutional context, in which pTA is implemented (II); and the participatory arrangement itself, including its set-up and process, the underlying values, assumptions and goals, and its outcomes and impacts (III). By 'interrelationship', the dependencies between factors from within different dimensions are meant. In other words, a factor in one dimension, for example the problem definition (dimension III), may be understood as a function of a factor in another dimension, for example the institutional setting (dimension II), and vice versa. The analytical framework is based on a scheme originally developed by Dachler and Wilpert (1978) and first adapted for pTA by Joss (1998a).

The three dimensions encompass both the micro and macro levels of participation, from individual aspects, organisational issues, to wider societal perspectives. The main focus in this book, however, is the level of individual pTA arrangements and the TA institutions that instrumentalise them. The level of overall society is treated as a background dimension (as 'contextual boundaries'), within which pTA operates.

Figure 3.1 gives a general overview of the analytical framework. On the left side, the societal and institutional contexts are shown. They affect the constraints and opportunities of the various actors involved in defining and organising the pTA arrangement. Within each of these contexts several important aspects have been distinguished. These are explained further below. On the right side, the pTA arrangement is illustrated. The box consists of three parts:

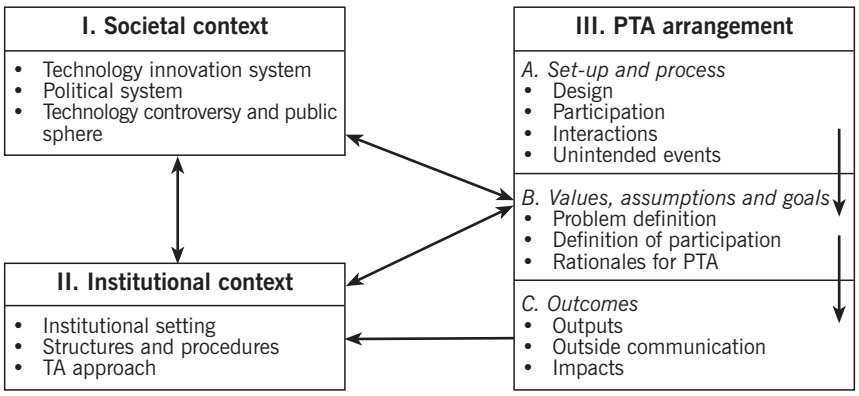


Figure 3.1 *The EUROPTA Analytical Framework*

III.A. 'Set-up and process' describes why certain choices are made with respect to the design of the pTA arrangement and how the pTA arrangement actually works out.

III.B. 'Values, assumptions and goals' describes how various actors perceive the societal problem at stake, how the organisers translate this into a pTA-research problem, and what role and function participation plays within the pTA arrangement for the various actors.

III.C. 'Outcomes' describes the results of the pTA arrangement in terms of its products, its media coverage, and the impacts it has.

The remainder of this chapter discusses the three dimensions and their interrelationship. The numbering of the various sections is consistent with the numbering in Figure 3.1. The same numbering has also been applied in the research protocol (Chapter 4), which was designed on the basis of the analytical framework.

Societal Context (I)

Considering the outline of the interrelationship between science and society and the role pTA in the previous chapter, several aspects of contextual boundaries seem relevant for an international comparison of the features, functions, constraints and benefits of pTA in modern societies. Here, the questions of interest include: what are the particular features of decision-making in different countries with different political cultures and traditions? and what consequences does this have in terms of the definition, implementation and outcomes of pTA methods?

A distinction may be made between the following three aspects: technology innovation system; political system; and technology controversy and public sphere.

Technology Innovation System[1]

Innovation has long been modelled as a linear process going through a number of successive phases (research, development, demonstration, diffusion, and utilisation). The initiation could either come from the engineers (technology push) or from demand (market pull). The gap between these two extreme theses has progressively narrowed. Nowadays there is a general consensus that innovation is born of a narrow coupling between science and technology on the one side and the market on the other. Case study research has underlined that innovation involves a lot of back-and-forth movement between demand and supply side considerations. Consequently, the linear model of innovation has been replaced by an interactive network perspective.

To include and study the iterative dimension of the innovation process, Callon *et al.* (1992) introduced the concept of 'techno-economic network' (TEN). A TEN is defined as 'a co-ordinated set of heterogeneous actors – public laboratories, technical research centres, industrial companies, financial organisations, users, and public authorities – which participate collectively in the development and diffusion of innovations, and which via many interactions organise the relationship between scientific and technical research and the marketplace' (Callon *et al.*, 1992).

TENs are organised around five major poles, three of which are the supporting pillars: a scientific, a technical, and a market pole (Table 3.1). Within the *scientific pole* certified scientific knowledge is produced by scientists, who work within universities and public or private research centres. The main actors within the *technical pole* are engineers and technicians working in technical laboratories in companies, co-operative research centres, or pilot plants, where they conceive of, develop or transform artefacts destined to serve specific purposes. Within the business pole, general managers either try to anticipate new consumer demands or translate demands expressed by users into products. The *consumption pole* corresponds to the universe of the consumer, who buys, uses, and thus economically values the artefact. To emphasise the role of politics, Van Est (1999) added a fifth *political pole*. The political pole is similar to a regulation pole. It is, however, a somewhat broader concept which refers to the whole policy subsystem (as part of the innovation network).

The notion of innovation network involves the idea that innovation can come into being at any point along the network. It would be too simple a model to see the process of innovation – from 'invention' to 'diffusion' – as mainly driven by science and technology themselves and an inherent (socially independent) dynamic of technological rationalisation (technology-push). Social demands as formulated by users, consumers and also the State are driving the process of innovation (demand-pull). Technology development is a social process of shaping technology in which different social groups with different interests and values are included.

1 This section is based on Van Est (1999, Fig. 7.1).

Table 3.1 *The Structure of the Innovation Network*

Pole	Science	Technicians	Business	Consumption	Politics
Actor	Scientist, Researcher	Engineer, Technician	Manager	Consumer	Policy-maker
Role	Production of scientific knowledge	Design and development of an artefact	Production and marketing of a product	Consumption and economic valuing of the artefact	Stimulation and regulation of innovation

Source: Van Est, 1999, Fig. 7.1.

Technology Definitions and Characteristics

The technology definition may be determining the way the actors approach a technological problem. Further, the state of the technology makes up a boundary for the processes that may go on between the actors. The characteristics of technology can be described from many viewpoints. One is time, another complexity.

The technology development phase

Restrictions and opportunities of pTA procedures might depend on the stage of technology development (maturity of technology) pTA comes in. Opportunities to influence technology development according to the so-called 'Collingridge-dilemma' can be seen as high at an early stage of development, but knowledge about possible impacts is little, and low when technology is applied, though we know more about impacts. From this perspective TA can be seen as 'too early' or 'too late' with regard to, for example, decisions about 'stop' or 'go' for technology development or implementation. With regard to shaping and regulation, chances to intervene in technology development and technology application are to a high degree given at any stage of the trajectory. Whether it is 'too early' or 'too late' is not determined by objective technological features but depends on interests, power and willingness of social and political actors. Nevertheless the 'maturity' of technology – the stage of development – can influence the subject and function of pTA procedures, because the decisions needed may be different at different phases of the development. For example, one can initiate a social process of defining goals of technology development at an early stage, or strive for consensus on regulation for application of a more or less fixed technology in later stages.

'The substitution ladder'

The substitution ladder characterises technology as hierarchically organised. Technology decisions and the assessments behind them can be seen as a matter of substituting one solution with another. An organisational solution (meeting and talking at the pub) can be substituted by a technological solution (talking by telephone). A technological solution (flying domestic flights) can be substituted by another technological solution (riding high-speed trains). Or a technological solution (the use of contraception) can be substituted by an

Table 3.2 *Examples of Technological Subsitition at Different Complexity Levels*

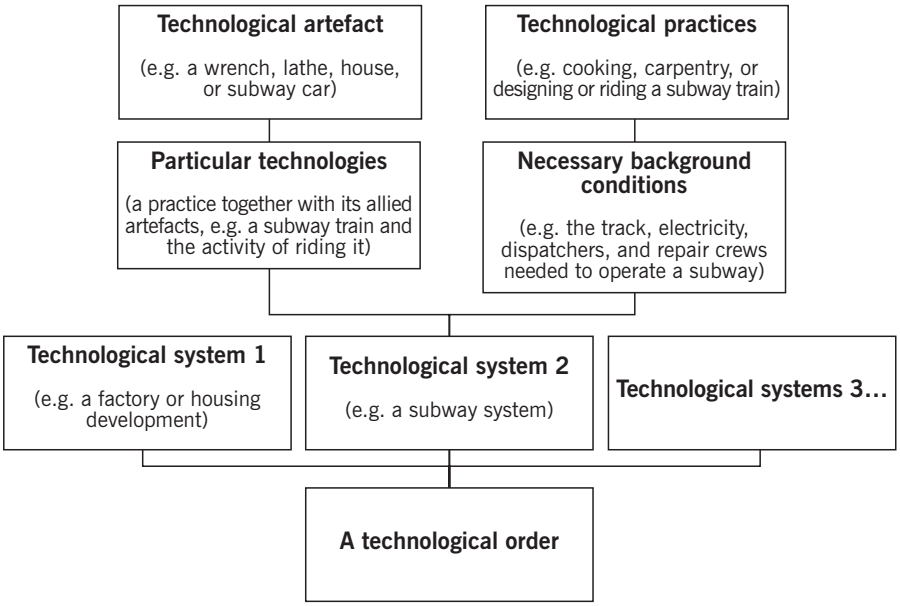
The process level	This is the normal level on which the production process is rearranged in order to provide a more environmentally sound technique, e.g. in terms of increased restriction of waste to outside recipients such as water and air.
The materials level	This is the case in which you substitute one element in the product for another of hopefully more 'benign' character. The substitute of mercury in batteries for other substances is such an example.
The component level	A new technical design could provide a new plug-in function without changing the overall feature of the 'old' technical solution. The use of catalytic emission control of automobile exhausts could fall in this category.
The subsystem level	If the 'car' is the system, then the varying engine solutions could be seen as subsystems. The substitution of the old gas-motor for an electric one could serve as an example.
The system level	Given the strategy, e.g. that people in a big city setting shall be able to move every day between their homes and workplaces, wherever these might be situated, the substitution (or shift of emphasis) between a private car solution as systems design and that of mass-transportation exemplifies this level.
The strategy level	The manipulation of the structural design in town planning in considering closer affiliation between homes and workplaces provides a substitution for a solution that is built more on a random distribution. Such a change could result in reduced transport loads overall and in certain energy reductions of benefit for the urban environment. Still the goal of getting people between point A and B is valid at this level.
The value level	This level could be exemplified by questioning the need for physical transport as a part of society's goal structure. At the value level, different basic demands as they have been conceived are under scrutiny. At a more modest level of change more local or regional production of agriculture products, connecting production and consumption geographically, is emphasised.

organisational solution (building up anti-sexuality morals). Moreover, technology can be seen as organised at different complexity levels. Substitution of technology can take place inside these levels, or can be imposed by changes on another level. The examples in Table 3.2 are cited from the SIIESTA report (Svenson *et al.*, 1988).

It is the idea of the authors of the SIIESTA report that, at these different levels, specific 'analytical tools' are needed in order to find proper substitutions for known technologies. It therefore needs to be considered with which level(s) the issue of a TA case works.

The technological order

Another way of looking at technological complexity that includes the social activity of using and organising technology is presented by Sclove in *Democracy and Technology* (1995). Sclove presents the 'hierarchic relationship among basic technological concepts' as seen in Figure 3.2. This approach differs from the substitution ladder in its system approach. Sclove sees the artefact and its use as two sides of the same hierarchical level. The result is a picture that can be compared with Chinese boxes.



Source: Sclove (1995)

Figure 3.2 *Hierarchical Relationship among Basic Technological Concepts*

Organisational complexity

It follows from the models of complexity above, that technology might be surrounded by different organisational systems, depending on the complexity or development of technology. The technology can in other words be seen as more or less embedded into organisational structures.

The development of a fuel cell may serve as an example, which at the same time shows that the level to which a certain technology is embedded in the social organisation is to a large extent a function of time:

- An energy-producing machine (e.g. the fuel cell) may at the development of its basic technologies be outside direct influence from society and politics as such.
- When it begins to be developed into a product, politics comes nearer, defining standards that make it possible to integrate the fuel cell into existing energy systems.
- At the time, when the fuel cell is ready for marketing, and the first products are introduced, the introduction will be hindered by producers of competing technologies (e.g. combined heat/power turbines).
- And at a time when the fuel cell has been introduced and is a standard technology, it will be so embedded into society that changing it will be hard, because big organisations are built upon the existence of a well-known, widespread, fuel cell technology. The fuel cell has become strongly institutionalised, and thus harder to change.

Political System

For the State, the problem of uncertainty manifests itself as a crisis of management and as a crisis of legitimisation of technology policy (see Chapter 2; see also, for example, Hennen, 1999). How the State deals with these crises and what role pTA plays depends on several factors.

All Western democracies are mainly liberal and representative democracies. The principal political role of the citizenry is to elect representatives to carry out decision-making on their behalf. This restricts the role of participation mainly to deliberation or lobbying, and excludes direct participation in decision-making. The liberal model of democracy competes with a republican view of democracy according to which the citizenry is given the opportunity to decide directly on issues of their own concern. With regard to the political system, the role and power of the public sphere, or civil society, may differ between countries according to political traditions. Such differences may be concerned with how the strong elements of this republican model are included in the political system (such as referenda, or initiatives), or about pressure (like a social movement) to include such elements. In the context of the EUROPTA project, this plays an important role if there is a tradition of involving citizens in deliberation processes (participatory culture).

The role of the political system in relation to science and technology is twofold: to promote science and technology and to regulate their risks and possible social impacts. Of relevance to analysing a technological issue are therefore institutions and customary procedures of co-operation to fulfil these tasks, and the role of the public, the expert community, industry etc. in this procedure. The attitudes towards public participation in technology policy, and the role of TA institutions in the twofold function of policy may be characteristic for national technology policy culture.

What Is a 'Social Debate'?

Social debate is not a clearly defined concept. Like any type of debate, a social debate implies an exchange of ideas and viewpoints between actors. However, this exchange does not have to take place face-to-face or simultaneously. The distinguishing characteristic of social debate is that it goes beyond private interest and is concerned with the public interest at large.

A social debate is to a large extent an elusive phenomenon. It cannot fully be institutionalised, and is in principle unlimited in time, space and content. Also the number and range of actors involved within social debate may vary widely. People who are directly involved in the technology issue at stake may take part in the social debate, but so too can people not directly involved. While social debate is often dominated by specialists and has elitist features, interested ordinary citizens may also be involved. Finally, the nature of social debate may take on many forms. On the one extreme, the social debate may evolve into a 'public debate' including discussions in the media etc., which may result in a national public controversy leading to mass

demonstrations. On the other extreme, it may also be contained within small academic circles.

Technology Controversy and Public Sphere

Technology is a contested issue in modern society, but there may be enormous variations in terms of public attentiveness and intensity level, and nature, of public controversies. These differences may be an important factor determining the conduciveness of pTA. Take, for example, the issue of genetic engineering, which is a highly controversial topic of public debate in many European countries, but less so in the USA. A highly controversial style of public debate on technology with well-organised interest groups and intransigent positions and stakes may prove to be a less favourable environment for pTA than a more open and disinterested style of debate, or vice versa. This may vary not only from country to country, but also from issue to issue within a country. There may also be different traditions of protest in different countries. The USA, for example, is known for its relatively adversarial style of technology controversies, which nevertheless does not lead to militant forms of protest, but instead to judicial forms of conflict resolution.

Considering the preceding theoretical reflection, the most decisive variable here might be public trust in experts and the political system of regulation. Trust is dependent on different interdependent variables, including: previous experiences with experts and the political system; the traditions of involving affected people in decision-making; the role of new social movements in public debate; the role of the media; the accessibility of the media for all stakeholders in a controversy; the role of alternative scientific institutions outside the traditional establishment.

Timing

The point in time, relating to the maturity of a technology or public debate, at which pTA is deployed, may be crucial for the design as well as the possible impact of the pTA arrangement. Participation may take effect at an early stage of technological development so that social needs and demands can be built into the development process proactively, and at an early stage of public debate so that discussion is not marred by too much heated confrontation. Participation may occur in the regulatory process of introducing a technology onto the market, or it may occur at an even later stage, when the repercussions of a technology are under discussion. The expectations regarding the function of participation may vary considerably in this respect.

Institutional Context (II)

The way pTA arrangements are embedded institutionally is likely to deter-

mine decisively their meanings, structures and performances. Thus, in order to assess pTA arrangements, their institutional contexts have to be looked at, paying attention to both internal and external factors defining the institutional context and conditioning pTA arrangements. Internal factors include the structures and procedures of TA institutions, such as the available financial and human resources, the understanding of TA at work and the processes of selecting issues for a project. External factors include the role of the TA institution in relation to science and technology development, public debate, and public policy- and decision-making.

For the purpose of the proposed analytical framework, a distinction is made between three related aspects that characterise dimension II: institutional setting; organisational structures and procedures; and TA approach.

Institutional Setting

In current social science, the important roles of institutions and institutionalisation are broadly acknowledged. A large body of literature exists on the importance of institutions, institutional settings and institutional development in building a capacity for performing certain functions (see, for example, Powell and DiMaggio, 1991; March and Olsen, 1989). Vig performed a study of practices in five parliamentary TA organisations in Europe (Denmark, France, Germany, the Netherlands, UK), which was mainly an institutional analysis (Vig and Paschen, 2000). Following Hibbing (1988) he defined institutionalisation as the process by which a body acquires a definite way of performing its functions – a way that sets it apart from its environment and that is independent of the membership and the issues of the moment. This is likely to occur over a period of time as the institution adapts to or modifies its environment. According to Vig and Paschen (2000), this implies a number of things: institutions must gain recognition of their functions and boundaries from others in order to operate according to their own rules; they must develop political support from other elite groups and often from broader constituencies to establish legitimacy; and they must establish clients for their products by serving their interests. This requires building both diffuse support (reputation for credibility, objectivity, fairness, effectiveness, etc.) and specific support (personal relationship with key actors).

Vig and Paschen's main question with respect to institutionalisation was how much of a difference it makes how a parliamentary TA institution is organised. They therefore wanted to know:

- To what extent parliamentary TA institutions embody cultural biases or policy preferences reflecting their political founding and organisational environment and determining how they define problems, what policy discourses and methodological procedures are legitimate, and thus what the likely range of policy options will be.
- How different institutional arrangements affect their 'capabilities' and 'effectiveness' in carrying out various functions. How different institu-

tional structures and methods result in different kinds of products and impacts.

Following the results of Vig and Paschen, there are strong reasons to expect that the use of a certain pTA arrangement, its operationalisation and outcome will depend on the institutional context of the organisation/institution that performed or co-ordinated the project, the relationship it had with the broader societal context, its history (past performance and experience) and its brief (formal and informal).

More specifically, the choice of a pTA arrangement, the criteria it has to fulfil as well as the legitimacy of the results are likely to be related to the institutional context in a number of ways, particularly to:

- the wider institutional context, formal and informal, dependencies and relationships to academia, parliament and social groups;
- the history of the institution and the related process of trust-building (does the institution have a straight history or is it erratic in its conduct, is the organising institution *ad hoc* or is it a long-standing organisation?);
- the formal brief and the informal connotations of the brief (e.g. does the formal brief hint at/demand participation, does this brief specify the type of participation of, for example, social groups, the wider public?);
- the issue-related institutional context, e.g. the discourse coalitions around a certain issue and the role of the TA institutions amidst it.

An institutional analysis should take into account the context in which the institution operates in the sense of institutional dependencies of a TA organisation, embedded in a larger framework of a political regime.

The institutional setting of TA is likely to shape pTA in two ways:

1. The type of institutionalisation may directly determine the role of pTA. If a TA institution is linked to the policy- and decision-making processes, then the results of its pTA arrangements are more likely to be used in these processes than if a TA institution is detached from them. In the latter case, pTA may then take on a different role, such as informing public debate. It follows from this that one and the same pTA arrangement could take on different roles, depending on the institutional settings.
2. The type of institutionalisation may also determine the role of pTA in terms of perception of the TA institution by various social actor groups. If a TA institution enjoys widespread credibility and legitimacy, then pTA is more likely to be taken seriously than if the institutional setting is questioned, or even rejected, by some social actor groups.

TA organisations are relatively young and therefore may still be in the developmental phase of institutionalisation, in the sense of Hibbing (1988). Additionally, the EUROPTA analysis also included *ad hoc* institutions that do not have the status of standing organisations.

Organisational Structures and Procedures

PTA is also shaped by practical aspects of how TA institutions operate. Sometimes, the discussion of pTA stays at a rather abstract level where little notice is taken of the practical conditions under which TA institutions have to carry out their projects. In reality, however, it is usually these conditions which shape pTA arrangements. These conditions include the amount of financial and human resources available, the pressure of time for completing projects and the imposition of certain restrictions on the choice of subject.

PTA arrangement may reflect the internal organisational culture, such as the way projects are selected, organised and analysed, which may be more or less conducive to the use of participatory methods. One example of such cultural shaping of the work of the TA institution may be found in the way that TA institutions make use of the 'TA toolbox'. Timing needs may be coped with at an institutional level by the use of a set of TA methods, some of which may give a response to a problem in a few weeks, others in a year or more. If the institution has a set of methods, most timing needs can be fulfilled, and priority between timing and, for example, comprehensiveness becomes visible. The toolbox in this respect reflects how the institution judges the importance of, for example, timing versus other qualities of a project.

Technology Assessment Approach, Definitions and Classifications

Over the years, TA has been defined in many different ways, reflecting the broad range of meanings given to this policy tool. For a long time the former US Congressional Office of Technology Assessment (OTA) was the hallmark for TA. TA was seen as 'the type of activity conducted by OTA', but other TA organisations that were inspired by OTA typically refined the definition of TA in the course of the developments to suit their particular institutional and cultural requirements (see, for example, Van Eijndhoven, 1997; Joss, 1998).

Several attempts have been made to typify TA by classifying forms of TA. Smits and Leyten classified TA according to its function, relative to specific clients (policy-makers, parliament, short term, long term) (Smits and Leyten, 1990), but paid no specific attention to participation. Van Eijndhoven (1997) categorised existing TA practices in four so-called 'TA- paradigms': classical TA, the OTA paradigm, public TA and constructive TA. Apart from the classical TA, which in its original form was based on a classical view of scientific knowledge and its use in politics, they all include some form of participation at one stage or another. The OTA type of TA comes closest to the classical view of TA as a science-based study. In the typical OTA context such an analysis was started up interactively by strong stakeholder involvement in the problem-seeking or agenda-setting phase and by an extensive external reviewing process. Many of the TA activities in Europe are adaptations of the type of TA conducted by OTA. Public TA and constructive TA both spring from the idea that the basis for decision-making about technology should be broadened and share the conviction that interaction among actors is important in

conducting assessments. Constructive TA is directed at influencing technological choice by broadening the design process of new technology. Public TA, of which the Danish type of consensus conference is the typical example, emerges from a specific ideal of participatory democracy.

Bechmann and Frederichs (1996) typified TA from various views of democracy. They categorised TA into 'instrumental', 'elitist' and 'democratic' models on the basis of different models of the functioning of democracy. Consequently, the meaning of participation may change significantly, depending on the underlying model. In the instrumental model, participation may play the role of a consultative instrument in support of the representative decision-making mechanisms. In the elitist model, participation may have the function of disseminating information from scientific institutions to both politics and the general public. Finally, in the democratic model, participation takes on a key function by giving the public at large a constitutional role in assessing science and technology.

PTA Arrangement (III)

The *arrangement character of pTA* relates to three interrelated features. First, the term 'arrangement' implies that a certain participatory TA method is normally embedded within a project management structure, of which it only represents a certain phase (see below). Second, the arrangement character of pTA points to the possibility that it constitutes several interrelated consecutive or simultaneous participatory and/or non-participatory events. A pTA arrangement may be both a single event and a trajectory of events, which might involve different actors and possess distinct participatory features. Third, it relates to the political and institutional setting in which the pTA process takes place (see above). This means that the pTA arrangement will likely reflect the political and institutional conditions under which it is set up. A pTA arrangement may be part of a larger project but may also be identical with it.

Other terms often used together with arrangement are: project, method and technique. Within the EUROPTA project we define 'project' as an *ad hoc*, and often changing, initiative that is set out to reach a certain goal. The project may be loosely defined, shaped during its time-span, for example outlining its methods and budget/financing as it proceeds. Alternatively, it may be very precisely defined from the beginning, by a project description including analysis of the problem situation, methodology, project organisation, time plan, budget etc. A project can make use of one or more methods. 'Method' is a procedure for interaction between people, and can characterise the whole procedure of the project (the consensus conference is a method that to a high degree describes all procedures in the project) or it may only characterise a procedure that is suited for parts of a project. Finally the 'technique' is a trick that makes it possible to produce certain results inside a method. This may, for example, aim at establishing certain group dynamics, at making use of the

participants' creativeness, or at making the participants prioritise their findings. Like a method can be dominating a project, a certain technique may fill much of the landscape in a method (vision-making may serve as an example).

Stages of pTA arrangements

A pTA arrangement consists of a series of activities structured in time. In principle, numerous ways exist to phase such a process. With respect to the consensus conference, one might, for example, distinguish between a phase in which the members of the lay panel are recruited, and a phase in which the lay panel is being informed, a phase in which the lay panel publicly interrogates experts, etc. However, the concept of pTA arrangement does not only relate to the set of events that constitute the methodological set-up. The term also implies that a certain participatory method is part of a project management structure, of which it only presents one element. In project management literature, phases are characterised by a specific task, and consequently the phasing of a project is determined by the nature of the project. For example, technical projects often get phased in a different way from research projects. Based on Groote *et al.* (1995: 20–1) we may distinguish the following seven phases with respect to pTA arrangements:

1 The *initiation phase*, in which the still vague ideas around a project are being crystallised and a first rough picture is described. It is also decided what is not going to be dealt with in the project. This decision is often made at the management level of the TA institute, and there might be a large gap in time between this decision and the actual start of the project.
2 The *definition phase*, in which a thorough analysis of the problem and/or the goals of the project is started. In this phase the quality criteria for the end result are being formulated and the work structure of the project is set up. Sometimes preliminary studies are initiated, experts interviewed or workshops organised in order to get the focus right and examine what kind of answers can be expected from the TA.
3 The *design phase*, in which, on the basis of the demands formulated in the former phase, alternative solutions are being developed and prepared in order to come up with the best approach. Based on the structure and delimitation of the problem, a certain (p)TA approach is chosen, the design of the (p)TA arrangement is made, and the various activities within this arrangement are planned.
4 The *preparation phase*, in which the realisation is being prepared. For example, in case a workshop is part of the pTA, an appropriate place to organise the workshop is arranged during this phase, selected participants are invited and a workshop leader is hired.
5 The *realisation phase*, in which the project result is indeed being realised. Now, the various activities (studies, workshops, conferences etc.) within the pTA arrangement are carried out and reports are written. It is often in

this phase that participants become involved in the pTA. Apart from the project management activities, this phase also contains the 'interpretation' and 'option formulation' – the making of politically relevant outcomes of any pTA arrangement.

6 The *follow-up phase*, in which the result is being used and maintained: the results of the pTA arrangement are published and disseminated by the TA organisation. Dissemination can be done in several ways, for example, by means of sending out reports, organising a conference around the theme of the pTA, giving lectures, briefing politicians. The keyword here is 'communication'.

7 The *impact phase*, in which the results of the pTA are used either inside the TA organisation, for example in order to improve its methodology, or outside the TA organisation, in particular in the political sphere. In principle, the pTA arrangement is finished when the results of the pTA are produced and disseminated by the TA organisation. However, from now on the products delivered by the TA organisation will largely live their own life and have an impact on the 'outside world'. This can still be supported by the TA institution or the pTA participants. The key word here is 'action'.

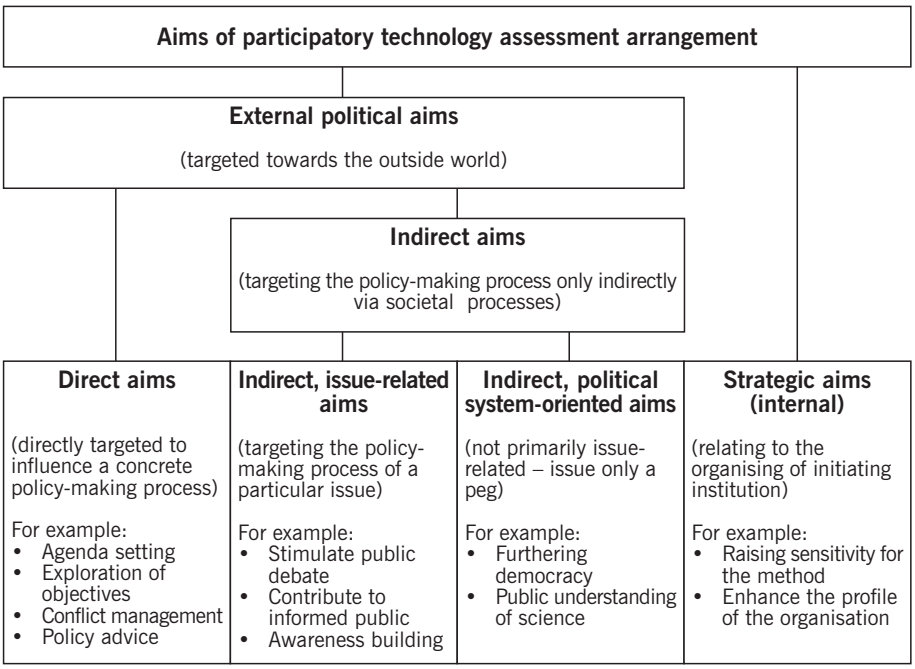
Note that there are different 'meta-phases' within each pTA arrangement: the first three phases are 'strategically' relevant because the direction of the pTA arrangement is determined here. Phase 4 is organisational work, phase 5 is the 'core element' of the pTA arrangement and phases 6 and 7 are 'politically' relevant.

Set-up and Process (III.A)

The following part is concerned with the 'physical' side of pTA arrangements, that is in particular their structure and procedure and the mode of communication encouraged between participants. The properties of pTA are relevant, because they signify the 'meeting point' between pTA theory and pTA practice. An analysis of pTA properties may look at the following aspects: at the *design*, i.e. the structural and procedural characteristics, and in particular at the *participants*; at the *interactions*, i.e. the type of participation and communication within the pTA arrangement; and finally at the *unintended events* that make up practical constraints that management have to face during a participatory arrangement.

Design

There are a number of variables defining the *structure* of a pTA arrangement, including the number and range of people involved; the duration of the project; the methods used; the degree of public access; and the link to policy-



Source: Nentwich (1996, 1998)

Figure 3.3 *Aims of pTA Arrangements*

making. Following the variables used by Nentwich (1996 and 1998), it is suggested here to describe the overall design by the following dimensions:

- The *aims* of the pTA arrangement may be twofold: first, externally targeting towards the outside world. This may be achieved by directly addressing the policy-making process or indirectly aiming at it by influencing societal processes. Second are the 'strategic' aims. They are internally oriented and are related to the organising institution. Of course an arrangement may actually have one or a combination of these aims. Figure 3.3 illustrates the various possible aims of pTA arrangements.
- There may be a direct link between the citizen's input and the possible policy outcome. We may say that an *indirect* pTA arrangement needs some form of mediator within the political system – generally a (group of) politician(s) – before the input can be translated into political action. By contrast, a *direct* pTA arrangement has a non-mediated effect on the political system (this seems a rather theoretical option and will very rarely be the case).
- A pTA arrangement would be *active* if the main initiative comes from the citizens (grass-root pTA), and *passive* if citizens are used as a source of information or of support or rejection rather than being agents themselves, i.e. if pTA is 'imposed'.

- pTA arrangement may be *formal* or informal. Formal pTA would have procedural rules and, thus, is rooted in the legal sphere and could be invoked in the courts if the citizens have not been consulted properly or if a specific rule has not been applied lawfully. By contrast, *informal* pTA would be practised without a legal basis and therefore is not to be litigated. The distinction 'formal'/ 'informal' does not (always) correlate with the legal value of an input channelled by the pTA arrangement; although 'informal' pTA cannot be binding in legal terms (because of the lack of a legal basis providing for this consequence), 'formal' ones might be either 'binding' or not.

Besides the structural aspects there is most notably the *procedural dimension* of any pTA arrangement. They differ in various procedural aspects, such as the processes by which a participatory project is launched, how participants are selected, what kind of information inputs the organisers collected or generated to feed into the pTA process and when. This leads to the question, what concept of expertise and of knowledge dominates the proceedings? For instance, there are differences in the type of testimonies involved (system experts, counter-expertise, expertise based on a broader concept of 'informal' knowledge).

Another procedural aspect is the *connection to the external world*. How open or closed are the proceedings? This relates, for example, to the degree of media involvement (internal/external), presence on the Internet etc.

Finally, timing is always crucial in TA projects, and this is particularly true for pTA arrangements within them. Based on the procedural characteristics of a pTA method, we may address the question, what kinds of timing demand can the method live up to? Here we may ask whether it is flexible enough, fast enough etc.

Participants

The *range*, *number* and *types* of participants are key characteristics of any pTA arrangement. Different types of participants are for example: knowledge carriers (experts), interest/stakeholder groups, decision-makers, people affected by the technology, general (non-affected) public. In some arrangements, the composition of participants may change over time.

The question of how the participants were selected is an important characteristic of an arrangement: the two main principles used can be 'representativity' – i.e. that participants should reflect the relative weight of interests, views, arguments and groups in society, versus 'balance', i.e. the attempt to involve people from all 'relevant' groups (arguments, viewpoints, interests and other background variables) regardless of their relative strength in society. Apart from characteristics related to viewpoints in a wider sense, 'balance' and 'representativity' may also refer to gender, regions, urban/rural areas, education etc. (demographic parameters). The participants are carriers

of values, and while it seems to be generally acknowledged that the more values included the better, it is difficult to decide what values are relevant in the context. In other words, the *diversity* of key players involved in the proceedings is a distinctive characteristic.

On a more detailed level, there are various selection methods, such as random selection, volunteering, categorical self-selection, selection through networking, and co-nomination (assignment of representatives from societal groups, which need to be organised interests for this purpose). Here, a crucial aspect is how biases are avoided or accounted for in the selection process.

Another important aspect in this context relates to the *role* of the participants during the pTA arrangement. Different groups of participants may be involved in *different stages* of the arrangement. Who is involved in the early stages of the procedure and in the implementation phase are distinctive features, because of the possible impact on procedures and scope of the arrangement. Participants may have different influences on the procedures, e.g. on agenda setting, on information gathering (access to external knowledge), selection of expert witnesses, bringing in new participants. Their role may be consultative only (giving advice, sharing knowledge) or, at least to some degree, decisive or assessing. The purpose of involving participants may also be to let them learn from the process. Finally, the role of the participants differs according to the timing of the arrangement. If the pTA follows from a general public debate on that subject, both the role in the framing and the mobilisation of the participants to participate may be different from a case in which the pTA does not base itself on an existing public controversy.

Interactions

The interaction between the various participants is another distinctive procedural aspect of any pTA arrangement, for example, the kind of communication that is encouraged to take place between participants in the arrangement, what is expected of the various participants and how they engage in the participatory process are all aspects of the procedure that define the level of discourse in the process. An ideal-typical consensus conference, for example, encourages dialogue between lay people and experts, with a view to considering expert knowledge (cognitive claims) in the context of wider social expectations and needs (normative claims). Emphasis is on the clarification of different perspectives and a common frame of discussion. An ideal-typical scenario workshop, in contrast, encourages co-operation between different types of experts where common action is required to tackle a problem area. Emphasis is on the accommodation of different perspectives as a way forward for future action.

The *rules of communication* (who is allowed to speak when; who can address who; (un)equal opportunities to express themselves and to access information etc.) may differ considerably from pTA arrangement to pTA arrangement. The rules may be open to revision throughout the proceedings

or, by contrast, may be preconceived before the proceedings take place and therefore rigid. Furthermore, apart from the formal rules, the process of communication may develop in distinct directions according to the strategies pursued by the participants and the prevailing negotiation culture. One important aspect of communication in this respect is the issue of *text transformation*, i.e. the way the various texts and meanings produced during the pTA are processed from one phase to the next, or in other words, how is the knowledge generated at one stage carried over to the next? The question is, who is responsible for the text transformation, what difficulties are encountered, how are they resolved and how does this process of transformation influence the reliability of the end results?

Unintended Events

When discussing the properties of pTA arrangements, we also need to keep in mind events that may occur during a pTA initiative and that may influence the outcome. A pTA arrangement may envisage a kind of communication between participants that eventually turns out to be unfruitful. This may reveal useful information about the nature of the pTA arrangement.

A comparison of different case studies, therefore, requires a description of events during these pTA arrangements. Although the distinction is not absolutely precise (in particular if inside actors become outside actors), we may, on a principal level, distinguish between *external* and *internal* unintended events: the former may include change of government, press campaigns by non-involved stakeholders, related TV programmes, new technological development etc., whereas examples of the latter may be that some participants left the pTA, that parallel campaigns by actors are raised, or that some interest groups boycott the pTA, which may trigger the need for an emergency design to 'save' the arrangement.

The influence of such events may be of crucial importance to the success or failure of a pTA arrangement. Hence, the ability of an arrangement to cope and deal with such events is of interest. This question may be addressed by asking how 'robust' against outside influence the arrangement may be, but also by looking at the possibly positive or constructive inputs to the arrangement brought about by the event.

Values, Assumptions and Goals (III.B)

The use of pTA may vary from case to case because of different underlying values, assumptions and goals. These may result from the kind of conception of TA and of participation at work, from the democratic traditions/systems in place, and from the role played by science and technology (see dimensions I and II). As a result, they may vary from institution to institution and from country to country and develop over time. They may also vary within institu-

tions, or within countries, as the various social actors engaged in pTA arrangements may have different, and at times contrary, outlooks on the issue of pTA, and thus engage in or abstain from it for different reasons.

For the purpose of investigating the values, assumptions and goals brought to bear on pTA, it may be useful to distinguish between the following three related aspects: problem definition; definition of participation; rationale for pTA.

Problem definition

It has long been assumed that actors' interests provide a self-evident starting point for understanding purposive behaviour. Such an approach, however, fails to address the question of origin of interest. Recent approaches use frames of meaning, rather than interests, as their focus, since these are more inclusive and more verifiable. Grin and van de Graaf (1996) distinguish between four types of elements within the action theory of an actor, the latter being 'the whole of the beliefs of that actor, both the more generic ones and those pertaining to a specific case' (Grin *et al.* 1997: 33):

> *Specific notions regarding a given situation (first-order beliefs):*
>
> - *How does the actor assess the costs, effects and side effects of various solutions to the problem as he or she sees it?*
> - *What exactly does the actor see as the problem in a given situation (the challenge, the opportunity)? This problem definition indicates what is going on in the eyes of the actor.*
>
> *Underlying, more generic notions (second order beliefs):*
>
> - *What background theories (ways of thinking and acting) does the actor employ?*
> - *What deeper preferences does the actor eventually want to satisfy?'*

Friend and Hickling (1997) are discussing collaborative decision-making in conditions of uncertainty. They present five broad dimensions in which difficult choices of balance tend to arise in the management of a continuing process of strategic choice. According to Friend and Hickling (1997: 8) there is a choice between:

- a more *focused* and a more *synoptic* treatment of problem scope;
- a more *simplifying* and a more *elaborating* treatment of complexity;
- a more *reactive* and a more *interactive* treatment of conflict;
- a more *reducing* and a more *accommodating* treatment of *uncertainty*; and
- a more *exploratory* and a more *decisive* treatment of progress through time.

The values, assumptions and goals of a pTA arrangement are also manifest in the way the problems to be tackled, or issues to be considered, are defined. There are various categories of problems that pTA is expected to address:

- One type of problem is the perceived lack of public understanding of the issue at stake. The public may be thought of as lacking factual knowledge relevant to the issue at stake in the societal debate. In order to enhance the ability of the citizens to assess the issue themselves, the TA activity may be seen as helping to disseminate information and assessment capabilities to the wider public. This type of problem may call for public enlightenment and wider debate activities.
- A comparable type of problem is the perceived lack of scientific rationale of political decision-making. Political institutions may be thought of as having a need for knowledge (maybe not realised by themselves). The reason may be that knowledge simply has not diffused into the political processes, or that it is kept away from the process as part of the power game. Here, TA may be seen as helping decision-making by bringing in a relevant knowledge background.
- A perceived lack of democratic debate, following a deficit of trust and legitimacy, makes up a third type of problem. Here, pTA (as compared with more expert-oriented TA) may be seen as lending the political sphere credibility by surrounding it with debate and by opening up political issues to the general public. A precious side effect may be the information about standpoints and opinions that the process brings into the political debate.
- The innovation system might have its own dynamics, separated from the public debate, and might even be embedded in long and lasting traditions for corporatism. This may lead to conflicts about attitudes, values and opinions between the general public and the innovation system. Such situations may be perceived as a lack of 'scientists' understanding of the public' (in contrast to the dominant perception of a lack of 'public understanding of science'). This may call for consultative processes in which representatives of the public give their assessment on the issue.
- Technology may be seen as embedded in institutional structures, and accordingly the reshaping of technology depends on the openness of the same structures (industry, retail, public service institutions etc.). The TA organiser may perceive it as a problem, if public debate expresses a need for new developments, but the involved institutions for some reason are not able or willing to embrace a development process. With these kinds of problems the pTA answer would often be to set up mediation processes.
- A need for comprehensiveness and co-ordinated strategies may be identified by the pTA organiser. Maybe a lack of co-ordination or communication between relevant scientific disciplines, governmental sectors or important actors is evident. A cross-disciplinary strategic analysis, cutting across traditional communicative barriers, might be necessary, and a pTA arrangement might be the right tool to use.

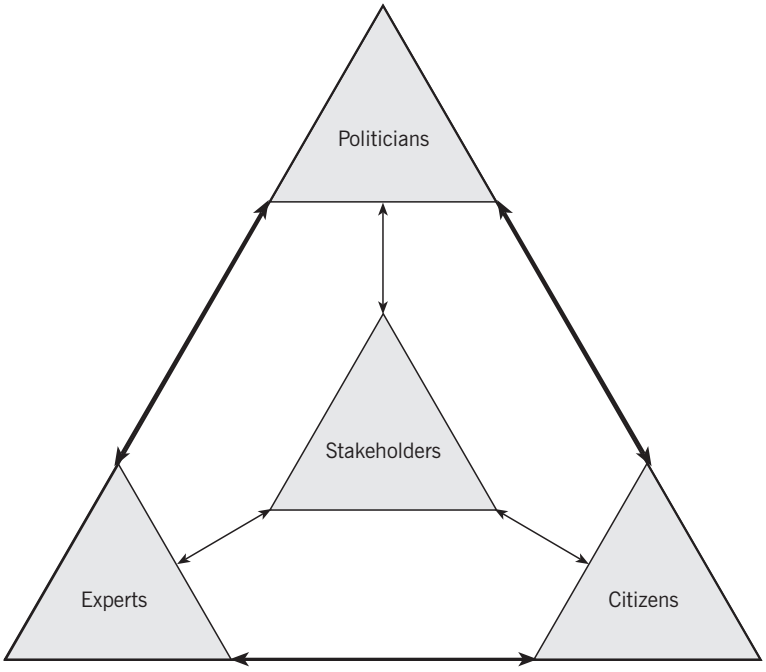


Figure 3.4 *Bridge-building in Society*

In a more general sense, the problem setting may be perceived as the need for bridge-building in or between four important communities in society: citizens, politicians, experts and stakeholders (see Figure 3.4).

Each of the four groups may be thought of as having their specific qualities (values, objectives, capabilities, limitations, cultures etc.). A problem may be seen as a conflict and/or need for communication between/inside these groups, stemming from the specific qualities; the participatory procedure may be seen as a specific answer to the conflict.

Definition of participation

The answer to the question, what is participation? has obviously important implications for the way pTA is viewed. This question, simple as it may look at first, goes far beyond the practical aspects of how participatory methods are arranged and extends to the fundamental discussion of how individuals interact with one another, how people are organised in communities, institutions and societies, and the value of participation. Therefore, in order to be able to analyse the meaning of participation within a particular pTA arrangement, one has to ask questions about the wider understanding of participation at work. It may be that participation is discussed, for example, within a direct democratic framework, or within a representative democratic framework, each of which attach different values and expectations to this issue. It is clear,

then, that by investigating this aspect and the other aspects of dimension III, an important link to dimensions I and II is established.

The definition of participation may be discussed in terms of who gets to participate in a pTA arrangement, what role participants play and what outcome is expected from participation.

It seems essential to distinguish between the values, assumptions and goals of the implementers of pTA arrangements and those participating in them. It may turn out that some social actor groups (representatives of special interest groups, for example) may not share the implementers' conception of participation, which could have repercussions for the course and outcome of a pTA arrangement. It can be assumed that as participants have a variety of reasons for wishing to discuss the issues under consideration in TA, they may also have differing values, assumptions and goals vis-à-vis the issue of participation. One could imagine a situation where potential participants abstain from a pTA arrangement because they cannot identify themselves within the implementers' aims and goals, thus putting in question the very aim of the arrangement. One possible criterion for discussing the definition of participation could be the degree to which a pTA arrangement is based on a pluralistic conception of participation, that is a conception that recognises the different meanings attached to participation by various social actor groups.

Rationale for pTA

What kinds of problems are suited for treatment in pTA? And what determines the choice of method in pTA? When is it necessary or valuable to set up a pTA arrangement?

Depending on the understanding of participation at work and the type of problem identified, the issue under consideration may be delimited to various degrees. It may be limited to a particular aspect, such as whether genetically modified food stuffs should be labelled or not; or, it may be defined in a broad way, allowing the consideration of different alternatives, such as what kind of plant-breeding methods should be promoted to ensure environmental sustainability.

A further distinction may be made between issues that aim at setting goals for future development and policy-making, such as the way in which human genetics should be advanced in the long term, and issues that aim at encouraging action to move from critical attitudes amongst participants vis-à-vis concrete issues, to constructive co-operation, such as in the case of the quest for sustainable urban living.

TA institutions or other TA organisers may have more or less explicit criteria for the evaluation of the need for and feasibility of pTA studies. Such criteria may, for example, touch upon questions of problem setting, such as:[2]

2 The presented criteria for problem analysis and choice of method is used by the Danish Board of Technology in evaluation of topics and choice of methods for the yearly work plan of the Board (Klüver, 2000).

- Is there a *problem* that needs to be solved? Are there actors that have a need for a public intervention?
- Is it *important* – economically, ecologically or in other specific viewpoints? Very important to few people or of a certain importance to many people?
- Is there a *technology* content? Is technology involved in the problem, or in problem solution?
- Is the *timing* right? Is it too early or too late to take up the problem? Is it possible to manage the timing by setting up pTA and thereby put the issue on the debate agenda?
- Is there an *addressee* for the outcomes of an activity? Someone who – with or against his will – needs to know?
- Is it a specific *task for TA* to make an activity? Because others avoid taking up the problem? Because the problem is cross-sectoral? Because a certain method is needed?

Likewise, it is possible that the implementers of pTA have a more or less explicit way of selection of pTA methods. Parameters in the selection may for example be:

- *Timing*. When will a project have to be finished? Is there a time pressure that determines the choice of method?
- *Target/resource groups*. Who are the actors that have a need for a pTA process, or which resource persons need to be taken into the process? Are there persons or groups that have to be involved, and does that determine the choice of method?
- *State of public debate*. Are the relevant communities (stakeholders; politicians; experts; the citizens) having a debate? Is debate enlightened, or does it suffer from lack of knowledge?
- *State of technology*. Is the technology in its infancy (in its vision phase), or mature (strongly institutionally embedded and controlled)? What kind of technological problem has to be solved (vision-making, goal-setting, regulation, reshaping)? Does the state of technology in society call for a reactive or a proactive approach?
- *Credibility*. What kind of credibility is needed in order to serve the addressees with input in which they have confidence? What method is able to deliver that credibility?
- *Problem*. What kind of problem is at stake? What sharpening of the scope, or what kind of comprehensiveness, is necessary?

No matter what kind of criteria or parameters are involved in the selection of topics and methods in pTA, they are an expression of the values, assumptions and goals of the pTA organisation and the society that surrounds it. It may serve as a hypothesis, that the consciousness of the pTA arranger about the criteria at work – the rationality – in initiating pTA, and the selection/shaping of the problem and method will play an important role in the outcome and ultimately in the impact of a pTA arrangement.

Impact (III.C)

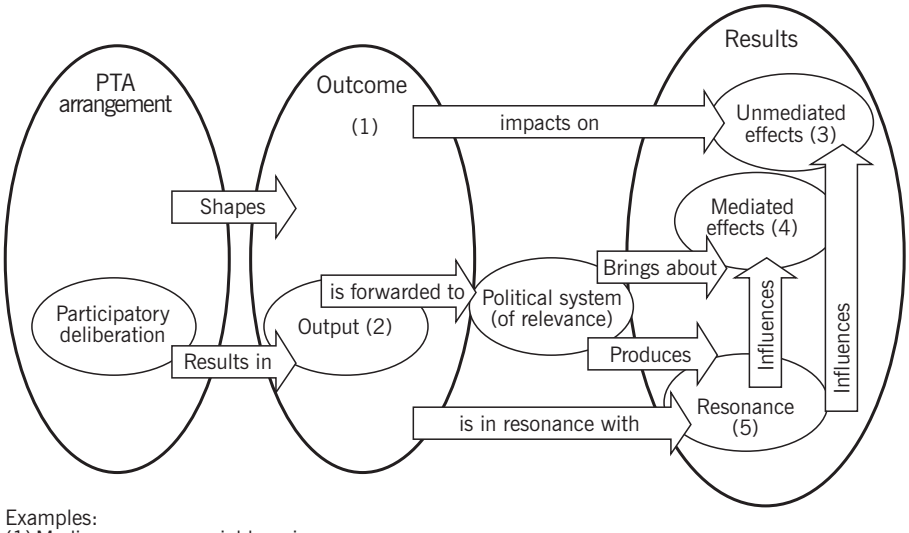
Put simply, the impact dimension is a function of the other dimensions combined. To assess the 'results' or 'impact' of a certain pTA arrangement it is useful to distinguish between the outcome of a pTA arrangement and its results.

Outcome

By 'outcome' both the process of participation, that is the discussion, deliberation and assessment that occurs in the course of the pTA arrangement, and the public recognition of that process, measured for example through the media coverage can be understood. An important part of the outcome is the 'physical' output. Regarding the output, the following characteristics seem important: first, the type of product – whether it is a written report, or an action plan, whether it is a vision, a recommendation, or a decision. Secondly, the 'authorship' of the product – whether it represents the assessment of the participants themselves, or the analysis and interpretation of the proceedings by the TA institution. Thirdly, the audience for which the product has been written – whether it is the participant groups (and their wider representations) themselves, politicians, the expert communities, the media, or the public at large.

Results

The results of a pTA arrangement (the effects of its output) may be direct or mediated through the relevant actors in the political system. For example, a report may be discussed widely in public debate and influence the course of this debate, or its recommendations may move a government agency to issue new guidelines with regards to the issue discussed. At the same time, the resonance to that arrangement may also be immeasurable. For example, a laboratory scientist may gain a better insight into the social dimension of his/her specialist area and thus engage more constructively in public debate. Clearly, these indirect and immeasurable impacts are difficult to evaluate. However, they may be as important as the measurable ones. For example, the long-term impacts of pTA on public debate and decision-making could be seen as the most important impact (for details, see Figure 3.5).



Examples:
(1) Media coverage; social learning
(2) Consensus report; press releases
(3) Awareness building; conflict management
(4) Change of policy/law; agenda setting; filter of policy alternatives
(5) Raising legitimacy; public understanding of science; public debate

Figure 3.5 *Model of the Impacts of Participatory TA*

Chapter 4

Research Protocol

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A Tool for the Empirical Analysis of Participatory Technology Assessment

One of the outcomes of the EUROPTA project was the 'research protocol', which was jointly developed for the purpose of undertaking empirical research. The protocol contains a set of questions and related instructions that guided the research. The structure of the protocol mirrors that of the analytical framework (Chapter 3). On the basis of the protocol, between two and four case studies were carried out in each of the six investigated national contexts. The case studies are summarised in Part III (Chapters 5–10).

The experience of using the research protocol was overall positive. The protocol helped to achieve coherence and comparability across the case studies. It was also a useful support tool during the field research (including interviews with various participants in pTA arrangements). As such, it could be used in future evaluations of pTA. It should be understood as a structured checklist for carrying out case study analyses. By following the research protocol, an insightful and reasonably complete picture of diverse pTA arrangements can be gained.

Societal Context (I)

Technology Innovation System

I.1 What was the issue at stake?

- *Describe* whether the focus was on: a specific artefact (for example, a car); a technological system (for example, traffic system); the interaction between different technological systems (such as train *versus* aviation system); or a wider techno-political issue.

- *Describe* the history of the development of the issue at stake.
- *Describe* the phase in development of the technology and related political issues: for example, R&D phase (technology shaping according to societal needs), commercial phase (regulation and fair allocation of benefits and risks), strongly institutionalised phase (was there a need for a system shift?).

I.2 What was the structure of the involved innovation systems?

- *Describe* the main actors and their interactions within the innovation system: for example, interactions between R&D institutes, firms, governmental bodies, interest groups, consumers.
- *Describe* the mechanisms within the innovation system that drove the development of the technology: for example, to what extent is the development technology-driven, demand-driven or policy-driven?
- *Describe* what the interests of the various actors within the innovation system were with respect to the technology.
- *Describe* in what way and to what extent the various actors in the innovation system were involved within the social debate around the technology.

Political System

I.3 Was there a political tradition of involving the public/citizens in decision-making processes?

- *Describe* how public authorities traditionally interacted with other actors: for example, consensual versus impositional, policy style of appeasement versus authoritative administration. (By 'public authorities', decision-makers of different branches of government are meant – executive, legislative, judiciary – at different (local, regional, national) levels).
- *Describe* the elements of direct/participatory democracy within the political system at the local, regional and national levels: for example, public consultation (citizens' boards, formal mechanisms (referenda, initiatives).

I.4 Was there a tradition of involving the public/citizens in policy-making processes in 'technology-related issues'?

- *Describe* whether corporatist arrangements prevailed (policy decisions made in co-operation with organised interest groups and experts), or involvement of the public and/or social movements was common.
- *Describe* to what extent pTA has been carried out and how this has impacted social debate and policy-making.

I.5 What was the role of public authorities with respect to the decision-making on the technology involved?

- *Describe* the public authorities' focus with respect to stimulating and regulating the technology: for example, R&D policy, business policy,

implementation policy, use or impacts, mitigating side effects.
- *Describe* whether the regulatory instruments of dealing with the technology were already in place: for example, safety or health regulations, formal approval, right for citizens and interest groups to appeal.
- *Describe* the way in which the public authorities co-operated with scientific experts and industry.

I.6 What was the role of public authorities with respect to the social debate/controversy?

- *Describe* in what way a public authority was involved in the social debate: for example, did it ignore the social debate, did it publicly support activities to promote the social debate, did it subsidise activities to support the social debate, did it launch an information campaign to moderate the social debate.
- *Describe* the different actors' demands for governmental action: for example, was there a strong public demand for regulating the technology at stake, were there demands made of industry for a good climate for innovation?
- *Describe* whether the social debate was mirrored at the political level, in other words, describe whether the arguments used in the political arena were similar to the arguments used in the social debate.

Technology Controversy and Public Sphere

I.7 About what was the social debate/controversy around the issue at stake (in the pTA arrangement)?

- *Describe* the general public attitude towards scientific and technological progress at the time the pTA arrangement was held: for example, societal climate characterised by mistrust versus faith in progress.
- *Describe* the history of the social debate/controversy: main events, phases and issues, role of different actors (individuals, groups or organisations) and their influence on the social debate.
- *Describe* the various characteristics of the issue at stake: for example, uncertainty of knowledge, conflicting values, manifestation of various interests.
- *Describe* what was at the centre of the public controversy/debate.

I.8 Was there public awareness on the issue at stake at the time of the pTA arrangement?

- *Describe* the extent of the discourse on the societal impacts of the technology at stake: for example, trend-watchers, opinion makers, media coverage, initiatives of social interest groups, grassroots movements (protest activities), broad public.

I.9 Were demands for more participation/democracy expressed in the social debate?

- *Describe* demands relating to criticism on experts and/or decision-makers (trust) and relating to the decision-making process (decision competence).

I.10 Was the public controversy/debate politicised in a way that pro and con positions could be identified according to political party positions; or did it cut across party positions?

Institutional Context (II)

Institutional Setting

II.1 What was the formal setting of the (TA) organisation responsible for organising the pTA arrangement?

- *Describe* links to, for example, parliament, government agencies, committee(s), academic institutions, interest organisations (both public and private).
- *Describe* the formal role of the (TA) organisation in the political decision-making process on science and technology.

II.2 What was the external perception of the (TA) organisation?

- *Describe* the standing of the (TA) organisation relating to political authorities and parties, the general public, social movements, industry, the scientific/expert community.
- *Describe* the status of the (TA) organisation's output(s) relating to social debate and public policy and decision-making (to clarify 'status': use 'reputation' and 'renommee' and distinguish between formal and effectual status).

Structures and Procedures

II.3 What were the financial and human resources available to the (TA) organisation?

- *Describe* the financial and human resources of the (TA) organisation; in particular, the number of staff involved in the pTA arrangement.
- *Describe* who funded the (TA) organisation.

II.4 How were TA projects selected and designed?

- *Describe* to what extent the (TA) organisation was independent in its choice of issues and methods.

- *Describe* the characteristics of project selection and design. (How was it done and who was involved in selecting issues and methods?)
- *Describe* whether the institution uses different sets of pTA, in order to match different timing.

TA Approach

II.5 Did pTA constitute an integral part of the organisation's understanding of TA?

- *Describe* whether the formal mission of the (TA) organisation hinted at, or called for, participation within TA arrangements.
- *Describe* the organisation's understanding of TA in terms of the function of TA: for example, stimulating social debate, policy advice.
- *Describe* whether the organisation had experience with involving the public or stakeholders in the process of producing expert analysis of policy problems.
- *Describe* whether the organisation had experience with forms of TA in which TA experts help citizens or stakeholders to collect inputs and transform them into advice.
- *Describe* whether the organisation had experience with forms of TA in which TA experts play a mediating role between policy-makers and stakeholders or citizens.

PTA Arrangement (III)

III.A Set-up and Process

Design

III.A.1 What were the overall characteristics of the pTA arrangement?

- *Describe* the general set-up (parts and techniques) of the pTA arrangement: for example, type of workshop, moderation techniques, groups discussion.
- *Describe* the role of participation within the pTA arrangement (was participation a fundamental part of it or just a little amendment?).
- *Describe* when (for example, one-time event, series of events or permanent endeavour) and where (physical environment in which) participants met.
- *Describe* what kind of timing demands the pTA method had to live up to: for example the pTA had to be finished before the political issue at stake would be debated within Parliament.
- *Describe* the (formal and informal) role of the advisory committee (if there was one) within the pTA arrangement.

- *Describe* the kind of information inputs (for example, research papers, scenarios, newspaper articles, outside expert presentations) the organisers collected or generated to feed into the pTA process at what moments.

Participants

III.A.2 What kind of and how many participants were involved at what times during the pTA arrangement?

- *Describe* how many of which type of participants were involved in the pTA arrangement and why this choice was made.
- *Describe* in which phases of the pTA arrangement these participants were involved.

III.A.3 How were participants selected?

- *Describe* the kind of selection principles that were used: for example, representativity versus balance.
- *Describe* how participants were selected; for example, random selection, volunteering, categorical self-selection, selection through networking, co-nomination, balancing of interests, mixed composition based on demographic parameters.
- *Describe* for what reasons participants were selected in this way and how biases were avoided.

III.A.4 Which participants took what kind of decisions?

- *Describe* which participants played either a consultative or decisive role in the selection of other participants.
- *Describe* which participants played either a consultative or decisive role in agenda setting.
- *Describe* the kind of information inputs (for example, research papers, scenarios, newspaper articles, outside expert presentations) the participants collected or generated to feed into the pTA process at particular moments.
- *Describe* which participants initiated new information gathering or new investigations.

Interactions

III.A.5 What were the rules of communication of the pTA arrangement?

- *Describe* who was allowed to speak and when during the pTA process.
- *Describe* who could address whom during the pTA process.
- *Describe* to what extent the various participants had equal opportunities to express themselves and had equal access to information within the pTA arrangement.

III.A.6 How did the process of communication develop during the pTA arrangement?

- *Describe* what kind of interaction was prevalent during the pTA arrangement: for example, bargaining on interests, arguing on cognitive claims, looking for win-win situations.
- *Describe* what kind of apparent strategies the various participants had in order to achieve their objectives.
- *Describe* what kind of conflicts on agenda, on knowledge claims, on values and interests, and on rules of the pTA procedure did show up during the pTA arrangement.

Unintended Events

III.A.7 What kind of unintended events occurred during the pTA arrangement and how did they affect the pTA process?

- *Describe* the unintended internal events that happened: for example, some participants left the pTA, parallel campaigns by actors, boycott by interest groups, emergency design.
- *Describe* the unintended external events that took place: for example, change of government, press campaigns by non-involved stakeholders, new technological development.
- *Describe* how these internal and external events influenced the pTA process.

III.B Values, Assumptions and Goals

Problem Definition

III.B.1 How did the various involved actors (implementers, participants, members of a steering committee, board members, advisors, researchers, project team members, clients) define the issue at stake?

- *Describe* what exactly the implementers, participants and other involved actors saw as the issue at stake in a given situation (describe what is going on in the eyes of these actors).
- *Describe* why the implementers, participants and other involved actors defined the problem as they did (describe on what kind of experiences or world views their problem perception is based).
- *Describe* how the implementers, participants and other involved actors estimated the costs, benefits and side effects of the various solutions to the problem as they saw it.

III.B.2 How did the implementers, participants and other involved actors (for example, members of the steering committee, board members, advisors, researchers, project team members, client) want the problem to be treated within the pTA?

- *Describe* whether the implementers, participants and other involved actors promoted a more focused or a more synoptic treatment of problem scope.
- *Describe* whether the implementers, participants and other involved actors promoted a more simplifying or a more elaborating treatment of the problem.
- *Describe* whether and in what way the implementers, participants and other involved actors paid attention to the political and/or institutional (network) context of the problem.
- *Describe* what kind of demands the implementers, participants and other involved actors expressed with respect to the problem at stake: for example, demand for more information.
- *Describe* whether the implementers, participants, and other involved actors promoted a more solution-driven (problem-solving) approach or a more problem-driven (problem-finding) approach.
- *Describe* what kind of demands the various actors expressed with respect to the problem at stake: for example, demands for more information (need for studies, surveys), demands for clearer objectives (need for clarifying aims and values) and for more co-ordination (need for planning, negotiation, interaction).
- *Describe* whether the various actors paid attention to the political and/or institutional context of the problem.

Definition of Participation

III.B.3 What kind of participatory processes did the implementers and other social actors expect within the pTA arrangement?

- *Describe* how various actors viewed their own level of participation and that of other actors within the pTA arrangement.
- *Describe* in what stages of the pTA arrangement the various actors expected themselves and other actors to have a say.

III.B.4 Why did the various actors engage themselves in the pTA arrangement?

- *Describe* the perspective of the implementer and other actors on the pTA arrangement.
- *Describe* the expectations/goals various actors had with the pTA arrangement: for example, to develop new visions, clarify policy objectives, develop policy options, construct strategies, test action.

Rationale for pTA

III.B.5 What were the main reasons for selecting and setting up this pTA arrangement?

- *Describe* why pTA was an option, and for what reason(s) the organizers chose to set up a pTA arrangement: for example, for reasons of democracy or legitimacy, to induce a learning process, because knowledge was contested or expert knowledge was thought not to be enough.
- *Describe* for what aim the organisers chose this particular pTA method: for example, to generate information, to clarify the various viewpoints, to attract attention to alternative ideas, to visualise various important aspects, mediation, to give critical or creative solutions a voice, to increase participation, to stimulate and organise interaction between various stakeholders.
- *Describe* by whom and by which procedures the pTA project was launched: for example, board or staff of the (TA) organisation, the political arena.

III.C Impact

Outcome/Output

III.C.1 What products did the pTA arrangement produce?

- *Describe* the type of product(s) that were generated in the different phases of the pTA arrangement: for example, written/oral report, action plan, vision, recommendation, no formal product, changed problem perception.
- *Describe* the producer of the final product: for example, assessment by participants themselves; analysis and interpretation of the proceedings by the TA institute.
- *Describe* the intended audience of the final product: for example, participant groups (and their wider representations), politicians, expert communities, media, public at large.
- *Describe* the review process of the final product: for example, internal review process within the TA organisation, some form of peer review.
- *Describe* why and when during the pTA arrangement texts were transformed: for example, in order to serve the participants' needs, in order to translate the results of the pTA arrangement for politicians.
- *Describe* the type of problems that were encountered with respect to the (final) product: for example, textual transformation, language, not all-encompassing, reliability of scientific facts.

III.C.2 How did the communication with the outside world take place?

- *Describe* to what extent the media were associated with the pTA arrangement, or in other words, describe whether the media were an in-built characteristic of the pTA process.

- *Describe* what kind of communication strategy and activities or 'events' with the outside world took place: for example, alongside the process via newsletter, Internet site, end-of-pipe event (for example, the audience at the last day of a consensus conference, a special conference to disseminate the results of the pTA arrangement).

III.C.3 How was the pTA arrangement covered in the media?

- *Describe* the media coverage in various types of media (radio, TV, Internet, web sites, newspapers, periodicals, public documents) in a time perspective (before, during, shortly after, and longer (more than one month) after the pTA arrangement).
- *Describe* the general focus of the media coverage: for example, was the participatory element touched upon in any of the media? Did the media picture the pTA arrangement as a contribution to the social debate? Did the media discuss the organiser's role in the social debate/controversy?

Results

III.C.4 How were the pTA arrangement and the policy-making process related?

- *Describe* the formal link between the pTA arrangement and the political decision-making process.
- *Describe* the informal relationship between the pTA arrangement and the political decision-making process.
- *Describe* the relationship between the pTA arrangement and the societal and political processes.

III.C.5 What was the impact of the pTA arrangement?

- *Describe* whether, as a consequence of the pTA arrangement, there has been any change in legislation, funding, regulation, or any other concrete consequence to any authoritative public decision.
- *Describe* whether, as a consequence of the pTA arrangement, there has been any change in market conditions, consumer behaviour or any other concrete consequence in the economic sphere.
- *Describe* whether, as a consequence of the pTA arrangement, there has been any change in relevant vocabularies, agendas, problem statements or any other political aspect regarding the substance of the policy issue discussed, or the process or role of the pTA arrangement.
- *Describe* whether, as a consequence of the pTA arrangement, there has been any learning by the various actors regarding the substance of the policy issue discussed, the process or role of the pTA arrangement, or the participants' own knowledge, role, organisation, civic engagement.
- *Describe* what the institution learned from the arrangement.

Part III

Case Studies

Chapter 5

Austria: Methodological Innovations from a Latecomer

Case studies
- Ozone Consensus Conference 1997 (Ozone AU)
- Traffic Forum Salzburg 1995–6 (Traffic Forum AU)
- Austrian Technology Delphi 1996–8 (Delphi AU)

Petra Grabner, Walter Peissl and Helge Torgersen[1]

Introduction

Although Austria has not seen many participatory technology assessment (pTA) arrangements, their own arrangements took on various shapes. The Austrian contribution to this volume presents three very different arrangements: a consensus conference, a citizens' panel type of arrangement and a participatory variation of a Delphi forecast. The consensus conference, on atmospheric ozone, was an experiment that had to cope with huge time and resource problems, and compromises lead to severe impediments. The Traffic Forum Salzburg, scheduled to develop a master plan for local traffic, arrived at solutions but, in the long run, failed to deeply influence policy-making. The move of the Technology Delphi to take on board stakeholders was regarded as important by policy-makers; however, technology policy is not a field that has a long tradition in Austria, so all three arrangements had their own specific problems.

Before we describe them in more detail, we have to regard the environment in which pTA would have to find its place; i.e. a look at the political culture reveals two elements impeding as well as facilitating a pTA approach: expert dependency and top-down orientation. Until recently, Austrian political culture reflected historical experiences such as the tradition of paternalistic 'revolutions from above'. Austria is extremely legalistic – most government

1 Petra Grabner was responsible for the traffic forum Salzburg case study. Helge Torgersen and Walter Peissl co-authored the case study on the Austrian Technology Delphi. The ozone consensus conference analysis was written by Helge Torgersen.

decisions have to be laws. Nevertheless, the Austrian bureaucracy is much more influential than the constitution emphasising popular sovereignty outlines, and it is a factor of continuity that promotes a culture of government by decree. The relationship between the public and politics is often clientelist, leading to little public accountability and responsiveness. The proportional system granted each of the two governing parties of the former grand coalition (Social Democrats and conservative People's Party) a proportion of public jobs roughly equal to their share of the vote. Consequently, both big parties and their organisations dominated political and even everyday life. This all-embracing power has faded now.

Although rarely applied, there are three instruments of direct democracy. A referendum is required, e.g., for a 'total revision' of the constitution. The people's initiative is a way of putting a bill before Parliament and has to be supported by at least 100,000 voters. Apart from being debated in Parliament, there is no further obligation. The instrument was used several times by political parties to promote their policies. Finally, in a consultative referendum, Parliament may ask the people for their opinion in matters of principal importance.

The second prominent feature of the Austrian political system is concordance and the neo-corporatist mode of decision-making called 'social partnership'. Developed in the post-war period, the system served to prevent clashes of interest and to guarantee social peace. It implies that decisions can only be made unanimously after the essential political and interest groupings have been heard in protracted negotiations behind closed doors. As a consequence, few highly concentrated, centrally organised and quasi-monopolistic interest groups are involved in political decision-making. Until the 1980s, their influence was extended, but growing criticism has led to serious legitimacy problems. Recent attempts to extend the system to issues of new social movements and to involve NGOs more or less failed.

In general, there was and is little public debate about technology. Although technical progress is generally welcomed, when it comes to certain technologies, resistance may arise. The first heavy debate on a technology – nuclear power – ended with its rejection in a referendum in 1978. In several later instances, mostly hydro-power plants, the established system of social partnership came heavily under attack from environmental activists. More recently, after public debates about BSE and genetically modified organisms, food became a salient issue. In such cases, government mostly reacted by retreating flexibly, trying to co-opt temporarily interest groups in order to calm down unrest.

The Ozone Consensus Conference (Ozone AU)

Tropospheric ozone is an irritant gas formed under the influence of sunlight during summer days. Scientific (experimental) evidence for dose-dependent harm is difficult to establish, but effects are likely. The problem is how to

avoid the formation of catalysing precursors arising mainly from combustion of fossil fuels. Energy production and traffic are the main sources, and agriculture contributes by several processes. Precursors may accumulate over time and get transported by wind over long distances. Trans-boundary pollution renders local reduction strategies insufficient. Since national regulation would not reduce trans-boundary sources it is a European problem, too.

In the beginning of the 1990s, a strategy was necessary in Austria to reduce the overall level of precursor substances. Since the problem mainly related to fossil fuel use, no societal actor remained unaffected. A fair allocation of burdens had to be devised and government wanted to show activity. In the general neo-corporatist style of the Austrian 'social partnership', representatives from trade unions, various chambers, the industrialists' association as well as environmental NGOs, automotive asociations, etc. got involved in negotiations. Solutions proposed varied according to the different clienteles' interests.

Political actors agreed to develop a general plan and to hold a conference in 1994, which never took place though, as the Federal Ministry of Environment was reluctant to engage in a debate. The Eastern *Länder* (counties) of Vienna, Lower Austria and Burgenland, most hit by the problem, sought to move things and to put pressure on the Federal Ministry. In the meantime, alarming NGO reports on ozone toxicity were defeated by counter-expertise stating that harm could not be established. The Federal Ministry remained inactive except for installing a telephone hotline.

The issue became a major 'shocker' over the summer, depending on weather conditions and whether or not other issues could absorb the media's interest. The problem added to a general unease about the negative impacts of car use. However, driving prohibitions to make polluters responsible were deemed inappropriate since they cut into personal behaviour. Car drivers' associations as well as the transport sector protested. Politicians were reluctant to propose unpopular restrictions on car use or energy production.

A consensus conference appeared to be a way out. In an experiment to see how far a regulation could go without loosing public support, it could indicate compromises beyond the usual neo-corporatist negotiations. It could also serve as a legitimation for unpopular measures. Since, so far, no consensus conference had been held in Austria, public and media interest was supposed to be high, adding to the profile of the event. Nevertheless, the outcome would be non-binding, so there would be perhaps public pressure but no legal obligation.

The pTA arrangement was to follow closely the Danish model, where a lay panel, after being instructed by experts during two or three weekend workshops, holds a hearing and finally decides over the issue at stake, usually in a two-day session. The organisers contacted the Danish Board of Technology and an expert from Britain for advice. It soon became apparent that they had to adapt the model for political necessities. For example, instead of an independent advisory board, there was a project team of *Länder* representatives that set the agenda and chose the participants. Other hurdles were

time and budget constraints: among other adaptations, there were only two preparatory weekends and the final session had to take place on a single day. Most importantly, the lay panel consisted of 15 young people between 16 and 28 years only. The reason for this was lack of money, as young people supposedly have more time available without having to be reimbursed, and can be reached more easily through pertinent organisations and the Internet, without running costly newspaper advertisements.

The conference was carried out by the environmental protection agency of the City of Vienna (WUA), together with similar agencies of two other Eastern *Länder*. WUA's tasks usually were to review new regulations, to represent environmental interests in trials, to receive complaints from citizens and to prepare reports on emerging environmental issues, including new methods of conflict resolution. The consensus conference model appeared interesting to them for future application.

WUA's staff is 10 persons, and they had never before engaged in a TA activity. Since the consensus conference was one of several activities at that time, institutional constraints were heavy. Additionally, work estimates turned out to be too optimistic. Funding was for only one person per year and ATS 500,000 (ca. Euro 36,000) for overheads. To help out, a professor of environmental law of the Vienna Technical University provided free expertise.

Time was sparse since the report had to be available before summer when ozone accumulation would again be publicly discussed. Preparations started in January 1997 with a press conference announcing the consensus conference to come. From March to April, the lay panel and the experts were nominated. Two preparatory workshops were held in April and May. After an expert hearing, the two-day consensus conference concluded on 23 June with a press conference. With the final report appearing after three months, the project took less than a year.

In order to attract young people to participate in the lay panel, an information sheet was distributed to schools, universities, youth organisations and via mailboxes and teletext. Future participants sent in applications and were selected according to demographics and affiliation with stakeholder groups. However, it turned out to be difficult to attract a sufficient number of volunteers, so the choice was very restricted.

In an explanatory weekend, the lay panel were instructed about the problem at stake and the set-up of the conference. This included terminology, group dynamics and argumentation strategies in a face-to-face situation with experts, through co-operation and bargaining simulation plays. Since the organisers tried all means to avoid influencing the lay panel, no experts were admitted at this stage. Instead, information came from scientific reports, press clippings and stakeholders' declarations, to be read between the workshops, which not all members achieved. A 'master question' was introcuced: 'Which demands are there for our society considering the prognoses on ozone accumulation, the reduction aims and the measures proposed; and what can we do in order to meet the demands?' The wording was clumsy and difficult for the panel to deal with.

The second workshop prepared for the hearing and consensus finding. The lay panel decided to do without mediation in seeking a consensus at the final session, and to omit minority votes. For documentation, the discussions during the weekends were minuted.

The expert hearing before the conference was open to the public. Among the experts were scientists, politicians, stakeholders, environmental NGOs and a journalist. After short statements, they engaged in a debate with each other and answered the panel's questions. However, there were few inputs from the lay panel. Expert statements followed the expected patterns: they adressed mostly their colleagues, whom they had met in many neo-corporatist negotiations; they hardly transgressed their field of expertise or stakeholders' roles. Social control was strong in the face of their peers, the media and the public.

Some experts had the usual language problems vis-à-vis lay people. To the lay panel, it appeared as if there were no policy options at all and consequently the lay people became frustrated. This increased their lack of trust in experts and politicians who appeared not to *want* to find solutions.

Consensus finding occurred behind closed doors and, contrary to the intentions and to the concern of the organisers, without a facilitator – the young panelists were very sensitive to any attempts to influence them. Since they decided to approach consensus by all means, pressure was considerable. Group dynamics, however, appeared unfavourable to a consensus.

The final report, as presented in a press conference, did not provide clear options; rather, it made politics responsible to find solutions. It pointed at the panel's fundamental distrust of politicians and experts, and called for citizens' responsibility in a general way. Organisers, experts and politicians had expected to see options as a basis for further political measures; the lay panel, however, avoided proposing concrete measures. The report thus did not meet the expectations in terms of conciseness and practicality for problem solution, and was deemed useless by politicians. It had no political impact, despite politicians' initial guarantee of its implementation. However, the lay panel had not realised this offer since the organisers had not wanted to emphasise it in order not to jeopardise an 'authentic' outcome. After the conference, some panel members regretted the lost opportunity.

The media response was disparate: the first press conference elicited widespread newspaper coverage. In comparison, media reports of the expert hearing were scarce. The final press conference produced a split response: some newspaper reports were friendly, but distant. Others pointed at shortcomings due to the complexity of the issue. Another problem was that at that time awareness was low: since weather conditions were bad, no excess ozone had developed. The problem was not in the media, and coverage was less than anticipated.

The WUA had a later hearing with the Vienna Parliament's environmental committee, but to no avail. The issue had mostly disappeared from the political agenda. Admittedly, the organisers have said they will not engage in another consensus conference since they think the outcome will not match the

input. In general, the first consensus conference in Austria, on the ozone problem, was deemed a failure.

Traffic Forum Salzburg (Traffic Forum AU)

During the post-war period, massive investments in the enlargement of the road network were undertaken. Traffic planning was basically reduced to road planning, whereas the public transport system was comparatively marginalized. This development was accompanied by a trend of separation between private residence and work place.

Consequently, and in particular since the 1970s, traffic problems in and around the city of Salzburg (with an area of about 66 square kilometers and more than 145,000 inhabitants) increased significantly. The problem of increasing commuter figures is intensified by the geographical situation and tourism. Until the mid-1990s, motorisation had reached 434 cars/person (i.e. the European average). Since 1971, the number of commuters has doubled, from 210,000 to 420,000. Correspondingly, traffic load intensified: between 1982 and 1994, it increased by 50 per cent, and on weekdays, 184,000 vehicles passed the city's boundaries, one-third of them private cars.

During the late 1980s and early 1990s, political parties tried to acquire status on this field. Since 1992, a complete deadlock has evolved due to long-lasting controversies between politics, several traffic and/or citizens' action committees and business interests. By the mid-1990s, massive political conflicts and social debate were accompanied by high public awareness and significant media coverage. Back in 1986, a party political agreement set up the target to develop a traffic policy concept. However, the competent authority, the responsible municipal department, failed. Studies forecasting further dramatic increase of traffic load until 2010 made new attempts necessary, in order to calm down the debate. Both the politician responsible, the vice-mayor of town (representing the local Green Party), and the municipal Department for Traffic Planning had high hopes in a participatory Traffic Forum, which they mainly initiated in order to regain capacity to act.

The Forum as a model of citizens' participation was quite unusual to traditional political patterns. It was adapted from a similar arrangement in Heidelberg, Germany. The competent authorities commissioned the mediator of the Heidelberg Forum, a German town-planner and municipal consultant. However, human and financial resources were restricted.

The Salzburg Traffic Forum was designed as a mediated model of public participation. The main objective was re-establishing the dialogue between different actors. Apart from providing for a fair and transparent discursive climate, the design of the Forum aimed at participation and integration of all relevant interests rather than at representation of particular groups and organisations. Interests were formulated according to the idea of a common weal. As a second goal, a process of information and agreement was to be developed in order to remove prejudices and misunderstandings between the actors involved.

The concrete tasks were:

1 elaboration of a catalogue of urgent traffic problems, which should be resolved immediately;
2 collecting proposals for measures to be undertaken in a short time perspective and without high costs;
3 the main goal of the Traffic Forum was the formulation of a new traffic model for the city of Salzburg in a written report, summarising, ideally, undisputed goals.

The report should be presented to a broader public, to the administration and to politics in order to serve as recommendations for future decisions on traffic policy. Ideally, the municipal council would officially adopt the results as a new strategy for traffic policy in Salzburg.

The Salzburg Traffic Forum consisted of two different fora: the so-called inner circle was designed after a representative public participation model. About 20 citizens participated as representatives of all relevant organised interests (citizens' action groups, social organisations, environmental groups, public transport, employees, employers, representatives of health interests etc.). Hence, the selective criterion was not the membership in a particular association but the representation of a particular interest. Although interests were pre-selected in the preparatory work by civil servants, the first step towards the establishment of the Traffic Forum was an open discussion session. Groups, associations and organisations were to be classed according to concrete interests pre-formulated by the moderation team. In case of coverage of a specific interest by several organisations, the respective groups were supposed to agree internally on one competent representative and on a way to deliver informations and make decisions.

The inner circle was planned to be not only the arena of public participation but also the main working place. Results should not be reached via majority rule but by consensus through negotiation. In cases where the general consensus was unacceptable for one or other representative, their deviant opinion had to be noted in the protocol.

The outer circle, in contrast, served as a representation platform for politicians and civil servants, external experts and the inner circle's participants' deputies. All members of the outer circle were, as a general rule, asked to restrict their active role as far as possible. The main function of the outer circle was mainly to observe the discussion process. Second, members were asked to provide inputs upon request, for instance to give additional information and expertise and to help to clear misunderstandings.

As an internal clearing-agency for the Traffic Forum, a Project Group Traffic was established, consisting of the moderator, three elected members of the inner circle (representing the main interests: business, environment and social issues) and civil servants from the Department for Traffic Planning responsible for the Forum. Apart from the preparatory work for the sessions, the Project Group was also concerned with occasional press information as

the regular meetings were not open to the broader public or to the media. Starting in February 1995, 12 sessions were scheduled running up to December 1995. At a later date, the Traffic Forum's work was extended until March 1996.

The moderator's/mediator's task was the design and implementation of the model. However, within the boundaries of the procedural framework, the contents of work was the participants' responsibility. Hence the moderator's tasks were mainly restricted to the creation of a fair and rational discussion climate, which would not allow for personal insults, and to providing for a working style oriented towards argumentative transparency and a decision-making process based on dialogue. The moderator chaired the meetings but had no vote. He was supported by a co-moderator, who is a collaborator of the 'Future Library' in Salzburg focusing on future studies. His role was that of a deputy and local addressee in the sense of mediating between the Traffic Forum participants and the main moderator as well as among individual members of the Forum. Additional meetings were to be chaired by him (due to the restricted financial resources), and his institution was supposed to collect the necessary information.

From the first session on it became clear that the participants did not fully accept the concept of the Traffic Forum or some of the procedural techniques. There were two main reasons: the idea of interest representation ran counter to the traditional Austrian political pattern, and the neutrality of the moderation team was doubted. Consequently, the nomination of the inner circle members proved to be the first hurdle and was not fully realised according to the initial model. Considerable weakness of the moderation team resulted in significant changes. In particular, the vice-mayor and civil servants played a much bigger role than originally conceived, which laid the ground for conflicts during the whole Forum. Significant changes from the agreed procedures were made in several meetings as they seemed to be the only possible solution for the time being.

The participants' strategies turned out to be the most important determinants of behaviour. In contrast, acting according to the Forum's guiding ideas proved to be strategically flawed. During the whole discussion process, representatives of business interests managed to uphold an unanimous position and thus exceeded significant power within the inner circle. Representatives of 'soft mobility' often weakened their positions in order to compromise, since social interests turned out to be too ill-defined to be well represented. Only one of the participants of this group played an integrative and constructive role.

After considerable delays and temporary conflicts, a report was written. However, since ultimately the municipal council did not adopt the concept as a new traffic policy strategy for the city of Salzburg, the Forum was a failure in terms of practical political output. This impression nevertheless contrasted with the success in terms of improvement of the discussion climate. In general, ever since the Forum took place, traffic political debates have been significantly less emotional and more constructive. Media interest and public

awareness, on the other hand, have decreased as well. Participants of the Forum retrospectively evaluated the arrangement as an interesting model. Still, similar arenas of public participation have not yet materialised in Salzburg.

Technology Delphi Austria (Delphi AU)

In Austria, as compared with other western European countries, the need for an explicit technology policy was considered to be less urgent for a long time. Rather, Austria remained dependent on technology input from abroad. The reason for this was that the political and economic shocks of the first half of this century – the First World War, the end of the Austro–Hungarian empire, the Great Depression, the Second World War – had left Austria as an outdated industrial country with a serious technology and income gap. By way of importing foreign technology, this gap was successfully closed during the 1960s; however, in such a situation, it was neither useful nor necessary to develop autonomously a National System of Innovation (NSI). By the mid-1970s, Austria had managed to catch up with the leading industrial countries, and it became necessary to develop domestic technologies rather than to only import foreign ones. In order to master this transition, a policy change was highly necessary, but proved to be difficult.

As Austria still specialises in a broad range of traditional medium-technology goods – even if of highest quality – an Austrian NSI has to focus on three aspects:

1 creating the framework for successful independent basic innovations;
2 upgrading existing technology in general by incremental innovations; and
3 concentrating on a limited number of innovative high-tech market segments ('niches'), in which basic Austrian innovations and, consequently, Austrian dominance would appear possible.

Since 1980/81 there have been endeavours to catch up on the research backlog in terms of modernisation, but these suffered from conceptual and strategic deficits. Over the past couple of years, several more concrete steps have been taken: a government technology concept was designed and adopted after a year-long delay, and a number of priority programmes in several high-technology fields helped to induce academia and companies to co-operate more closely. The problem, however, was the selection of priority areas. Concentration on a top-down approach proved ever less promising. Inspired by several foreign examples, and in order to determine Austria's current position and to flag the way to proceed, the Ministry of Science and Traffic decided to commission a foresight exercise in the form of a Delphi study as an input for this difficult task. A Delphi study is an elaborate survey of experts, by way of a questionnaire, about their view on future developments. In a second round, the results are presented, in an anomymised form, to the first

round of experts so that they are confronted with the opinions of their peers. The rationale is to reduce extreme opinions and to focus on a broad consensus.

This case study deals with the Austrian Foresight exercise of 1997, executed by the Institute of Technology Assessment (ITA). In order to meet Austria's special needs as a small economy, the overall goal was, rather than to detect emerging technologies in general, to identify those innovation potentials where Austria might have the opportunity to achieve leadership within the next 15 years.

In order to give the most complete picture possible, a Delphi on future technology developments was combined with a similarly shaped Delphi on societal and cultural changes (in what follows, we will focus on the technology part only). Another innovation, especially for the Technology Delphi, was a deliberately participatory approach, also taking into account the demand side. This was achieved by setting up panels of representatives from industry, academia, administration and user groups who designed the survey questionnaires and drew the conclusions from the results. The Technology Delphi was designed and executed in five steps:

step 1 (May to August 1996) conceptual work, setting up the steering committee.
step 2 (September 1996 to January 1997) parts one to seven (from the below list) and selection of problem/technology areas.
step 3 (February to May 1997) selection of panel members, panel work, design, test and printing of questionnaire.
step 4 (June to December 1997) Delphi survey (two rounds) and global analysis by ITA, report 1.
step 5 (January to March 1998) detailed analysis by ITA and recommendations by the panels, reports 2 and 3.

In order to get the desired networking going, participation on different levels and in various forms was a part of the process designed by ITA. Although many people were involved in the preparatory work (phase 2: survey on potential technology fields and co-nomination of peers among 350 high-level experts; survey on knowledge of and attitudes towards technologies among 1,000 consumers) this step cannot be called participatory in a narrow sense. Truly active involvement, however, took place in the Delphi's 'core element', the panels' work in phases 3 to 5. As an integrative part of the idea, an additional phase 6 (implementation) with a focus on participation, too, was evisaged but not realised. The Technology Delphi process consisted of eight elements:

1 analysis of Delphi studies from other countries;
2 scenario-building of international technology developments;
3 co-nomination analysis of peer experts (350 interviewees);
4 expert survey (350 interviewees);
5 analysis of the Austrian R&D system's strengths and weaknesses;

6 consumer survey (1,000 interviewees);
7 media and trend analysis;
8 Delphi survey (3,700/1,100).

Elements 1–7 were performed in preparation of the Delphi Survey as the core element. In order to overcome some problems that other technology foresight studies had encountered, ITA pursued a decentralised, bottom-up approach that was strictly linked to Austria's needs. The time horizon was set to 15 years.

The co-nomination analysis rendered the names of most of the relevant domestic experts in the selected fields. To make the decentralised approach work, seven panels (one for each selected problem /technology-area[2]) were set up. The panels were supposed to design the questionnaire for the Delphi survey and, after the second round, to formulate recommendations derived from the survey results. Panel members were selected from business, academia, governmental bodies and user group representatives. Because of the demand side and problem-solving orientation of the Austrian Delphi, the organisers decided that at least one-third of the members of each panel should be social scientists, civil servants and user representatives rather than technical experts. The seven panels (14 to 23 persons each, 128 in total) met four times for a half-day moderated workshop each at the Austrian Academy of Sciences in Vienna. The panel members participated without being reimbursed, except for travel expenses.

As a starting point, the ITA staff had prepared reports for each area with a scenario of the international technology development. Each meeting was moderated by two members of the ITA staff, who also prepared the minutes providing a full graphical and written 'picture' of what had happened during the meeting. The minutes were sent out to the panel members, together with the reminder for the next meeting. By means of a strictly targeted procedure using visualisation and moderation tools, the panels succeeded in finding about 40 possible innovations within each area and 76 to 172 (849 in total) policy proposals that were supposed to support the pertaining development. These findings provided the basis for the questionnaire. The ITA staff edited the final version only slightly with respect to the wording. While the overall responsibility for the process and its parts remained with ITA, the panel members received the final version for approval before it went to print. After the two rounds of the Delphi survey, each panel was again invited for a full-day meeting in order to draw conclusions and formulate recommendations.

The whole process had to be performed under considerable time pressure because the Ministry of Science and Transport (as the financing institution) wanted to present the results during the first quarter of 1998. From the first brainstorming in the steering committee in May 1996 (pre-contractual phase)

2 Production and processing of organic food, new forms of housing and environmentally sound construction, lifelong learning, medical technology and supportive technologies for the elderly, cleaner production and sustainable development, mobility and transport, and tailor-made new materials (focus on metals).

and the start of the contract in September 1996, the process took less than two years, up to finishing the study, writing the reports and presenting the results to the Parliamentary Committee on Science on 1 April 1998, by the minister in charge.

The main products of the pTA arrangement were:

1 the questionnaire with a list of possible innovations and supportive policy measures; and
2 the list of recommendations at the end of the project.

Other products were the intermediate reports and the scenarios for the panels, all written by the ITA staff. The panels produced the final product, an assessment of the results of the two Delphi rounds. They based their work on the analysis and interpretation of the results as prepared by ITA. In a wider sense, all 1,100 respondents of the two Delphi rounds can be considered producers of the results. The products were internally reviewed; for additional statistical questions, ITA asked external experts to review the survey data. After finishing both Delphis, an external social scientist prepared an integrated report on four overlapping fields.

Apart from the formal presentation of the main results by the Minister of Science and Transport to the Parliamentary Committee on Science, the final product was designed for a broad audience. The results were widely disseminated through reports, in workshops and in presentations by ITA staff members and representatives of the ministry. They were intended first to address problems and present recommendations for technology policy actors in Austria (both on a national and a regional level), and, secondly, to reach the general public via the media. The most hoped-for impact was to promote networks between expert communities in science and industry. The ministry used the results, too, as an information input for the promotion of industry clusters, in priority setting and within a programme for technology development – in short, for the design of a technology policy proper.

Conclusion

The Austrian case studies presented here may appear somewhat untypical for pTA arrangements in comparison with other countries' contributions. The Salzburg Traffic Forum had many elements of a mediation process, the Ozone Consensus Conference was set up rather unprofessionally and was considered a failure, and the Technology Delphi built on a very special understanding of stakeholder participation. So far, there have been few successful approaches in Austria that could be considered bona fide pTA.

In search for a possible reason for this status quo the Austrian political culture comes into light. As already addressed in the introduction to this chapter, participation 'from below' is not a strong feature in Austrian politics. Until the present day, interests were taken up either by political parties or

interest associations, in a neo-corporatist way, determining even many aspects of everyday life. There was little room, thus, for stakeholder participation except from within those organisations that almost statutorily were entitled to represent certain interests. For lay participation, there was even less room, as lay persons were not considered competent. On the contrary, those addressing even their personal interests without being affiliated to one of the big interest-representing organisations ran the risk of not being considered legitimate as this was thought to be the duty of the latter.

However, over the last 25 years or so many citizens' action groups succeeded in exerting considerable pressure on regulatory decisions at the micro level. Not least to weaken the movement, participation on, for example, road construction plans etc., has become the norm today and has even been made mandatory by law. The citizens' movements community had considerable political success in the form of a Green Party gaining enough support to get into Parliament and stay there ever since. Nevertheless, participation at the level of master plans and policies is still rather unusual, especially with respect to new technologies. Only over the past few years have a couple of pilot strategic environmental assessments (SEA) on programmes and plans such as energy concepts or waste management been carried out and involved lay participants to some degree. Government officials in general remained reluctant to consider participation legitimate without a formal mandate. Additionally, the failure to influence technology decision-making was also due to a general absence of almost any coordinated technology policy that could be decided on. Consequently, protests were directed mostly against concrete large-scale projects.

Roughly once a decade, participation became a demand and was put on the agenda by mass protests against:

1 an atomic energy plant in the 1970s;
2 a hydro-electric power plant in the 1980s; and
3 genetic engineering in the 1990s.

The last incidence was the first time something abstract like a technology triggered public protests. This, however, had its ground mostly in concerns over food risks, easily elicited after BSE, providing a personal point of reference. These events were the visible parts of a grass-root movement that, however, did not succeed in impacting substantially the way political decisions were made and considered to be adequate among a majority of government officials.

Nevertheless, there were some starting points for expert and stakeholder participation in the consensus-oriented Austrian neo-corporatist model collecting, and considering, the comments of a broad range of organisations deemed legitimate before making a decision. This sheds new light on the fact that, in contrast to the Ozone Consensus Conference where lay participation was to the fore, the Technology Delphi with its emphasis on stakeholder (alongside expert) participation was considered a success, the Salzburg Traffic

Forum being somewhere in the middle. Hence, we can assume that there is a preference for stakeholder over lay participation in Austria. Any further attempts to promote pTA should therefore aim to take up such starting points in order to gain legitimacy with political decision-makers. This is not to say that there is no place, for example, for a consensus conference. However, such a conference can only be an experiment, in contrast to other European countries. Other forms building on stakeholder participation, though, could theoretically be considered able to gain higher profile with policy.

Recent political developments put a question mark on the tradition of broadly involving various interests and reaching a consensual solution. There is a strong tendency now to leave the path of consensual decision-making in favour of a more adversarial style. For future pTA arrangements, this may be an additional hazard. In a climate of top-down decision-making, participation would be deemed unnecessary and unduly time-consuming. Another aspect is that, in times of budget cuts, there will be no money for rather expensive participatory arrangements. Low-budget solutions like the Ozone Consensus Conference have shown to be inadequate. Hence, the future for pTA in Austria is currently rather gloomy.

There are two developments, however, that could reverse this trend. First, interest in matters political is rising again in Austria, not least due to the recent political events. This could in principle lead to a renewed interest also in technology policy and, hence, in the demand for more participation at the level of plans and policies (as in the case of genetic engineering leading to a successful people's initiative in 1997). The second reason is the renewed interest in public participation and accountability at the EU level, which is an effect of the perceived loss in public trust after the BSE and GM food controversies. The Commission's recent emphasis on the precautionry principle and the attempt to establish a new relation between science and society may create an environment where it will become increasingly difficult to pursue an efficiency-only-oriented style of regulatory decision-making in Austria.

Chapter 6

Denmark: Participation – A Given in Danish Culture

Case studies

- *Future Search Conference on Traffic in Big Cities 1998 (Copenhagen Traffic DK)*
- *Scenario Workshop on Urban Ecology 1992–3 (Urban Ecology DK)*
- *Voting Conference on Drinking Water 1996 (Drinking Water DK)*

Lars Klüver[1]

Introduction

Technology assessment in Denmark has, from its beginning in the 1970s, had the aim of establishing dialogue on technology. From the debates on nuclear energy, information technology and the environment it was obvious that technology would have a growing impact on the quality of life in the modern society. Technology assessment was initiated by the government, trade unions, universities, industry and NGOs, during the 1970s and 1980s (Klüver, 2000, Cronberg, 1992). Advocacy research, participatory design, science shops and public consultancy processes were established in this period, and the knowledge base on participatory methodology began to develop. Since then, the call for participation in Danish decision-making has been sounding louder, but in practice only few actors are committed to processes that build bridges between stakeholders, experts, politicians and citizens, on a national policy level.

TA-like activities are performed by various actors in Denmark. On environmental issues, co-operation between universities, trade unions and enterprises now and then is established on a project basis, in which methods of constructive TA are used. Interest organisations – like certain trade unions and environmental grass-root organisations – may initiate dialogue and participation in *ad hoc* co-operation. Medical TA, environmental 'best available

1 Authors of the three original case studies: Ida-Elisabeth Andersen (Urban Ecology), Søren Gram (Traffic Copenhagen), Anne Funch Rohmann (Drinking Water).

technology' programs, and technology foresight is institutionalised in the governmental agencies. Different forms of boards and councils have been established as more or less independent institutions that perform technology assessment like activities. However, participation is not necessarily an essential part of these TA-like activities.

In 1985 the Danish Board of Technology (*Teknologirådet*) was established as a parliamentary technology assessment institution, and the Board has the aims to: make TA activities, further the technology debate and to give advice to the government and the parliament. The law states participatory processes to be a key function of the Board (Act on the Danish Board of Technology, 1995), and since its establishment, the Board of Technology has been a main driver for establishment of structured democratic dialogue processes on technological issues.

The Danish tradition for public involvement goes back a couple of centuries to the growing democratic movements after the abolishment of feudalism. The liberated farmers organised themselves to form co-operatives and to educate themselves in modern agricultural technology and to be active participants in politics. The education of the farmers was initiated and encouraged by the Danish pastor and thinker N.F.S. Grundtvig, who is recognised as the father of the Danish 'public enlightenment' movement.

In Danish democracy, enlightenment and participation are seen as cornerstones of a well-functioning representative political process. The freedom of speech, freedom to organise, the right to vote, involvement in local decision-making are generally seen as hollow if enlightenment and dialogue are missing. However, Denmark suffers from very much the same problems of media-driven agenda setting and lack of contact between citizens, stakeholders, experts and politicians as most other western democracies. Many decisions of importance to democracy, welfare and daily life are taken in separate arenas – public authorities, research laboratories, private enterprises, between interest organisations etc. – without open democratic debate. Enlightenment is not the same process of dialogue anymore, but tends to be a stream of one-way information, orchestrated by the media.

Moreover, participation can be seen in many processes of the Danish society. Local environment planning has public hearing processes; the governing boards of schools have parents as members; the working environment, environmental and local agreements are negotiated in the Co-operation Committees of the Danish work places; and the voluntary sector is strong, with many citizens taking on tasks and responsibilities in sports clubs, nature and environment organisations, Agenda 21 projects, foreign aid activities etc.

The Case Studies

All three Danish case studies in the EUROPTA project were performed by the Danish Board of Technology. The Board is a main actor in pTA in Denmark, and the selection of the three particular arrangements was made on the basis that it gives a good picture of the cross-section of participatory methods used by the Board of Technology.

The cases involve three methods, ranging from a stakeholder-oriented method (future search conference), a deliberative polling procedure (voting conference) to a foresight and planning method (scenario workshop). The future search conference was 'imported' and performed strictly as described by its developers (Weisbord and Janoff, 1995), and the case describes its first-time use in Denmark. The voting conference was developed by the Board of Technology for the specific purpose of involving experts, politicians and citizens in a poll on competing action plans on ground water resources. The scenario workshop was designed by the Board in order to develop local visioning and action plans on a future development – urban ecology.

The three methods need to be understood as only a selection of methods from a broad toolbox used by the Danish Board of Technology[2]. The Board makes use of methods that can roughly be separated into five groups:

1 expert-oriented methods;
2 stakeholder-oriented methods;
3 public consultation;
4 advisory services;
5 public enlightenment and information.

The five groups cannot be sharply separated. For example, there are elements of information and advisory functions in all of them, and experts, stakeholders, politicians and citizens can be involved in most methods. However, it makes sense to differentiate between these five groups, because they reflect the different weight that is given to certain actors or to certain target groups in the methodology of TA.

All five groups contribute to the overall aims of the Danish Board of Technology of supporting the democratic political mechanisms of society by giving them input or helping the process of communication and deliberation. The intention with this broad toolbox is to be able to match the specific demands that are posed by the very different problems involved in socio-technological issues. Such demands may, for example, be the need for a strategic and coherent set of options for action; the need for breaking down barriers to a certain envisaged development; the need for setting the agenda; or the necessity of being able to provide a timely advisory service.

Traffic Copenhagen[3] (Copenhagen Traffic DK)

During the 1990s, Copenhagen was exposed to increasing traffic. Major infra-structural decisions were made: a Metro; new motorways and railways to the airport; a bridge to Sweden. In the future, more infra-structural decisions may

2 An overview of the methods used at the Danish Board of Technology is available at www.tekno.dk
3 The full case study was described by Søren Gram and Lars Klüver. Søren Gram was project manager of the Traffic Copenhagen project.

be taken: expansion of the Metro, a bridge to Germany, and a beltway around the city.

In the same decade the environmental problems related to the increase in traffic, especially regarding noise. Compared with many other capitals in Europe, traffic logistics are reasonable, but there is a consensus that it is getting worse and may soon become unacceptable.

A coordinating body, '*Hovedstadsrådet*' (Council of the Capital) was abolished in the beginning of the 1990s, and since then infrastructure decisions have more or less been taken case-by-case and not as part of overall planning.

The development of urban traffic in Denmark is driven by an interaction between market forces, interest party influence and political agendas. The Copenhagen region has several municipality and county bodies charged with transport planning and management, and three public transport organisations. This split of responsibility about planning led to a situation of mutual obstruction of new planning. All stakeholders, from the bicycle interest organisation to the national motorist organization, had their own view of the situation: who was to blame and what should be done.

The Project

This deadlocked situation was the point of departure and the reason why the Danish Board of Technology intervened and proposed that relevant social actors co-operate in a participatory project on the traffic of Copenhagen.

In order to initiate a constructive debate among the stakeholders, the Danish Board of Technology launched a method developed in USA – the future search conference. The inventors of the method describe it as suitable to find common goals and ways of action, in a situation of standstill and mutual counteraction. Instead of facilitating a debate about the controversies and interests, this method seeks to find some visions that the actor groups can all accept, and develop a common ground on which action plans that can gather broad support can be developed.

The conference was held in March 1998. One of the initiatives, taken by a group of participants during the conference, was to work for the establishment of a coordinating body in Copenhagen. Since then, it has been decided by the Danish government to establish the Development Council of Copenhagen that has, as one of its responsibilities, to coordinate traffic planning of the region.

The project had a budget of DKK 200,000 (27,000 EURO). On top of this came staff expenses of 3 man-months of project manager, and 1 man-month of technical/administrative staff. The duration of the project – from project approval to the publication of the report – was five months.

The Arrangement: Everybody in One Room

The future search conference is a large group meeting that brings the 'whole

system' into one room to work on a task-focused agenda, in which the participants have an opportunity to take ownership of events in the past, present, and future, confirm their mutual values, and commit to action plans grounded in common visions. The aim of a future search conference is to engage the social actors in a joint process assessing a social and political issue and identifying common grounds, on the basis of which action plans are worked out.

This first Danish future search conference, '*Storbyens Trafik*' (City Traffic) was implemented 'by the book' to try out the method in a Danish context.

A very important player in the future search method is the advisory committee. The committee stands as a guarantor for the participation of all stakeholder groups in the process, and accordingly it has to be composed of persons who are able to commit the actors to invest the needed time and effort in the process.

The conference involved 64 participants, eight from each of the following eight actor groups:

1 business/economy;
2 politicians;
3 officials;
4 experts;
5 environmental organizations;
6 organizations of cars and road traffic;
7 citizens using cars;
8 citizens using bicycles and public transportation.

Ideally, all 64 participants are involved throughout the three-day conference. In practice, however, some last-minute cancellations modified this, and the conference on '*Storbyens Trafik*' had 58 participants.

The participants were, whenever possible, personally selected by the advisory group. Only when the knowledge of relevant persons was scarce, were specific organisations contacted to suggest participants. The participants were supposed to be involved in the process in their own, personal capacity, with their own views and experience, although it was expected that they would take back the conference results to their organisations afterwards.

The eight groups were composed to give a relevant spread of participants in the respective actor categories. Key persons in planning and policy implementation within their organisations were given priority. These criteria obviously did not apply to the citizens groups, and therefore, these were selected at random from a 2,000-strong representative sample of people living in and around Copenhagen.

The length of the conference was three days. Most of the conference work was made in groups of eight participants, followed by plenary sessions. The participants did not meet before the conference, were not supposed to prepare themselves, and did not receive introductory material. The conference draws upon the personal experience of the participants.

The conference programme of the future search goes through five phases:

1 review the past;
2 employ the present;
3 create ideal future scenarios;
4 identify common ground;
5 make action plans.

The five phases were performed by groups of eight, with changing composition during the conference. Work on the past and on the future was carried out by mixed groups with participants from all stakeholder groups. Work on the present was done by stakeholder groups whose members had some shared perspective on the task. Action planning employed both stakeholder and self-selected groups. Each phase concluded with a plenary dialogue.

As an opening to the conference, participants were asked to review, on the basis of their own personal experience, Copenhagen's transport situation for the past 40 years. They were then asked to assess the present situation. This process of reviewing the past and present was to make the participants focus on the historical background of the situation. The process, then, aimed to go beyond the reiterating of, often intransigent, viewpoints and, thus, to create a better understanding of the participants' personal experiences, values and motives.

In the third phase, the participants brainstormed ideal future scenarios. Following this, the participants were asked to develop common visions, which they could agree to work with in the following phases. The focus of attention was on identifying shared values, needs and expectations amongst the social actors. Whilst it is acknowledged that there are plural expectations, conflicts and differences between the stakeholders, the aim of this phase is to find the common ground amongst the participants, as a viable basis for future policy and decision-making. In practice, this is done by 'parking' any vision that cannot gather unison support.

In the final phase, the identified common visions were transformed into action plans. The participants could make the action plan either together with their own stakeholder group, or by inviting other participants to form an *ad hoc* group in order to pursue a certain vision.

The future search method sets up a programme track that asks participants to take responsibility for their own past involvement in the issue and to uncover their visions for the future without the possibility of forcing the framing of the issue onto the other participants. In this respect, the future search method imposes a certain set of rules for discourse on the participants. These rules are far from those of real life, since formal power means very little in the future search. The future search may be described as a method that overrules a situation of unconstructive use of power, thus supplying the participants with a moment of equal interaction.

Outcomes

The conference reached, to the surprise of most participants, relatively broad agreement on a vision of a more green and quiet city.

One main action, supported by a broad group of the participants, concerned the establishment of stronger and more coherent coordination of traffic planning in Copenhagen, and this would take a new coordination actor. A group of participants with representatives from several stakeholder groups was created at the conference with the aim of working towards the formation of an advisory board in relation to traffic. But after a few meetings and an enquiry to the Minister of Transportation, this scheme seemed not to be successful.

An internal project evaluation carried out by the Danish Board of Technology half a year after the conference indicated that the concrete action plans developed by the various stakeholder groups at the conference did not make a big difference. After the conference, however, the management of the Danish Board of Technology on two occasions presented the conclusions of the conference – that the 'whole system' of transportation in Copenhagen during a three-day conference had wanted a coordination actor – to the Minister for Transportation and the chairman and some members of the Committee of Traffic of the Parliament. One year after the future search, a coordination body for the development of Copenhagen was set up, and one of the central tasks for the body is to coordinate traffic planning.

It is difficult to influence the discussion of transport policy. Visible impacts of the conference could not be identified at the point of evaluation after six months. Although the method allows for constructive, improved discourse and deliberation amongst participants, at the evaluation many participants expressed the opinion that the method did not allow enough time for the translation of the common visions into proposals for concrete action. Because of that, the time scheme of the method may have limited the impact on policy-making outside the group of participants. Further, the issue of urban traffic was more general of character than the neighbourhood mediation for which this method was developed. However, the status of the Board of Technology, as a pTA institution near to politicians, seems to have compensated for these weaknesses of the method.

Urban Ecology[4] (Urban Ecology DK)

Urban ecology grew in importance in the public and political debate with the increasing awareness of environmental problems following the Brundtland report 1986 and the Rio Conference in 1990. In 1990/91, declarations of the Danish Government and Parliament stated that environmental sustainability was a central goal for development in all parts of society. Sustainable urban

4 The full case study was described by Ida-Elisabeth Andersen and Lars Klüver. Ida-Elisabeth Andersen was project manager of the Urban Ecology project.

development was one such goal, which enjoyed a wide consensus, because it was evident that the turnover and use of resources in urban areas constitute big environmental problems.

Urban ecology, however, was not a well-defined concept. The involved technological solutions were in general not fully developed. There were problems of legal demands that did not fit with the available technologies, and agreements about the tools and the responsibilities to accomplish the necessary changes had not been established.

The Danish Board of Technology decided to launch a project on urban ecology in order to make the players meet, to foster common understanding of urban ecology, to develop a new mode for co-operation, and to find solutions to the barriers for a sustainable urban development.

It was a basic assumption that sustainable, long-term solutions could only be found by involving the actors in the field, because the problem had so many aspects connected to different actors:

- various technological options (technical experts);
- different types of knowledge (residents, NGOs, experts);
- a broad spectrum of laws, rules and policies from different authorities (policy-makers, politicians, administrators at central and local level);
- various places and levels of action and several possible solutions (business, banking/investment, energy and water suppliers, residents, municipalities, research).

The methodology developed for this purpose by the Danish Board of Technology was the scenario workshop. It was developed as a new method, because there seemed to be no known method specialised to explore various possible future technological strategies and at the same time to make the actors co-operate on the choice and implementation of a strategy.

A scenario workshop is a local meeting, where scenarios are used to stimulate vision-making and dialogue between policy-makers, experts, business and concerned citizens. The workshop participants carry out the assessments and develop visions and proposals for technological needs and possibilities.

The Urban Ecology project had a budget of DKK 750,000 (100,000 EURO). This includes expenses for consultants on development of the method, but not staff time expenditure at the secretariat of the Board. Staff accounts for approximately nine man-months' academic staff and three man-months' technical/administrative staff. Initiation to final conference took around 18 months.

The Process: Scenarios, Workshops, Conference and Local Debate

Four scenarios (Morten, 1992) were developed as input to a first round of workshops. In addition, a reference scenario was made to describe variables such as the composition of the population, the types of households, the size and composition of energy consumption, the water supply, wastewater and

solid waste. The reference scenario was a 20 years' extrapolation from today's situation.

The four scenarios were described qualitatively, to show alternative pictures of everyday life in future households ('a day in the life of the Hansen family in 2010'). The questions treated in the scenarios were:

1 How are energy provision, water supply, wastewater and solid waste management arranged in the future? How could technology solve problems related to sustainable urban living? Will high- or low-tech solutions dominate?
2 Who will take care of and be responsible for the required solutions – users and local residents; investments and innovation by the private sector; public authorities, through regulations and large infrastructures?

The four scenarios represented four different combinations of the two dimensions: technology (low/high-tech) and organisation (individual/private/public responsibility).

The workshop process involved eight workshops with altogether 90 participants in four local communities. The participants were recruited from four role groups: policy-makers, experts, residents and business sector. Each participant took part in two workshops.

The workshop process had three principal steps, inspired by the future lab method (Jungk and Müllert, 1984):

1 To comment and criticise the scenarios by pointing out barriers to realising the four scenarios.
2 To develop the participants' own visions and proposals.
3 To develop local plans of action.

The first workshop round consisted of *four role-divided workshops*, where each of the four role groups met separately (e.g. all policy-makers) with the objective of pointing out barriers to the four scenarios and developing visions and proposals. The scenarios were sent to the participants in advance and were presented at the workshop.

Before the second round of workshops, the planning group made a report on the results of the first round. This report looked 'across' the four role workshops and commented on important issues, common ideas and visions from the four role groups and where the differences could be found.

In the second workshop round, *four locally based workshops* were held with local participants across the role groups. The report from the first round, together with a presentation on the 'urban ecology situation' by the local authorities, constituted the main input to the second round of workshops. The task was to develop local plans of action in areas of energy, water, wastewater and solid waste management.

A facilitator guided the process. Different techniques could be employed by the facilitator to accomplish dialogue and the production of results in the form of identification of barriers, visions and proposals for action.

After the workshop phase a report was written and a national plan of action developed. The results, visions, and ideas were locally produced and mainly had a local perspective, though national problems and solutions were also found. A cross-wise analysis of the locally produced results was necessary, in order to transform them into a product fit for national policy-making. The project team and planning group did the transformation.

The scenario workshops were concluded with a national public conference in January 1993, which was attended by 200 participants. At this conference the outcome of the eight scenario workshops was presented, but the focus was mainly on the national action plan.

In order to further the local debate and the implementation of urban ecology, a 'do-it-yourself package' for local initiatives was produced. It comprised the scenarios, the video and a catalogue of persons and organisations to contact for further information. This package was used in more than 100 local debate arrangements, supported economically by the Danish Board of Technology, during the next 2–3 years. A fair guess might be that the project in this way has affected and involved 1,000–3,000 people.

Deliverables from the project were:

- a national plan of action for urban ecology;
- recommendations for regulation on sustainable urban renewal;
- two booklets – one with the scenarios and one reporting the project;
- a video and a do-it-yourself package, both for local debate;
- articles in the Board of Technology's magazine;
- press releases in conjunction with the events of the project;
- a final document, including the national action plan;
- a project publication for the Parliament (briefing note).

Project Organisation

The Danish Board of Technology established a planning group, composed to ensure a balance of attitudes to the subject. The nine members of the planning group were experts, interest parties and governmental policy-makers. They were to be resource-persons as well as to ensure transparency in the planning process. The group was charged with the following tasks:

- secure a fair implementation of the project;
- employ experts to prepare scenarios;
- participate in discussions of scenarios and suggest proposals for improvements;
- define the criteria for selection of local areas and approve the final selection;
- define which interests should be represented among the participants;
- prepare the compilation of results.

A project manager from the secretariat of the Danish Board of Technology had the responsibility for the organisation and the course of the project. A project team was established with the project manager, an external expert on urban ecology, and two advisors.

Four local communities were chosen in which activities of urban ecology had already been going on. This was to ensure a certain interest and experience from the local authorities and the participants. The four local communities were of different types and sizes.

The selection of 20–25 participants was made in the four municipalities. Five to seven persons from each of the four local actor groups were selected. In general, the search for local participants was made through networking (co-nomination). The planning group and the local contact persons played a consultative role in the selection of experts and business participants; the project manager made the final decisions in co-operation with the project team.

Role and Impact

One main result of the project was the increased dialogue amongst actors, both at local and central policy-making level. According to an internal project evaluation, the participants' evaluation after the workshops was very positive (Andersen *et al.*, 1993). In particular, they emphasized the possibility of bringing the ideas of ordinary citizens to the attention of policy-makers, and to meet and to learn from other actors.

The project revealed on the one hand the need for local action that fits with the specific local circumstances, and on the other hand the need for national initiatives to support research, flexibility in regulation and experimental full-scale projects.

Denmark had a change of government at the time the project was about to finish. The new Minister of Environment decided to take up urban ecology as a new policy field, and, inspired by the recommendations from the national action plan, he established an Urban Ecology Committee. The committee adopted the main proposals from the action plan and it was later decided to establish a Danish Centre for Urban Ecology, and a Green Foundation. The foundation financed activities such as the Ecological Council, the Association of Green Families, and Local Green Guides, until its abolishment in 2002.

After the end of the project, the methodology was 'exported' to the Innovation programme of DG XIII, the European Commission[5]. The Commission was looking for a method for making awareness on technological development and found the scenario workshop method potentially useful for the purpose. The Commission initiated a project in 1994 in which training of national project managers, methodology training material, etc. was made. Pilot projects were made in several European countries, and the

5 See the Scenario Workshop web page of the European Commission: http://www.cordis.lu/easw/home.html

Commission supported scenario workshops in the member states for the years to follow.

Today the scenario workshop methodology is widely used – in education, research and by consultancy firms – in Denmark and even more so abroad due to the EU follow-up.

Drinking Water[6] (Drinking Water DK)

In November 1996 the Danish Board of Technology launched a new method – a voting conference – in order to contribute to the debate on the pollution of drinking water from agriculture.

Danish drinking water supply is drawn from groundwater, for which a simple water treatment system is in place. In several places, however, the groundwater is too polluted for use as drinking water. The agricultural sector of Denmark occupies two-thirds of the total area, and this area hides the bulk of drinking water beneath it. The agricultural sector therefore is a critical factor to the quality of groundwater. The conference focused on the surface load and the increasing groundwater problems caused by the use of pesticides and fertilizers (especially those that are nitrogen-based).

From time to time, this issue has been surrounded by much debate in the press. The project was set up as a quick response to intense media coverage of several cases of groundwater pollution. The public debate on the issue was mostly driven by such cases of pollution, with the patterns of reactions by the various actors involved usually rather predictable. Public authorities were only to a very low degree involved in the social debate, and when it happened, they mostly defended the existing regulation, with a reference to ongoing negotiations on certain chemicals at European Union level.

At the conference, the actors had very different views on the state of the problem and of the actions needed. Roughly characterised, the positions were as follows:

- The agrochemical actors (chemical industry; agriculture organisation) focused on the lack of evidence on health problems from water pollution. They pointed out that most of the pollution problems today were caused by chemicals used years ago. The regulation of chemicals by public authorities were seen as a guarantee for a safe use of chemicals. The agricultural sector found that they were already regulated enough compared with international agriculture and taking competitiveness into account. They suggested a long-term controlled downscaling of the use of pollutants and warned against the economical effects of drastic actions.
- The water companies and the County Councils called for a political agenda for unpolluted drinking water. They suggested establishing

6 The full case study was described by Anne Funch Rohmann and Lars Klüver. Anne Funch Rohmann was project manager of the Drinking Water project.

dedicated water resource areas with restriction on the surface load and a possibility for local policies on restrictive water resource management. They warned against the big economic consequences that a centralised and advanced water treatment would have.
- The NGOs argued for organic agriculture to become much more widespread, and were in favour of a ban on any fertilizer or pesticide that was suspected to be a pollutant. As organic agriculture is supposed to solve much of the problem, they suggested to 'de-technologise' agriculture and forestry.

The Arrangement

The objectives of the voting conference were: to stimulate and enlighten public debate; to clarify which possible ways there are to ensure clean drinking water; to consider various viewpoints and strategies; and to make visible any differences in opinions between politicians, experts and citizens.

The voting conference put drinking water to the vote by 180 participants: 60 citizens (randomly invited, randomly selected amongst those interested), 60 experts (from a broad range of disciplines, institutions and organisations) and 60 politicians (from the Parliament, counties and municipalities). The 180 participants were supposed to choose between five action plans for ensuring clean drinking water. These plans all answered the question of how to ensure unpolluted drinking water in the future.

The composition of participants was made for several reasons:

- One could imagine, that the three groups would have different rationales towards the problem. If this were true, it would be important to document it.
- Experts, politicians and citizens all have influence in science/technology. However, all three groups are heterogeneous, and so a broad representation from each group was necessary.
- For practical reasons, the conference could have no more than 180 participants in the audience. However, an expert in survey methodology advised that a 60-person citizens group would be representative. (This surprising message was tested later by a 1,000-respondent representative national survey, and it proved to be right.)
- The expert group composition would have to be mixed and balanced, regarding the expected differences of positions.
- The politician group would have to be mixed regarding: central/regional/local; party membership; geographical area, as these parameters could affect the outcome.

Ahead of the conference, each participant received conference material on drinking water and groundwater. This was done to outline the starting point of the conference and to offer the participants the opportunity to familiarise themselves with the subject and consider the matter in advance.

Five actors presented their individual plans:

1 The Council of Agriculture (organisation of Danish agriculture).
2 The Danish Agrochemical Association.
3 The Danish Association of County Councils (the counties have the responsibility for water resource planning).
4 The Watershed Information Centre for the Protection of Groundwater within Agriculture (an NGO).
5 The Danish Water Supply Association.

After each of the five presentations, the audience was allowed a short question/answer session in which they mainly would clarify factual issues. In addition, a general deliberation in plenary was held after the five presentations, in which the five action plans were debated and compared. Eventually, each participant filled in a ballot paper by placing a cross against the action plan that they found would be the best to ensure clean drinking water. The individual participants remained anonymous but were registered either as citizen, expert or politician.

The ballots were registered and counted on-site, and the results could be followed on a screen as they gradually were registered. Once the results were known, they were analysed and commented on by a public opinion scientist. This was followed by a debate, initiated by the reactions to the results of a panel of MPs.

A debate booklet was published with the presentations and results, together with the information material for the participants.

The conference was planned in co-operation with a planning group consisting of representatives from the same five stakeholders who would present action plans. The specific role of the planning group was to participate in the preparation of conference material, and thereby to ensure that the material was neutral or at least reflected a balance of attitudes.

The used method – called a voting conference (Danish *Afstemningskonference*) – was developed by the staff of the Danish Board of Technology for the purpose of this activity. The intention was to develop a polling method with a deliberative element, which made it possible to separate between the voice of the citizens, the experts and the politicians. It should involve an open confrontation of the vested interests, give the audience a role, serve as an alternative to polls, and be a public event. The method would have to be cost effective too.

The Drinking Water project had a budget of DKK 135,000, plus a budget for a debate booklet of DKK 100,000 (total budget DKK 235,000, or 32,000 EURO). This does not include staff of which four man-months' academic, and 1 man-month of technical/administrative staff was used, at a cost of approximately DKK 150,000 (20,000 EURO).

Results and Impact

There was a clear, overall result from the citizens, experts' and politicians' vote – namely, the plan from the Danish Water Supply Association was the winner, gaining just one vote over the plan of the Watershed Information Centre (NGO).

The most telling result was probably that the Watershed Information Centre plan, the most radical plan presented, was popular with many participants. Almost 50 per cent of the citizens voted for the Watershed Information Centre plan, which called for a ban on the agricultural use of pesticides, but with economic compensation for lost income in agriculture. It also attracted about 33 per cent of the experts and 33 per cent of the politicians.

The agricultural sector plan – like that of the Danish Association of County Councils – won 14 per cent of the total votes, whereas no one voted for the plan of the Danish Agrochemical Association. Four participants stated that they were unable to decide which plan they preferred.

Alarming findings of chemicals in groundwater at the time before the pTA arrangement were heavily covered by the press. The press extensively covered the conference as well.

After the voting conference, the agriculture organisation publicly questioned the results (even with an intervention in Parliament). One point of criticism was that the citizens' group was not representative. In response to this criticism, and as a follow-up to the conference, the Board of Technology commissioned a representative opinion poll (n = 1,000) containing the same questions as discussed at the conference. The results from the opinion survey and the conference vote were identical, almost down to the last digit.

At the time of the conference there was not much knowledge about the consequences of reducing the use of chemicals in agriculture. Some of the actors pointed out that reducing chemical usage would reduce productivity in agriculture, lead to lack of food products and harm the economy in agriculture and in society as well. After the conference the Danish Board of Technology initiated a study of the economic consequences of reducing the use of chemicals in agriculture. This was followed up by a similar study, initiated by the government.

One objective of the conference was to test a new method in technology assessment. The method was successful in the specific project, but obviously, not all kinds of subjects can be handled this way. The aftermath with one of the actors did give rise to some lessons learned at the Board: mainly, it seems reasonable to expect fast and serious critique from the 'losers' of the vote. The staff of the Board learned that it is necessary to be ready to initiate larger polls to be able to validate the result of such a controversial method.

Discussion

As the three cases show, in Denmark pTA is settled as an integrated part of parliamentary TA methodology. It is the view of the Danish Board of

Table 6.1 *Differences behind the Choice of Methodology*

	Traffic Copenhagen	Urban Ecology	Drinking Water
Topic	Planning of traffic and infrastructure in the capital of Denmark	Sustainable housing and living in urban areas	Surface pollution of ground water by agriculture
Aim	Contribute to better coordination by making the actors develop common ground	Make visions and action plans for urban ecology in four urban areas	Carry out a poll on five actors' action plans, by citizens, experts and politicians
Method	Future search conference	Scenario workshops	Voting conference
Origin of method	USA: developed for neighbourhood mediation	Board of Technology: inspired by the Austrian future lab method (Jungk and Müllert, 1984)	Board of Technology
Characteristic features of method	To create common ground between competing or opposing actors. To break deadlocked situations	Create visions, co-operation and action plans on an issue of shared aims	Evaluate competing suggestions to solve an issue of conflict
Participants	Representatives of all influential and/or affected actors	Affected parties, experts, public administration and others that wish or have to contribute to the future solutions	Stakeholder groups to suggest solutions. Citizens, experts and politicians to evaluate solutions

Technology that the objectives of the Board – to provide input and process to democratic political mechanisms – can only be fulfilled if participation makes up a profound part of the modes of work, since the political mechanisms include complex processes involving policy-makers, politicians, stakeholders, experts, citizens and interest groups.

Table 6.1 shows the close connection between the topic, the aims, the choice of method, and the selection of participants, of the three Danish participatory arrangements.

A key to the selection of methods in the Danish approach is the analysis of the project situation and definition of aims of the TA project. In the three cases, the aims are very different, meaning that they cannot be pursued by the same method. In two of the cases (Urban Ecology; Drinking Water), the required process could not be found within existing methods, so new methods – in both cases building on known techniques – had to be designed. For the third case (Traffic Copenhagen), a method was 'imported' from the area of social mediation in order to be able to make a targeted contribution to the communication between the involved parties.

All three cases involve *a cognitive and normative, as well as a pragmatic dimension*, but with differing emphasis. This difference can be seen as a result of a sophisticated methodological choice of techniques/function in the method, aimed at generating the needed outcome/role of the arrangement as a whole.

The future search method of Traffic Copenhagen supplies the participants with new knowledge on the historic and present influence made by other

actors. These cognitive elements help the participants to work on a common basis regarding the insight into the state of affairs. The process of future search activates the different normative stands of the participants, by allowing them to veto the visions and actions of other participants that they find are violating their values or interests. This right of veto makes it possible for them to maintain their normative stands and interests in a process of search for common ground and common actions. On a basis of understanding of the history, positions and values in play, the participants can begin to suggest common visions that have a bigger chance for survival in the negotiations between the parties. In that respect, the emphasis of the method lies on the pragmatic dimension, but the fundament is build of the cognitive and normative elements of the method.

The Scenario Workshop on Urban Ecology gives insight into present needs, available technology, and possible future scenarios. Thereby it establishes a cognitive starting point for the process and an understanding of the local situation. The participants are split into groups of specific roles in order to respect their normative stands and special interests, and these groups make the critic and vision phases. The pragmatic element plays a major role when it comes to future perspectives and action. The emphasis of the full process lies on the cognitive elements (understanding urban ecology) and the pragmatic (looking for local and national actions to be taken).

The voting conference method used in Drinking Water has its emphasis on the cognitive and normative elements. As a basis for the process, a factual conference information material was given to the participants in order to ensure a certain level of knowledge on the state of the problem of pollution of drinking water. This cognitive element was supplemented by input at the conference on water resource knowledge and on the action plans that were suggested by some prominent actors. On the basis of this level of information, the participants voted on the action plan that they preferred. By being a polling method, the voting conference results in an outcome made through an 'informed decision', which leaves room for rational decisions as well as normative choices. But it leaves very little room for bargains, negotiations or consensus building. This low level of pragmatic process makes the method more 'confrontational' than the two other methods.

As a selection of Danish stories on pTA, *the three cases reflect a typical scenery*. Part of the picture is the strategic use of a broad scale of methodological tools, of which participation is an important section. Another part is the instrumental approach in which participation seldom is an aim in itself, but rather is seen as a necessary and effective function in policy deliberation and decision-making. And the overall impression of the scenery may be that it reflects a general Danish acceptance of participation as a valid and uncontroversial element of democracy.

Chapter 7

Germany: a Difference that Makes a Difference?

Case studies

- *Citizens' Forum on Biotechnology 1995 (Biotech Baden-W. GE)*
- *Genetically Modified Plant Discourse 1991–3 (Discourse GMP GE)*

Fritz Gloede and Leonhard Hennen

German Experiences with Participatory Technology Assessment

From the beginning of the 1970s, technology assessment (TA) in Germany was taken up as a field of research and policy consulting in several institutions at universities and research centres. For the year 1999, a German TA database counted 309 institutions that were actively involved in TA of one kind or another, including 155 university institutes, 67 publicly funded (research) institutes, as well as 87 private organisations. Within this diversity, however, there are only a few institutions that are explicitly and exclusively dedicated to TA. These form the core of TA activities in Germany and can be seen as opinion leaders regarding practical, theoretical and methodological issues of TA. Apart from TA units or institutes at national research centres (among which the Institute of Technology Assessment and Systems Analysis – ITAS – at the Research Centre Karlsruhe has been the pioneer of TA in Germany since the early 1970s), the currently most prominent ones were all established in the 1990s: the Office of Technology Assessment at the German Parliament (*Büro für Technikfolgenabschätzung beim Deutschen Bundestag*, TAB), which is run by ITAS on behalf of the German Parliament since 1990; the Centre for Technology Assessment in Baden-Württemberg (*Akademie für Technikfolgenabschätzung in Baden-Württemberg*), which was set up by the government of the *Land* Baden-Württemberg in 1995; and the European Academy for the Study of Consequences of Scientific and Technological Advances, established in 1996 by the Federal Ministry of Research.

Participation has been an important issue in TA conceptualisation and methodology in Germany right from the beginning, but it became particularly prominent in the 1990s, at a time when several important TA institutions were set up. Interestingly, however, the participation of stakeholders and lay people has only really been practised as an integral part of TA methodology at the Centre for Technology Assessment in Baden-Württemberg. Whereas the TAB is mainly dedicated to classical policy consulting, while the European Academy focuses on academia, the Centre for Technology Assessment routinely organises 'discourses' (with experts, stakeholders and lay people) within most of its projects. It is thus arguably the most active TA institution as far as participation is concerned.

This is not to say that there have not been any other practical initiatives of public participation concerning technology-related issues. For example, in a number of so-called 'planning cells' (*Planungszellen*), which have been used on various occasions in local or regional planning, groups of randomly selected lay people were invited to deliberate on policy issues over a weekend, in order to come up with advice of their own directed at decision-makers (Dienel, 1997). Furthermore, during the 1980s and 1990s several attempts were made at involving lay people and stakeholders in participatory procedures related to political or administrative decision-making at local or regional level. These were mainly related to ongoing technological conflicts, such as waste disposal and waste treatment. These kinds of initiatives mainly drew on models of conflict mediation and, as such, were not usually part of TA projects in the more narrow sense.

The 1990s experienced something of a 'boom' in participatory technology assessment (pTA). Due largely to public controversies on modern biotechnology and political discussions of the German public's reluctance to adopt this new technology, the issue of the involvement of non-experts in technology policy-making and TA gained prominence. Among TA experts and social scientists a more theoretically inspired discussion of the relationship between modern technology, public controversies and technological decision-making focused on the potential of pTA as a means of fostering rational decision-making (Hennen, 1999). The pros and cons of applying the Habermasian concept of discourse ethics to practical attempts of participation in technology assessment became a common point of reference in this discussion (see contributions in Prittwitz 1996; and Koeberle *et al.* 1997). Practical initiatives of pTA carried out in the 1990s mainly focused on biotechnology. Apart from the two initiatives presented in more detail below (Discourse on Genetically Modified Plants, Citizens' Forum on Biotechnology), a project on risks and safety of biotechnology was carried out by the Office of Technology Assessment at the German Parliament (Gloede 1997); and a discourse procedure on biotechnology involving a broad range of interest groups was held on behalf of the government of the *Land* of Lower Saxony (Saretzki, 1996).

More recently, the discussion of pTA has somewhat abated. Theoretical discussions appear to have come to some sort of 'settlement' by stating the restricted impacts that projects like that of the discourse project of the Science

Centre in Berlin (see below) have had on political decision-making, and by rejecting hopes to establish consensus on contested issues through the organisation of discourses among stakeholders. Thus, the discussion has more or less brought pTA back to its 'roots' in that participation is understood as a part of the role of TA to generate knowledge on technological issues by referring to different scientific and social perspectives. However, participatory initiatives continue to be held by the Centre for Technology assessment in Baden-Württemberg. Also, at the time of writing, a Danish-style consensus conference on genetic testing was in planning by the Deutsches Hygiene Museum in Dresden, with partial funding from the Federal Ministry of Research.

Citizens' Forum on Biotechnology/Genetic Engineering[1] (Biotech Baden-W. GE)

The Citizens' Forum was organised by the Centre for Technology Assessment in Baden-Württemberg. In its own words, the Centre's mission is 'to point out the opportunities and the possible risks involved in the development and use of technology, and – in a societal discourse – to make alternative courses of action clear' (Self-portrayal: www.ta-akademie.de). Constitutionally, the Centre is an independent research institution, headed by a research directorate, which is accountable to a steering committee. The latter includes: delegates from each of the political parties represented in the state legislature of Baden-Württemberg; representatives of six Ministries of the State Government; and representatives of business, the churches and trade unions. In keeping with its mandate, the Centre understands TA as a contribution to public discourse. The implementation of TA projects typically comprises the active co-operation with a network of scientific experts, as well as the inclusion of 'non-scientific expert opinions' and 'societal value judgements' through stakeholder and citizen participation. The Centre's responsibilities include advising politicians as well as furthering public discourse. Its goals and methods reflect, on the one hand, the need of politicians to obtain scientifically well-founded advice on the subject of new technologies in view of their growing importance for regional economic development and, on the other, the acknowledgement of the need to react politically to public controversies on technology.

The Arrangement

The Citizens' Forum (see Figure 7.1) was carried out in the summer of 1995.

1 Basic insights for the two case studies were drawn from interviews with the project leaders of the respective pTA procedures. The authors have to thank Thomas von Schell and Barbara Kochte-Clemens (Citizens' Forum) and Alfons Bora (WZB Discourse) for their open and instructive information.

It consisted of a number of meetings based on the model of the Planning Cell (Dienel, 1997). A special feature of the Citizens' Forum was that it was not carried out as a singular event, but in the form of eight separate forums (each having the same sequence of meetings), which took place in three different cities. Altogether, 194 lay participants were involved. They were given lectures by experts on 'gene technology and agriculture' and 'novel foods', which had been chosen as topics by the organisers. The issue of genetic engineering for medical and pharmaceutical purposes was said to be relatively less controversial in public debate, and was thus omitted. Within the context of the above two topics, an introduction to the scientific and technical basics was given, followed by a discussion of: how to deal with unknown risks during implementation of genetic engineering; the economic importance of genetic engineering in the various fields of application; and the question of the State's role in the development and regulation of genetic engineering (*Bürgergutachten*, 1995, *Dokumentation*, 1996).

The daily agenda of the four-day meeting provided for a mixture of lecture, discussion with the speaker, and internal consultation among the citizens. These consultations were organised as small-group discussions (about five participants each). In the small groups, for example, a fictitious 'hearing' on a deliberate release experiment was prepared and afterwards – again in small groups – an evaluation of the themes discussed was undertaken. A total of 39 small-group discussions were carried out, in which statements (votes) on the various questions were given. The separate statements were not summarised by the participants in the Forum, but were compiled to form a Citizens' Assessment by the Centre for TA at the end of the Forum.

The group discussions were opened with a given group assignment (for example, evaluating pre-selected newspaper clippings on the subject of genetic hazards). The organisers put open-ended questions, such as whether dangers for human beings and the environment could arise out of genetic research, and how detailed is our knowledge about potential hazards? Additionally, they put standardised questionnaires with pre-formulated responses, such as 'manipulating transgenic animals which produce medicines: I approve; I do not approve; I approve under the following conditions: …'. Similar questionnaires were also filled in by individual participants.

The results of this pre-set, structured procedure were made public in the form of a document that was given the name 'Citizens' Assessment' (*Bürgergutachten*, 1995). In addition to an outline of the Forum's programme, it includes the evaluation of the Citizens' Forums, which was carried out by the Centre for TA, together with the Forum delegates. The Citizens' Assessment, as the Centre for TA intended, was supposed to address itself to the general public as well as to deciders in politics. It was seen by the Centre for TA as a decision support to supplement the experts' statements on the opportunities that genetic engineering offers for the *Land* Baden-Württemberg, which had been gathered in the first project phase. The judgement of the citizens differs according to the goal and field of application of genetic engineering. Whereas the use of genetic engineering for medical

Initialisation/Concept

Initiative by state government: exploration of chances for biotechnology in the state of Baden-Württemberg

Centre of TA: development of concept
- Phase I: expert opinions and expert workshop (what is possible?)
- Phase II: stakeholder workshop and Citizens' Forum (what is desirable?)

Concept approved by the advisory board of the Centre of TA

Selection of Lay People

Randomly selected from registration offices in three cities

4,000 invitations; a total of 194 citizens willing to take part

Citizens' Forum (Summer 1995)

8 Forums in the cities of Ulm, Mannheim and Weingarten (around 25 lay persons each)

Programme (four days)
- Lectures on genetic engineering (basic knowledge, chances and risks, regulation) given by the staff of the Centre of TA, by invited experts and stakeholders
- Discussion in small groups
- Questionnaires

Citizens' Assessment:
Summary of the results by the Centre of TA, approved by lay people

Dissemination of Results

Presentation of results at public hearings in the three involved cities

Presentation at a press conference by representatives of the lay panels

Presentation in the state legislature and at a meeting with representatives of state government

Figure 7.1 *Citizens' Forum on Biotechnology/Genetic Engineering*

purposes is seen positively, the use of genetic engineering in animal husbandry was rejected by a majority of participants, because they saw neither advantages nor a demand. With regard to the application of GMOs in the field of plant cultivation, the citizens distinguish between different goals. Breeding of plants in order to gain energy and raw materials for industry was advocated. The suggested goals, 'Improvement of Food Quality', 'Yield Enhancement', and 'Resistance to Pathogenic Agents and Herbicides' were rejected. A majority of the lay people demanded that production and sale of genetically manipulated food products be forbidden. Eighty-seven per cent were in favour of a general labelling obligation. The federal government should exert a strict controlling function over genetic engineering. It should avert dangers without risking future benefits. This also means encouraging alternatives to genetic engineering.

The following two points need to be considered when trying to assess the role of the Citizens' Forum.

Societal and Political Context

The first concerns the initiative's social and political contexts. At the time of the Forum, the focus of public discussion and technology policy had shifted. Biotechnology had entered the commercialisation phase. A number of newly established research centres and large firms had been engaged in the search for markets for newly developed biotechnology products, and the government was beginning to give up its passive, more reflective stance on risk issues and issues of regulation for a more active role: the development of markets, and the fostering of the industrial potential of genetic engineering. The aim was to improve the competitiveness of Germany's scientific research and economy. Biotechnology gained support from the federal government and also from the state government of Baden-Württemberg. Several programmes were initiated in order to promote new genetic industries.

In contrast to earlier debates on regulation (in the 1980s), environmental interest organisations had no great influence on politics in this phase of development; they gradually changed their position on genetic engineering from categorical rejection to a more differentiated standpoint.

After the establishment of the genetic engineering law in 1990 and an amendment of the law in 1993 (which partially lowered the legal barriers to research and development of genetically modified organisms), the vivid public debate on risks of genetic engineering, which had been broadly covered by the media, abated somewhat. Debate mainly went on in a 'sub-public' of critical experts and environmental groups.

From the early 1990s onwards, public debate on technology policy was dominated by the so-called 'industrial location debate', whereby biotechnology was seen as an important cornerstone of the future development of industry in Germany. A panel of experts on technological issues, the so-called 'Technology Council' (*Technologierat*) was established. It discussed, among other things, genetic engineering, stressing its economic potential for Germany and identifying a lack of public acceptance as a main problem for future developments. The Council recommended that this lack of public acceptance be tackled by an active promotion of public understanding of genetic engineering by government authorities and industries.

In this situation, the opportunities of the Citizens' Forum to influence or inform decision-making were restricted, because decisions on the central subject of the Forum – namely risk and safety – had already had been settled. The public debate on genetic engineering and biotechnology was going on, but the process of political decision-making already had come to a definite result: the genetic engineering law, which had just been amended and which was not a subject of political discussion at the time when the Citizens' Forum took place.

The mission and the design of the Citizens' Forum was obviously influenced by the fact that the political discussion at that time was dominated by the industrial location issue and by efforts of the political system to promote biotechnology industries as a means of fostering Germany's economic position, as well as by the tendency to see a lack of public acceptance of genetic engineering as a main obstacle in reaching this goal. This is illustrated by the following second point.

Citizens' Forum as an Adjunct of Industrial Policy?

The Citizens' Forum was part of a wider, comprehensive project called 'Biotechnology and Genetic Engineering as a Basis for New Industries in Baden-Württemberg'. This project was initiated by the Centre for TA, following a proposal by the state government of Baden-Württemberg's Ministry for Research, Trade and Environment. Its overall objective was to investigate Baden-Württemberg's potential and opportunities in the field of biotechnology. The Centre for TA submitted a concept to its Advisory Council. The concept's first phase focused on 'realistically determining the potentials of biotechnology in research and development as well as possible fields of application' (*Bürgergutachten*, 1995: 1). Its question 'what is possible?' was directed to research, while the question 'what is practicable?' was directed to business. The third question, 'what is desirable?', was assigned to be dealt with in two dialogue workshops with representatives from societal interest groups as well as in the Citizens' Forum with the lay panellists at its centre.

In the first phase of the project, assignments for a total of 15 expert opinions were given, which examined in detail the state of the art and the perspectives for genetic engineering in the emerging fields of application, as well as the general legal and economic framework. The results of these expert statements were evaluated during an expert workshop. Discussion of the hazards of genetic research was intentionally omitted here, because, in the project leader's opinion, it had already been discussed sufficiently elsewhere. Among the experts chosen, there were no exponents of a position explicitly critical of genetic engineering. In the final report on this phase of the project, the verbatim opinions of research scientists and (prospective) users, in other words, the persons chosen to staff the workshop, came through undiluted (over-regulation in Germany, too little acceptance, not enough support) (von Schell and Mohr, 1995).

The design of this part of the project led to criticism, e.g. from environmental groups. In a statement printed in the final report of the project, an environmental group criticised that in this project the prime concern was not a critical assessment of technology, but a 'maximisation of economic gains', because the question of environmental impact had been completely neglected (Faigle and Dölle, 1995: 44). The omission of the risk issue for the first expert phase of the project was justified by the organisers with the argument that the first phase of the project should aim at 'objective rationality, willingness to

learn and to come to an agreement, openness, and consensus' (von Schell and Mohr, 1995). It can be seen as a major problem of the Citizens' Forum that, at least implicitly, criticism of genetic engineering by groups, such as environmentalists, is brought into disrepute as being lacking in objective rationality. The societal value judgement is separated from the 'genuine' scientific discussion, and simultaneously, the discussion of genetic engineering's potentials from that of its risks.

Impacts

The Centre's evaluation report of the lay participants' assessment was presented to the public in 1995 in the three cities where the Forum had taken place. Around 10–15 per cent of the lay people involved were present at this presentation, as were city representatives, journalists from regional newspapers and, in some cases, the local representatives in the state legislature and in the lower house of the Federal Parliament (*Bundestag*). The citizens involved took this opportunity to reiterate their demands on the politicians present to take the results of the Citizens' Assessment seriously. The results of the Citizens' Forums were also presented at a meeting in the Baden-Württemberg state legislature and at a meeting with representatives of several ministries (the 'client' of the project). Furthermore, a formal public presentation was hosted by the Centre for TA in co-operation with the magazine *Bild der Wissenschaft*. The results of the Citizens' Forums have not been presented to the Centre for TA's Advisory Council, in contrast to those of the project's first phase. At the presentation in the state legislature, the 'subtle differentiation' of the participants' opinions was acknowledged by the representatives present. The question of labelling genetically engineered food products stood at the centre of interest. Some parliamentarians, however, questioned the 'representativity' of the Forum.

A formal connection between the Citizens' Forum and the process of policy-making existed insofar as it was commissioned by state government officials, and that the results were published in the form of a report and by means of presentations addressed to these officials. A transmission of the Forum's results into processes of political decision-making was, however, not discernible.

According to the project leader's information, a reference was made to the results of the Citizens' Forum and to the related demand for labelling genetically engineered food products in a subsequent debate on the subject of 'Novel Food' in the state legislature. The project leader stated that one result of the Citizens' Forums might be that the state government and its representatives in the Centre's Advisory Council are now more aware of this model of public participation, and have a more positive attitude towards it. The state government has taken up contact with the Centre for TA and has expressed its interest in organizing more Citizens' Forums. The project leader came – in a self-critical reflection of the procedure – to the conclusion that the first phase

of the project (benefits of genetic engineering) resulted in a rather moderate and reasonable, qualifying estimation of the economic advantages of genetic engineering, rather than the often exaggerated expectations that circulated during the (Industrial 'Location Debate'). This, however, had no effect on the state government's policy. The founding of a 'Biotechnology Agency' for Baden-Württemberg can – at least partially – be seen as a reaction to the results of the project's first phase. The Agency's purpose is to concern itself with increased support for founding new businesses, improved research and development co-operation, and promoting the establishment of information and advice centres. But its responsibilities also include tackling the so-called acceptance problem. For the Citizens' Forums, no comparable effect on politics could be ascertained.

The local and regional newspapers reported in great detail about the individual Citizens' Forums. The emphasis of their reporting was laid on 'participation'. The novel fact that citizens are heard on the subject of regulation of genetic engineering was acknowledged. The results of the assessment also featured prominently; above all, the demand for labelling genetically manipulated food products. Besides the regional reporting, long articles on the Forums also appeared in the *VDI-Nachrichten* (*VDI-News*; VDI: *Verband Deutscher Ingenieure*: Society of German Engineers) and in the TAZ (*Die Tageszeitung*; a left-alternative daily newspaper in Berlin). In the *VDI-News*, the balanced judgements of the Citizens' Assessment were put in the foreground. The participants had, above all, acknowledged the usefulness of the respective application, and then differentiated between possible uses of genetic engineering: which ones were to be rejected, and which ones could be accepted. The article in the *TAZ* took a critical view of the question of the political effects of the Forums. The concept of the project as a whole was criticised: the focus lay almost entirely on the economic advantages of genetic engineering (implicit slant: the intention is the promotion of acceptance). The Centre's director, responsible for the first phase of the project is quoted with regard to the motto of the first [experts'] project phase, 'A Chance For New Industries?' with the words: 'The most important news first: we could erase the question mark.'

Conclusion

Due to the aforementioned development of public debate and governmental policy in the field of biotechnology, as a result of which relevant decisions had already been taken, it is not a surprise that impacts of the arrangement on the public discourse and on political decision-making – even if the problem of measurement of impacts must be taken into account – are not visible. Not targeted to an actual decision-making process, the acknowledgement of the Citizens' Forum's results is scarce. It seems that the procedure of involving lay people in the Forum was referred to widely in the media and by representatives of the government. This might be due to the fact, that giving lay people a say in technology policy debates is unusual in Germany and that the govern-

ment experienced the procedure as such as a means to show their willingness to hear the voice of the public.

Discourse on Genetically Modified Herbicide-resistant Crops (Discourse GMP GE)

> *The so-called consensus theory is an invention of people who are all gifted polemicists. They link their desire for general agreement with the threat to label those opposed to them as malicious or foolish. Nowadays, we need to be doubly on our guard when we hear the resounding call for consensus. (...) What then happens should not be simply tolerated: the acceptance that was tacitly demanded before is now called for explicitly.* [Konrad Adam, FAZ 24.5.91]

In contrast to the social debate on genetic engineering, which goes beyond specific technological aspects to include general problems of industrialisation and technology development, the controversy on appropriate government control of the use of genetic engineering centres on the avoidance of dangers and provision for risk required by law. Biological risks of genetic engineering and measures to ensure biological safety are central to the protection of classic targets of legislation such as life, health, public safety and the environment. The discrepancy between far-reaching expectations and fears in the social debate on genetic engineering and the extensive limitation of government control of technology to safety considerations have led to increased expectations for TA on genetic engineering. Given the current state of the debate in a context of expanding use of genetic engineering, it has been variously assumed that the period of fundamental controversy is past. The original polarisation between fundamental support and opposition has, it was claimed, diminished to disputes over *specific* applications, so that the important thing now is to carry out concrete TA studies on specific fields of application.

As a result of such considerations, the TA project on herbicide resistance of cultivated plants through genetic engineering (HR project) was, in a manner of speaking, at the crest of the wave. It appeared to be both an expression of, and the drive for, an increasingly objective (meaning 'neutral' and 'rational' as well) debate dating back almost 20 years. However, the controversy about the amended law on genetic engineering that was passed in 1993 shows that the 'objective' label was somewhat premature. Proponents and opponents of genetic engineering and its 'deregulation' both showed an impressive tendency to emotionalise and moralise – making clear the difficulties of distinguishing between scientific arguing and political pleading when vital interests are at stake. Only shortly after the act came into force, the *Frankfurter Allgemeine Zeitung* (*FAZ*) newspaper wrote that 'the battle about playing around with genes' had quietened but the opposition remained. Here again, the course of the HR project provided confirmation.

The HR Project

Between 1991 and 1993 the TA discourse on genetically modified herbicide-resistant crops was organised by Professor van den Daele at the Wissenschaftszentrum Berlin (WZB), the biggest public institution for social research in Germany, in co-operation with Professor Pühler, Institute for Genetics of the University of Bielefeld and Professor Sukopp, Institute for Ecology of the Technical University of Berlin. Financial support was provided by the German Ministry for Research and Technology. The approach taken in this TA was based on the assumption that TA should *not merely* be a forum of experts at which the state of knowledge on the possible consequences of a technology is presented and evaluated. *In addition*, it was claimed that this TA process should be a discourse 'arena', in which the social conflicts related to the introduction of a new technology can be articulated and discussed in exemplary manner.

At a first glance, the HR project was indeed set up as discursive TA: there was to be neither any scientifically imposed restriction on the production of scientific opinions nor any normative restriction to controversial claims for specific decisions (van den Daele, 1991). The TA procedure was planned to be a 'discourse arena, reflecting the range of social conflicts involved in genetic engineering' (van den Daele, 1991: 39). The choice of participants was viewed accordingly. Instead of democratic political criteria for participation, use was made of discourse theoretic criteria; an attempt was made at qualitative representation of the debating positions in the specific area of conflict, in both socio-political and scientific terms (van den Daele, 1991).

Participants were selected so as to reflect all the interests and the positions of the ongoing political conflicts over new technology and to include the declared advocates and critics (representatives of industry and environmental groups) of the technology under consideration. 'The TA procedure was organised as a social process of ongoing communication amongst those present, in order to guarantee a dialogue between representatives of controversial positions' (van den Daele, 1995: 63). The procedure included a series of conferences, where the participants defined the scope of the study, discussed the results of 20 expert reports as well as any conclusions to be drawn from the reports (Figure 7.2).

As the practical implementation of the TA project itself has shown, the selection criteria were relatively uncontroversial. Ultimately, the basic principles of the planned approach satisfied discursive requirements, as the participants in the HR project were themselves able to bear influence on how the issues and the rules for tackling them were formulated (van den Daele *et al.*, 1990). Primarily this was achieved by setting up a small Co-ordinating Committee during the first conference, including three people from each of the 'sides' included in the process (representatives of the regulating authorities, the industry and the environmental associations), as well as the three organisers.

Furthermore, all areas of investigation were covered by experts from the relevant disciplines. So the total number of discourse participants varied between 48 and 60 during a three-year period.

Initialisation/Concept

Initiative by Scientific Institutions:	Discourse on the implications of cultivating herbicide-resistant crops
Wissenschaftszentrum Berlin/University of Bielefeld/ Technical University of Berlin	Development of concept since 1989, development of a proposal for the Start-Up Conference in 1991 over eight months in advance
	Co-operation between Social Science, Ecology and Molecular Biology, communication with external experts and stakeholders

Concept approved/funded by the German Ministry of Research and Technology in 1990

Selection of Participants

Selected by 'expert judgement' with regard to the societal conflict arena: between 48 and 60 representatives of regulatory authorities, research institutes, environmental and consumer associations as well as agricultural associations (NGOs), industry and trade associations (number varying within the three years of durance)

HR Discourse (1991–1993)

Two two-day evaluation conferences: first conference in 1991, second and final conference in 1993

Issuing a series of expert reports on numerous aspects of herbicide resistance technology: final determination of topics as well as of the scenarios to be considered in these reports after the first conference

Three one-day preparation workshops (1992): discussion of expert reports

Coordinating Committee: consisting of the three organisers plus nine representatives of participants (three from each 'side' – authorities, industry and environmentalists)

Dissemination of Results

Publication of the **expert reports** as WZB reports, publication of **final considerations and evaluations** *by the discourse organisers* (reflecting the discussions throughout the whole process) as WZB report and as a book publication, numerous **scientific contributions** by organisers and participants in a variety of journals. Relatively sparse **media coverage**

Figure 7.2 *Discourse on Genetically Modified Herbicide-resistant Crops*

As a result, a broad spectrum of the problems of modern technology development was considered, for example:

- the possible risks of transgenic plants;
- the toxicological and ecological effects of the use of non-selective herbicides;
- the future of genetic resources;
- the advantages and disadvantages for farming;
- economic and agricultural implications;
- the long-term safeguarding of world food supplies;
- the ethics of plant manipulation.

The overall orientation of the HR discourse remained 'technology induced' though.

Besides holding the discourse on HR technology itself, another primary goal of the project was the accompanying impact study on the project carried out by WZB. This study focusing on 'how perceptions of problems, arguments and patterns of conflict change under the influence of TA' (van den Daele *et al.*, 1990) already had a pathway marked out for it, as it was seen as an overall goal of the discourse project that approaches were to be sought that avoided both simple adaptation to innovative competition proceeding at its own pace, and also an unproductive block on further development. The accompanying research was guided by the hypothesis that objective rationality in dealing with HR plants was best reached through the social dimension (discursive processes). Scientific ambivalence would have to be 'bridged socially, i.e. through consensus' (van den Daele *et al.*, 1990: 14).

The contents of the TA procedure were largely determined by the contents of the 20 expert reports, which were published afterwards by the WZB Berlin. The organisers of the discourse recognised a tendency in discussions of the experts to concentrate on the assessment of (environmental) risks of genetically modified crops in the sense of a kind of prior regulative approval for submission to the market. Thus the discourse concentrated on possible damages caused by the HR crops and neglected or ruled out a trade-off of chances and risks as well as wider aspects, such as problems of further industrialisation of agriculture, which might be induced by HR crops.

At the beginning of the final conference in June 1993, the environmental associations announced their withdrawal from the procedure, stating that the technology-induced approach of the TA discourse had hindered a proper assessment of the HR technology (AbL, 1993). Instead of this, the environmental groups played for a problem-related approach, including the assessment of the need for HR crops and of agricultural alternatives to HR crops. Besides this, they criticised the conclusion drawn by the organisers from the discursive risk assessment as biased. The conclusion drawn by the organisers has been that the discourse procedure did prove that there is no substantial argument for HR-GMOs to bear particular risks (connected to the genetic modification) that are different from risks inherent to traditional techniques of plant breeding.

The first conclusions on the operation of discursive TA processes drawn from the HR discourse were produced with a significant amount of sociological terminology (Bora, 1993; Bora and Döbert, 1993). The formal stocktaking was a sober review of the initial hypothesis. It was claimed that the discourse had indeed forced the participants to stick to 'objective-rational' argumentation at the cost of strategic and 'political' arguments; thus the outcome of the discourse (as seen by the organisers): 'There are no particular risks of genetically modified crops' could be regarded as 'rationally proven'. However, a consensus had not been achieved. So the political core seemed to be disappointment at the political failure of a strategy of conflict resolution (van den Daele, 1994).

In contrast, the thesis advanced here is that the execution of the HR project involved a *confrontation of two incompatible sets of TA expectations* for which the 'discursive' approach constituted a flimsy bridge.

Discussion

At the second, the sociological, glance, the withdrawal of the environmental associations need not inevitably be interpreted as the failure of '*gains in rationality*' intrinsic in the process; nevertheless, it can certainly be seen as the failure of the *'intrusion' of the 'rational' result into the initial social conflicts*. Nor is it necessarily adequate to draw the conclusion of the WZB working group, namely that the environmental associations by their withdrawl tried to avoid their argumentative defeat. Instead, it could be claimed that, overall, the project was characterised by the conflict between a *strategic TA concept* and a *democratic* one, which coincides (and not accidentally) with the fronts in the conflict over genetic engineering itself.

As representatives of a democratic TA concept, the spokespeople of the environmental groups stated their position clearly (Gill, 1991; Kiper, 1993). The intention here was for pTA to influence explicitly the shaping of technology, in other words decision-making. Following this line, a point considered right at the start of the process was whether the participatory inputs required were compatible with the identifiable political return (Gill, 1991) – a legitimate tactical calculation, which was also related to the special conditions for participation by the organisations represented.

Participation by industry and government agencies will presumably also have faced a reflection on the reasons and interests that should lay behind their participation in such a process. Considerations of this kind are inevitable, and are not dependent on whether the process concerned is organised by political and administrative decision-makers or a discursive TA programme remote from the decision-making process. These groups of participants may be presumed to be representatives of a strategic TA concept, on the basis of a classification made by Bora and Döbert in the light of the 'discourse' typology they constructed (i.e. competitive rationalities of an expertise-oriented versus a policy-oriented TA concept). According to this, the participants from industry and government agencies should be generally viewed as supporters of HR technology, who also support technological and scientific and process-related standards of co-operation in the TA process with the goal of achieving cognitive preparation for political decisions (Bora and Döbert, 1993: 90). None of these participants is an adherent of a democratic TA concept directly related to decision-making. Indeed, how could it be otherwise with those who *already make* the decisions?

Restrictions on the 'freedom of action' of industry or government agencies would have removed the 'transactional basis' of the TA process, as one of the organisers would put it (see van den Daele, 1995). The non-binding nature of participation was also signalled by the fact that government agency representatives were not officially sent. In the context of prevailing law of genetic

engineering, the limitation to 'information orientation' sought here, not only has restrictive implications for the functions of the TA process in 'acting as a forum for technological policy conflict', it must also be seen as a *political* preference. This is because the existing structures of technology regulation are excluded not only from decision-making via TA but ultimately also as discursive issues. Seen in this light, the orientation towards 'a scientific type of discourse' is just as political as the 'political type of discourse'.

While the organisers of the HR project initially appeared to be representatives of a discursive view of TA, and this in many ways shaped the structures, it can be shown that the organisers were already involved in programmatic contradictions between a strategic and discursive concept, the elimination of which in practice actually led to a strategic orientation.

Impacts

Although the final result, according to which there are no specific risks when genetically modified crops plants are released, was welcomed by several prominent administrative as well as scientific speakers for quite a while, the societal resonance of outcomes remained rather small. Also, the media coverage of project results seemed to be sparse (there has, however, been no systematic analysis of media coverage). Only some German quality papers reported repeatedly. This fact might primarily be due to the demanding and complex proceedings of the project. In addition it could reflect the given regulatory situation in which the HR discourse was by no means related to any relevant political decision.

Seen from the present state in the use of gene technology (not only) in Germany, one could speculate that the message distributed by the herbicide resistance discourse has had long-term and rather sub-cutaneous effects. Besides the field of cloning and using human embryos, the debate on medical and agricultural use of GMOs indeed seems to be 'normalised' (see van den Daele, 2000). Even the German Greens no longer oppose this branch of 'business as usual', while questioning its social benefits and risks is still subject to a considerable amount of research. In this respect one of the environmentalists could still have been correct when he claimed in the very beginning of the HR discourse that the participating environmental associations would lose anyway – either in terms of missing influence or in terms of loosing a battle in the discourse arena.

Conclusions

Either of the discussed case studies highlight the relation of the participatory arrangement to its wider social and political context as a central problem of pTA. It is obvious that the political role of pTA is restricted when important political decisions have already been settled – as was the case with the

Citizens' Forum. Moreover, the case studies show to what extent the tenor and level of societal debate as well as interests dominating the political process can interfere with the mission, the design and the course of the participatory procedure. The Citizens' Forum partly suffered from being designed as part of a larger TA project that was politically commissioned to explore the industrial opportunities of modern biotechnology. The discourse on genetically modified crops was designed as an attempt to establish a space for 'rational' deliberation on risk issues. The discursive procedure did, however, not succeed in ruling out general arguments on the doubtful agricultural use of GM plants held by environmental groups (which led to their withdrawal from the procedure). In addition, the discourse procedure's relation to decision-making was unclear, and did not meet the expectations of the involved environmental groups. So their suspicion, that while spending months on arguing in the discourse procedure decisions were taken elsewhere (by industry), remained as a burden to the whole process.

It might well be that the question of pTA's relation to decision-making is especially a problem in a country like Germany where participatory arrangements in technology policy are still rather innovative and where debates on new technologies used to be relatively adverse. However pTA, as TA in general, has by definition the mission to somehow effect decision-making processes. Apart from this, giving a voice to people or groups that normally are not involved in technology policy decision-making necessarily raises the expectation that being involved in pTA makes a difference. So the relation of pTA to the societal and political context and to established relations of power will always be a crucial and continuously debated question with regard to the political role and function of pTA.

Chapter 8

The Netherlands: Seeking to Involve Wider Publics in Technology Assessment

Case Studies

- *Public Debate on Genetic Modification of Animals 1993 (GM Animals NL)*
- *The Sustainable Menu 1994 (Sustainable Menu NL)*
- *Crop Protection and Environmental Concern: Gideon Project 1995–7 (Gideon NL)*
- *Consumers' Aspects of Novel Protein Foods 1993–6 (Novel Food NL)*

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Participation in Dutch Technology Assessment – a Historical Overview

Four case descriptions of participatory technology assessment (pTA) projects are at the heart of this chapter. They all exemplify early experimentation in the Netherlands with pTA. The specifics of the way in which participation in technology assessment developed and why these activities were undertaken can be understood from the history of participation in Dutch political culture in general, and from the ongoing debate on a broadening of the basis for decision-making on technology and science in particular.

Until the 1970s, Dutch society was organised along four socio-cultural 'pillars': Protestants, Catholics, socialists and liberals (Lijphart, 1968). Each pillar loosely united a group of people with respect to almost every sphere of life. Contacts between the various pillars were limited to the elites involved in political decision-making. The fact that each pillar represented a minority in

1 Wilma Aarts (SWOKA) wrote the GM Animals NL case study.
2 Anne Loeber (University of Amsterdam) is the author of the Gideon NL case study.

Dutch society encouraged these elites to develop a political culture of accommodation and pacification. This pragmatic tolerance in the face of diversity formed the basis of Dutch corporatism and is still regarded as a deeply entrenched trait of Dutch political culture. In the mid-1960s, a call for democratisation and participation went hand in glove with a growing distrust in the establishment. In the course of the 1980s, several new interest groups (such as environmental organisations) gained a permanent place at the negotiation table. In this way the diverse grassroots-based societal debate that started in the 1960s became partly institutionalised by means of a broadening of the corporatist structure, a situation that is widely referred to as the 'Dutch *poldermodel*.'

The dynamics in the field of energy policy form an illustration of this development. In the 1970s, the planned introduction of nuclear power by the electricity sector led to a fierce public controversy. In response to this political turmoil, the government decided to organise a Broad Societal Debate around Energy Policy (BMD). This broad societal debate ran from 1981 to 1984 and gave all Dutch citizens the opportunity to express their opinion about the future of energy production and consumption. This unique public participatory event in Dutch history took away much of the direct confrontation between the anti-nuclear activists and the establishment (Cramer, 1990: 158). It stimulated a more co-operative attitude between various parties within the energy field. At the same time, the broad societal discussion left the Dutch public with a poor impression of public participation. Although the public clearly rejected the nuclear power option, the government still decided to go along with nuclear energy. The public's opinion did not incite a change in public policy. An unexpected event, however, did: in the week of the planned parliamentary debate on the issue, the Chernobyl nuclear reactor accident (in May 1986) at one stroke sidetracked nuclear power as a politically viable electricity production method in the Netherlands.

As was the case with new forms of energy production, other scientific and technological developments led to public debate in the 1970s and 1980s; most explicitly the development of genetic engineering. Such debates led the Dutch government to reflect on how to involve a broader public in opinion forming and decision-making. This reflection resulted in a policy paper of the Ministry of Education and Science (1984) on the integration of science and technology in society. The paper proposed the establishment of an organisation to disseminate information on science and technology (PWT) and a Dutch TA organisation (NOTA). Both were established in 1986. In order to identify key issues and clarify basic visions within a certain societal field, NOTA regularly organised workshops with experts and stakeholders. An evaluation in 1993 concluded that NOTA was too scientifically oriented and recommended the organisation to strengthen its role in stimulating debate. As the mission shifted, the organisation's name was changed to the Rathenau Institute. The new mission created the opportunity to experiment with the participation of citizens within its TA projects.

Inspired by the experiences in Denmark, the Rathenau Institute, together with SWOKA, a consumer-research organisation and PWT, in 1993 organised

the first Dutch consensus conference on genetic modification of animals. In the same year, the Platform on Science and Ethics was set up.[3] Under this banner, the Rathenau Institute tried out several methods to stimulate public participation and debate on normative issues (see e.g. Van de Poll 1997). The expertise on public participation built up by the Platform has become a regular part of the Rathenau Institute's way of performing TA. The later TA projects Clones and Cloning (1998–1999) and Replacement Medicine (2000–2001) serve as examples.[4] In both projects, so-called parallel citizens' panels were set up (Van Est, 2000). This means that the lay panel is organised as part of a long-term TA project that also involves classical TA methods, like studies and workshops.

The Rathenau Institute has also elaborated on new methods to organise interaction between experts and stakeholders. In 1995, the so-called Gideon project involved the active participation of experts and stakeholders in an attempt to set up a dialogue (or rather a 'multi-logue') about sustainable crop protection. The project's aim was to provide an overview of existing views on (future) sustainable crop protection methods, and to provide Parliament with insight into the opportunities and threats for realising such a production mode. To achieve this objective, the Rathenau Institute chose to try out an *interactive TA approach* that involved people from the agricultural sector, the field of plant improvement, pesticide and retail industry, and consumer and environmental organisations (Grin *et al.* 1997). At present (2001), the interactive TA approach is being further explored and employed in the project on sustainable water management.

The Rathenau Institute is by no means the only institution that organises pTA activities. Other organisations, including the Institute for Public and Politics and Infodrome, with either publicly appointed or self-imposed tasks with regard to technology assessment and public debate, do so as well. In order to provide the reader with an accurate impression of the variety of experiments in the Netherlands with participation in TA, we have selected four cases. To ensure a sufficiently wide view on the Dutch methodical 'landscape ' on the one hand, the projects' methods range from public debate to stakeholder interaction. To provide a certain amount of coherence, on the other hand, the projects all focus on (bio)technology and food production. Two of the projects were conducted by the Rathenau Institute, one by the Netherlands Committee on Sustainable Development (NCDO), and one by DTO, a governmental Interdepartmental Research Bureau on Sustainable Technological Development.

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3 In 1991 the Minister for Science and Education had pleaded for the organisation of debates on ethical aspects of science and technology. The Rathenau Institute was asked to take up this task, and did so by co-operating with a number of advisory bodies, like the Health Council, within the Platform on Science and Ethics.

4 A description in English of the debate on cloning in the Netherlands as organised by the Rathenau Institute can be found in *Clones and Cloning: The Dutch Debate* (Rathenau Institute, 1999). Information on the project Replacement Medicine is only available in Dutch, e.g. in *De toekomst van orgaanvervanging: het tekort voorbij?* (Rathenau Institute, 2000).

The first project described below involves a public debate on the genetic modification of animals. This project was organised by the Rathenau Institute along the lines of the Danish 'consensus conference'. The second case also presents a public debate, on the topic of food, organised by the NCDO. NCDO's remit is to stimulate public debate on sustainability; it generally focuses on topics that have a strong technological component. The third case is the aforementioned Gideon project. The last case focuses on the participatory project called Future Visions of Consumers, which formed part of a larger project on novel protein food. This project was organised by DTO.

Public Debate on Genetic Modification of Animals (GM Animals NL)

In 1993, the Netherlands were the first to import the format of the 'consensus conference' from Denmark (see Chapter 6 on Denmark). Other European countries would follow. The conference dealt with the question of whether genetic modification of animals should be allowed. It was called in Dutch *Publiek Debat* (Public Debate). Typical for the Public Debate was that the lay panel was not obliged to reach consensus. The aim of the debate was to clarify the spectrum of opinions that existed among citizens.

In the early 1990s, NOTA wanted to experiment with public participation. Its Board, however, saw a consensus conference as an activity to inform the public, an activity it considered the domain of PWT rather than NOTA. When NOTA decided to co-operate with PWT, the Board agreed on the organisation of a Public Debate.

The goals of the Public Debate were primarily experimental and methodological. Genetic modification of animals was selected as a topic for the Public Debate, because it had led to a public controversy and had received considerable media attention. In the late 1980s, an intense debate had started on the ethical issues associated with biotechnology and animals. In response, the Minister of Agriculture and Fisheries had set up an advisory committee to advice him on how to regulate the research on transgenic animals. The Dutch debates centred on the activities of the Dutch biotech company GenePharming, which in 1992 'created' Herman, the first transgenic bull. Herman's birth led to a lot of media attention. NOTA at that time played a role as mediator in structuring the debate, by setting up studies and workshops to scrutinise the ethical arguments and opinions of various stakeholders and experts. Consequently, the topic of genetic modification of animals clearly fitted the TA activities of NOTA in the field of biotechnology. Moreover, it also fitted the information activities of PWT, which wanted to introduce the subject to Dutch citizens in order to stimulate and broaden the debate on biotechnology. The Public Debate was carried out with the help of SWOKA, which was interested in experimenting with public participatory methods.

In line with its earlier activities, NOTA wished to gain insight into the way lay people assess such a complex technological and ethical issue, and whether the perspective of lay people is similar to that of the ethical experts and interest groups. One objective was to organise an open dialogue between experts and non-experts on the latter's questions, doubts and expectations. The Public Debate was to identify relevant questions, insights and perspectives on genetic modification of animals. The organisers wanted politicians and policy-makers to take into account the opinions of citizens. Although the organisers had no practical experience with setting up a consensus conference, the expectations were rather high.

The Public Debate

The Public Debate closely followed the Danish model of the consensus conference. Members of the lay panel were recruited through advertisements placed in (local) newspapers across the country. People who wanted to join had to send a letter to apply for participation. From the 111 applicants, a panel of 16 citizens was selected. After the lay panel was formed, it prepared itself during two weekends for the actual Public Debate.

Before the first preparatory weekend, the participants received a collection of popular and scientific articles on genetic modification of animals. The weekend included introductory lectures by a biology teacher, a doctor, a biologist and an ethicist. The panel prepared questions for the speakers. The participants role-played the Public Debate during the preparatory second weekend. Furthermore, they selected questions and experts for the final debate.

To conform to the format of the consensus conference the Public Debate 'Genetic modification of animals, should it be allowed?' lasted three days. The format was changed a little to provide extra room for discussion. On the first day, there were 12 short presentations that provided a broad scope of information.[5] After three presentations, the lay panel and the audience could ask questions. The audience could hand in written questions as well.

The audience consisted of about 150 persons (including 2 Members of Parliament, 14 people from government, 93 people who were engaged in the debate on genetic modification of animals, 6 journalists, and 20 ordinary citizens). The Public Debate was freely accessible, but people from relevant business, interest groups, professional, branch, church and scholar organisations, government, advisory councils and committees, Parliament and the scientific bureaux of political parties were invited explicitly. On the evening of the first day, the citizens' panel selected 15 questions from the 23 that the audience had handed in.

During the second day, the citizens' panel put its questions to the experts. After the discussion, the lay panel withdrew to formulate its final declaration.

5 The presentations addressed the state of the art of the technology, future expectations, patents, animal welfare, the intrinsic value of animals and moral barriers, decision-making and international agreements, research policy, alternatives, risks and abuse of the technology, and its societal effects.

In this process, a mediator assisted the panel. The panel members answered various questions in order to determine their opinion on genetic modification of animals. There appeared to be two standpoints, so the panel split up in a majority (nine members) and a minority group (six members), who each contributed to the final declaration. It took all afternoon and evening to write the final declaration.

The minority group argued that, in principle, genetic modification of animals should be allowed. It emphasised the potential positive contribution to health care and favoured research to increase insight in the human genome. The majority standpoint pleaded for a moratorium and argued that genetic modification of animals should be forbidden. It made an exception for generally accepted scientific aims. This group was surprised by the speed of scientific development. It argued that experts were insufficiently clear about what to expect in the future from genetically modifying animals, and what the goals of the research are. The majority felt that economic interests prevailed too much, and that insufficient attention was paid to animal welfare, and to alternative research paths. Finally, they concluded that political decisions that had already been taken were not implemented and that decision-making on genetic modification was lagging behind technological development. As a consequence, the final declaration consisted of two prudent answers to the question of whether genetic modification of animals should be allowed. These answers amounted to what in the Dutch political debate is generally referred to as the 'Yes, provided that' standpoint (the minority view) and the 'No, unless' standpoint (the majority perspective).

On the third day, the lay panel handed its final declaration to the experts. After the presentation by two members of the lay panel, the experts and the audience had the chance to put questions to the lay panel. After a final discussion, the panel declaration was handed to a Member of Parliament (MP). The lay panel insisted on having an evaluation meeting. The organisers agreed and organised a comeback meeting a few months later. The lay panel turned out to be satisfied with the content of the Public Debate, which in their opinion had addressed all aspects of the issue (Hamstra and Feenstra, 1993). The panel criticised the long and excessively precise expert answers, and unnecessarily defensive presentations. Some members had experienced difficulties in bringing forward their opinion during the debate. They had felt the need for some training in debating.

A month after the Public Debate, NOTA sent the final declaration to Parliament together with its own analysis that contained a summary of the debate and the lay panel's questions. The Public Debate was covered in some 28 newspaper articles. The relative lack of media attention was partly related to an unfortunate political timing. The birth of the bull Herman, during the preparations of the Public Debate, had created media attention, but had also accelerated the political decision-making process. At the time of the Public Debate, Parliament had already discussed and decided on these issues. Since the lay panel's two views reflected to a large extent the various standpoints within the debate in Parliament, the Public Debate had no political implications. With respect to the strategy of NOTA, the Public Debate signalled the

start of experimenting with public participation and expert and stakeholder interaction within TA projects.

The Sustainable Menu (Sustainable Menu NL)

Since 1994, the Netherlands Committee on Sustainable Development (NCDO) each year organises a series of debates to stimulate opinion forming on sustainable development. The topics cover technological, political and social issues. In 1996 a series of eight so-called National Sustainability Debates was held within a connected period of four days. One of these focused on the 'sustainable menu'.

NCDO: Platform and Debate Coordinator

Interestingly, NCDO is both related to the Government and NGOs. Its Board consists of 21 representatives of societal or non-governmental organisations (NGOs). These include religious and humanist organisations, environmental organisations, development co-operation organisations, as well as trade unions and organisations that focus on the interests of youth, women, immigrants, employers and consumers. On behalf of the government, NCDO carries out various government programmes and co-ordinates public debate on North–South issues and sustainable development. The NGO's delegate NCDO to represent them in international forums, such as the Committee of Sustainable Development of the United Nations (UN). NCDO also acts as mediator between government and societal organisations.

One of the governmental programmes that NCDO carries out is the Programme National Debate Agenda 21. This programme is meant to embed the action plan of the UN climate conference in Rio of 1992 in Dutch society. The National Sustainability Debates take place within the framework of the Agenda 21 Programme, in which the relevance of participation and public debate is recognised. Participation is considered essential for the development of a policy on sustainability that people are willing and able to implement. Through the involvement of NGOs, businessmen, scientists and other societal actors in the selection, definition and debating of issues, the Sustainability Debates are thought to foster the societal support for sustainable development, also among the general public. Further, the debates aim to generate new ideas and enhance co-operation between the various parties. They are also directed at shifting government policy, strategies of firms and citizens' actions into a sustainable direction.

The Sustainability Debate on the Sustainable Menu

The selection of issues and preparations for the National Sustainability Debates takes place in an annual cycle (see Table 8.1). First, potential issues

for the debates are gathered and selected by employees of NCDO. Ideas may be personal or stem from NGOs or the Agenda 21 Programme. Topic selection is guided by the following criteria:

- The issues should link up to themes that have been discussed in the annual meeting of the Committee on Sustainable Development of the United Nations of that year.
- Issues must be relevant for the board members of NCDO.
- Issues must be interesting for, and move, the public.
- There should be a balanced spread over societal sectors with structural sustainability problems.
- If possible the issues should be approached from an international perspective.

NCDO selected eight issues. Among these issues were climate change, the use of chlorine and the growth of flight traffic. The overarching theme was 'creative democracy'. The issue of sustainable food originated from Agenda 21, which covered patterns of consumption and sectors of production. NCDO decided to dedicate debates in subsequent years to different domains of consumption. For 1996 the domains of clothing and fashion and food consumption were selected.

After selecting the issues, NCDO invites journalists to explore these issues in the form of popular articles. The journalist is asked to present not only scientific insights and the opinions of government and business, but also those of critical interest organisations and experts. The journalist, who explored the subject of a sustainable menu, wrote quite an 'alarming' article. Against NCDO's wishes, the article put an emphasis on the production side of the food chain rather than on the consumption side. The article argued that the production of food is increasingly submitted to complex techniques, that industrial agriculture is based on monoculture and the extended use of chemicals, which leads to environmental damage and the reduction of bio-diversity. The reporter described genetic manipulation as the next step in the industrialisation of agriculture and stressed the human risks and economic interests involved in this development. The journalist presented organic agriculture as the best alternative from the perspective of sustainability.

Table 8.1 *Set-up of the Sustainability Debate*

Study or debating activity	Result
Selection of issues	Selecting a list of eight topics for a series of sustainability debates; one of the topics is the 'sustainable menu'
Article	Journalist writes an article that gives background information and serves as a discussion paper for the preparatory workshop
Preparatory workshop	Formulation of propositions for the debate
Sustainability Debate	Lively public discussion between experts and politicians on the 'sustainable menu'
Book	Publication of article in NCDO book *Creative Democracy*

The article formed the input for a preparatory workshop that took place in February 1996. The 25 participants included representatives of interest organisations and business, and included experts that had been interviewed by the author of the article. Scientists in the fields of technological and agricultural development, organic agriculture, and Third World studies were invited. Organisations such as the Alternative Consumer Organisation, the Information Bureau on Food, environmental organisations and the Interdepartmental Research Bureau on Sustainable Technology Development (DTO) attended the workshop. The workshop's objective was to formulate questions and propositions for the debate on 'the sustainable menu'.

The preparatory workshop consisted of three sessions. First, an inventory was made of all possibly relevant sub-themes. In a second round every participant put forward one proposition. In the third session four propositions were selected:

- Modern biotechnology may contribute considerably to sustainable food production.
- The Dutch Government should provide considerable subsidies to enable farmers to switch to organic agriculture.
- Export agriculture and international trade remain necessary to develop the Third World.
- The use of modern biotechnology and chemicals in food production as well as the control of food should be based on the precautionary principle.

The series of sustainability debates took place in April 1996. Each debate had the following set-up. First, two politicians interview representatives of NGOs, business and science (2 x 10 minutes). Then politicians get 10 minutes to prepare a policy declaration. In the meantime, the audience is able to ask the members of the panel some questions. After this, the politicians present their policy declarations (2 x 5 minutes). Thereafter, there is time (40 minutes) for a plenary discussion. This design is meant to allow for a high tempo, highly informative debate.

In the debate on sustainable food, an MP from a small left-wing party and a member of the First Chamber from a large liberal party interviewed the panel, which consisted of delegates from an animal welfare organisation, an alternative consumer organisation, the food processing industry and DTO.

After the policy declarations, all people were allowed to join the debate. The discussion that followed touched on the various topics presented in the article and proposed in the workshop: organic agriculture, genetically modified food, regional food production, safety and animal well-being. Different debating strategies were used. The panel member from the food processing industry tried to narrow the argument, and confine it to areas of scientific certainty and health risks. The representative of the alternative consumer organisation tried to widen the discussion. Together with the left-wing politician, he emphasised the importance of animal welfare and

uncertainties and risks, such as the potential risks for people related to a loss of bio-diversity, and the unknown risks of gene technology.

The journalist's article was published in the NCDO book entitled *Creative Democracy* (3,000 copies). The book has been distributed among the attendants of the debates and sold in bookstores. The article was also published in a magazine, and a short report of the debate itself was published in the NCDO newsletter. There was no other publicity related to the sustainability debate on the sustainable menu. According to the organisers, this was due to the fact that the subject was not a 'hot issue' at that time, nor was it related to current politics.

Although the debate was related to the governmental programme on Agenda 21, there was a very weak connection to the policy-making process. The debate had no clear impact or consequences in this field. This is likely due to the lack of follow-up activities. After one annual series of debates is finished, the preparations for the next year start up. As a result of the large number of debates, their duration and speed, the preparatory workshops and the debates become rather transitory.

NCDO has recognised this weakness. Although the format has changed little, there has been a clear shift in goals. The objective of stimulating societal debate has been weakened, while that of influencing policy has come to the fore. Since 1998, all countries that have adapted Agenda 21 have to develop a sustainable strategy for 2002. The series of sustainability debates are used as an instrument to generate recommendations for such a sustainable strategy 2002. In order to highlight the policy implications of the debate an outside expert is asked to draw conclusions at the end of the debates. An outsider is invited to formulate these from the debate. In addition, NCDO has decided to organise follow-up activities that build on the ideas that have been produced within the debates. NGOs and others are invited to join these initiatives. It can be concluded that the sustainability debates have become part of a larger strategy aiming at policy impact.

The Gideon Project on Sustainable Crop Protection (Gideon NL)

On a related topic, but of an entirely different nature, was the Gideon project organised by the Rathenau Institute. Starting from the issue of crop protection agents, the project focused on the potentiality for drastic change in the current agricultural practice in the Netherlands.

Crop protection agents have contributed much to the success of Dutch agriculture since the Second World War. Gradually, however, it has become clear that the heavy use of crop protection agents, such as pesticides, herbicides and fungicides, has negative environmental impacts, and also leads to agricultural problems. In 1990, the Dutch Government formulated a multi-year plan for crop protection. One of its goals was to reduce the dependence of agricultural practice on chemical pesticides. The plan covered a ten-year

period. Halfway, an evaluation was planned, which was to be extensively discussed in Parliament. In order to provide MPs with background information on crop protection from the perspective of sustainable development, the Rathenau Institute launched a project on sustainable crop protection.

The project, dubbed Gideon (a Dutch acronym for Crop Protection Suitable for Sustainable Use and Healthy Economic Development in the Netherlands) took a comprehensive view of the issue of crop protection. Instead of limiting its scope to the subject of component substitution or to the technical aspects of pesticide application and emission reduction, the project focused on the production methods and organisational and institutional aspects of the Dutch agricultural practice as a whole.

A preliminary study showed that various stakeholders had different ideas on what the goal of reducing the dependence on pesticides meant and how this objective could be attained. The Rathenau Institute wanted to make these views more explicit and felt the need to look for a shared view on pest control. Clarifying various perspectives and looking for shared visions could guide evaluations of developments in the field of crop protection. In order to provide Parliament with an insight into the opportunities and threats for realising sustainable crop protection, the project was set up as an 'interactive' TA that involved a large variety of stakeholders.

The project ran from February 1995 to February 1997. It was managed by the Rathenau Institute and carried out by a group of researchers with various disciplinary backgrounds. In total, about a hundred people participated. An advisory committee, comprising a wide range of stakeholders, frequently discussed the project's proceedings. The Gideon project consisted of various activities (see Table 8.2). A key characteristic of the methodology was that both policy options and problem definitions were being discussed. Moreover, the support within the field for the findings and results as formulated by the project team was constantly checked through interviews or debating events.

The in-depth interviews with people from the agricultural sector, plant improvement, the pesticide and retail industry, and consumer and environmental organisations provided an accurate overview of the current problems and the barriers for solving them. However, they resulted neither in innovative solutions to overcome these barriers, nor in answers addressing a long-term perspective. Therefore, a future-oriented workshop was included in the project, in order to create an analytical space in which creative views on the issue might emerge. The so-called 'future perfect' method was employed, through which the participants were asked to fantasise about their preferred future business in agriculture.

The workshop resulted in three 'future visions ' which were subsequently linked by the project team with the options generated during the two interview rounds. The result was put up for discussion in a work conference. Participants were invited to indicate the degree to which they saw the future scenarios as realistic, desirable and contributing to sustainable crop protection. Most participants considered the 'ecological crop protection' scenario not to be viable and

Table 8.2 *Set-up of the Gideon Project*

Study or debating activity	Result
Preliminary study	Insight into state of affairs in field of crop protection Overview positions of relevant actors
Interview round 1	Insight into barriers and options for sustainable crop production Project team drafts 15 options
Interview round 2	Check on support for 15 options Project team reformulates options
Future-oriented workshop	Formulation of scenarios for Dutch agriculture Project team elaborates on three scenarios
Work conference	Discussion of and check on support scenarios Drafting of two scenarios: 'chemical refinement' and 'system-oriented prevention'
Four case studies	Check on implications of 'system-oriented prevention' scenario Project team drafts final report
Open day	Discussing and checking support for final report Publication of final report Drafting report to Parliament
Oral presentation	Presenting results to Parliamentary Committee on Agriculture

realistic and it was dropped accordingly. The other two scenarios – 'chemical refinement' and 'system-oriented prevention'– were amended and elaborated. According to the '*chemical refinement*' scenario, sustainable crop protection can be reached by optimising the application of chemical pesticides and by further amelioration of the environmental quality of pesticides. This implies, for example, rapidly degradable pesticides, low doses, careful application of chemical means (whenever possible), application of biological and mechanical means of weed and plague combat, early detection of diseases and plagues and the use of disease and plague-resistant or tolerant crops.

The '*system-oriented prevention*' scenario was more far-reaching in terms of change. This scenario focused on optimising agricultural practice, in order to prevent as much as possible the occurrence of diseases, plagues and weeds. Crop protection in this perspective is part and parcel of environmental care. This scenario implies a careful decision-making process on what is cultivated where (to select crops that best suit the local soil and climate), more crop rotation, a well-balanced use of nutrients, a broader use of disease and plague-resistant varieties, mixed cropping, and increased operational hygiene. Four case studies were carried out to study in more detail the implications of this scenario.

The draft version of the final report was put up for discussion during a public meeting, called an 'open day'. At this meeting, a great number of people were invited in order to comment on the findings. To the project team it provided an opportunity to check how the report would be received among a wider audience. The discussion took place on three themes: crop protection policy, environmental objectives, and agrarian management.

The thus amended final report formed the basis for the Rathenau Institute's report to Parliament. The Institute was faced with two points of severe criticism, concerning the lack of 'novelty' of the findings and views, and concerning the applicability of the policy suggestions. The first point of criticism was addressed by stressing the bottom-up process that had led to the report. With the help of members of the advisory committee, more concrete suggestions for governmental policy were formulated.

Although it is hard to 'decipher' the direct effect of the Gideon project on the policy process, there are reasons to believe that there was some impact. Although the project has been mentioned in parliamentary debates on three different occasions, there has been no concrete impact in the sense of direct changes in legislation or funding. Due to the way the information has been compiled and processed, the project, however, seems to have played a legitimising role for political decisions. In addition, the project also seems to have had an 'enlightenment' role in the policy process. When quoting the Gideon project, the Minister of Agriculture put the concept of 'reducing the dependence' on [chemical] pesticides in line with the notion of 'preventing plagues and diseases' (Letter from the Minister for Agriculture to the Second Chamber of Parliament, 1996–1997, 21 677, no. 33). It is the first time, judging from documents, that this concept has been made concrete in this way.

Also in later documents, the Ministry of Agriculture recurrently phrases the objective of the reduction of dependence in these terms. This effect might be ascribed to processes of learning by the research and policy institutes that participated in the Gideon project. Since some of the institutes are also involved in the preparation of future policy plans on crop protection, they function as a clearinghouse of information, translating the insights from the project (among others) into policy recommendations. All in all, it seems plausible that even though not directly via parliamentary debate, the Gideon project has had an impact on the policy process, through 'knowledge creep' and learning by the organisations that participated in the project.

Consumers' Aspects of Novel Protein Foods (Novel Food NL)

A final project discussed here focuses on consumer aspects of future novel protein foods, abbreviated to 'TvC'. In 1993, the Dutch Government installed an organisation to explore the opportunities for sustainable technological development. The objective of this Interdepartmental Research Bureau on Sustainable Technological Development (*Duurzame Technologie Ontwikkeling*, DTO) was not to influence technology development as a whole, but to illustrate the feasibility of sustainable technological development paths. Accordingly, the projects carried out by DTO were named Illustrative Processes (IP).

One of the programme's projects was an analysis of the possibilities for developing food products on the basis of non-animal protein, so as to reduce

the environmental burden associated with meat production. This project lasted from 1993 to 1996. The project's main objective was to illustrate the feasibility of Novel Protein Food (NPF) development in such a way that third parties, like industry, research institutes, policy-makers, consumers and environmental organisations, would continue to stimulate that development after the illustrative process had come to an end. To that end, the involvement of some large companies, including Unilever and Gist-Brocades, was considered crucial for achieving the desired follow-up. The project had to result in an R&D portfolio for NPF product development for the mid-term (5–20 years) and the long term (20–40 years). These products had to lead to a reduction of the environmental burden associated with meat production and should be acceptable for society and consumers, technologically feasible and attractive to producers and distributors.

The illustrative process involved research into five aspects of NPFs: technical, environmental, macro-economic, business-economic and consumers' aspects. The research activities regarding these topics were contracted out to several institutes. All clusters of research activities were conducted more or less simultaneously to ensure that the output of each could serve as input for other clusters. A project team coordinated the interaction between the research groups.

An advisory committee commented on the contents and progress of the project. The committee consisted of ten people active in NPF-related fields. The committee provided an opportunity to involve important third parties in the project. It proved difficult to find environmental organisations willing to join the advisory committee; these organisations feared that their involvement would be seen as an approval of developments that might only be in the interest of the industry and might possibly lead to little environmental gain. Consequently, apart from the major consumers' organisation in the Netherlands, no NGOs were represented in the advisory committee. They became involved in the project by participating in the research on consumers' aspects.

The research on consumers' aspects of NPFs was assigned to SWOKA. This institute employed an in-house developed procedure dubbed 'future visions of consumers' (*Toekomstbeelden van en voor Consumenten*, TvC) (Fonk, 1994). This method is participatory in character and tried to clarify the perceptions of consumers concerning the new foodstuffs as described by the technologists in the NPF project. The NPF project offered the first opportunity for the TvC procedure to be put into practice. SWOKA hoped that the TvC would enhance the chance that relevant consumer aspects would come to bear on the design of NPFs.

The TvC procedure consisted of various research and debating activities (see Table 8.3). First, an exploratory desk research was conducted concerning consumers' aspects of meat and meat substitutes. Subsequently, some 20 in-depth interviews were held among consumers (ranging from vegetarians to 'enthusiastic carnivores') in which descriptions of vegetarian foodstuffs – provided by the technologists – served as a starting point for discussion. The

Table 8.3 *Set-up of the TvC Procedure as Part of the IP-NPF*

Study or debating activity	Result
Preliminary study (including interviews)	Qualitative information on consumers' perceptions with respect to meat and meat substitutes
Survey (n = 1,056)	Quantitative information on consumers' perceptions with respect to meat and meat substitutes
Analysis session 1	Overview of consumers' aspects thought relevant by participants
Analysis session 2	Estimation of relevant future trends in consumers' behaviour Assessment of NPF product examples (on the basis of product descriptions)
Desk study	Information on demographic trends and relevant developments
Analysis session 3	Analysis and assessment of future NPF consumers (relevant age groups, family composition etc.) in relation to product types and 'consumption moments' Overview of claims, concerns and issues Final statement (= end result of TvC procedure)

results of these interviews formed the input for a statistically representative survey among Dutch consumers (n = 1,056) on the consumption of meat and meat replacements. Its results gave information on the motives, associations, norms and values that bear on the consumers' decision to buy meat substitutes.

The combined findings served as input for the three participatory analysis sessions. In these sessions, technologists, marketeers from business firms, and representatives of societal organisations and governmental bodies (amounting, in total, to an average of 20 participants per session) met to discuss the consumers' aspects of NPFs. The aim was to develop a shared view on consumers' aspects of NPFs based on the perceptions the participants have of the 'future consumer'.

The participants had been asked to fill in a questionnaire in advance of the first meeting. The answers to the questionnaire were thought to represent a participant's initial image of consumers' aspects with regard to future consumers of NPFs. To allow for an educated response, a description of possible NPFs was enclosed, as well as results of the in-depth interviews and the survey. The individual perceptions formed the central input for the first meeting. Each of the three actor groups was asked to assess various aspects and criteria concerning NPFs. It was expected that an 'actor group-dependent TvC' could be formulated. However, the results per actor group were found to be too diverse to construct a shared image of consumers' aspects. Yet, the exercise did result in an overview of the consumers' aspects which the various actor groups thought relevant with regard to meat consumption and meat substitution. An estimation of the extent to which the proposed NPFs would meet with future consumers' demands could not be made for lack of technological know-how on the side of the participants. An important and generally endorsed conclusion of the first meeting was that NPFs should not be put on the market as 'meat substitute' but should be promoted on their own merits.

In order to provide the participants with more information on NPFs, the second session began with plenary presentations, concerning technical and consumer aspects of NPFs. Thereafter, the participants discussed the consumers' aspects they considered relevant for the various meals (breakfast, lunch, dinner, snacks). Subsequently, they jointly designed an example of a non-animal protein food that fitted those criteria. Participants were given a number of product examples designed by the researchers. They, however, came up with entirely new product suggestions. Next, participants were asked to link these products with the technical information on semi-manufactured material for NPFs. These materials were given fantasy names by the technologists such as Fibrex and Protex. Thereupon an assessment was made by means of a +/– rating of the semi-manufactured NPFs vis-à-vis the consumers' aspects as formulated in the first TvC meeting.

The second meeting resulted in an estimation of relevant future trends in consumers' behaviour, and in an inventory of the uncertainties concerning NPF development resulting from these trends. Again, it appeared difficult for the participants to make a precise assessment of the products designed by the technologists, lacking information on the exact qualities of the semi-manufactured NPF materials (taste, texture, safety etc.). As a result, the meeting did not lead to a further selection of 'most suitable' NPFs on the basis of the assessment of consumers' aspects.

The third meeting took place in the final stage of the NPF project. The research on consumers' aspects at this stage was to provide information that could be used by the project team to draw up a path to NPF development. The project team needed information to answer the question 'which activities should be undertaken to induce consumers to behave in such a way that the meat substitution targets set for the year 2005 are met?'

The SWOKA researchers gathered information on demographic trends, developments in the work/leisure-time ratio, and the expected income per head in the future. The third meeting was to provide data on the market position of NPFs versus meat, consumers' acceptance of NPFs, and the percentage of meat substituted by NPFs in the future. The meeting began with presentations on the progress of the project at large and the environmental and technical analyses in particular. Further, the topic of meat consumption in the Netherlands was addressed. Thereupon, participants were split up into three groups in order to estimate the percentage of meat substitution for the years 2005 and 2035. To that end, they first discussed which people (age group, income group) would most likely buy NPFs, and on which meal-times they would eat NPFs. Thereafter, the participants discussed possible NPF products that would be most suitable for these target groups and meal combinations.

In a plenary session, the results of that exercise were elaborated upon, and a final statement was drawn up. The final statement was the end product of the TvC procedure. It presented the findings of the third meeting, together with an overview of the claims, concerns and issues on which consensus was (not) reached. It was concluded that NPFs would stand the best chance if they

were used as an ingredient. The chance that NPFs could replace a piece of meat such as a steak was considered very small. Further, it was found that sensory aspects such as taste and texture are important success factors. In addition, the participants reached the conclusion that the percentage of meat substitution of 40 per cent in 2035, as envisioned by the project team, was unrealistic, at least without clear governmental interference.

As was noted before, the TvC procedure formed an integral part of the NPF analysis process. The impact of the TvC on the development of NPFs can only be traced, therefore, via its effect on the NPF project as a whole.

The NPF project was never intended to directly address politics. However, the Ministry of Economic Affairs became gradually convinced of the potential contribution of NPF development for the Dutch economy. The project had less impact on other policy fields. For example, it did not lead the Ministry of Public Health to review the Meat decrees, which limit the amount of non-animal proteins allowed in meat products.

Among the actors that the project intended to affect there was, however, a clear impact. NPFs and NPF-related research topics were put high on the agenda of several national and European research programmes, and were discussed within a larger network of business firms and research institutes. Most importantly, the Netherlands Organisation for Scientific Research (NWO) has set up a research programme on 'Protein Foods, Environment, Technology and Society'. This so-called Profetas programme studies the environmental, technological and societal aspects of a large-scale introduction of non-meat, protein-rich products as a means to decrease the environmental impact of present food production systems.

With two of the companies that participated in the project, a clear effect can be seen. One of the larger firms seriously considers NPF development as new business. A small meat processing company has intensified its activities with respect to meat replacements and embarked on a close co-operation with others in this field. The impact of the TvC procedure is felt in the focus on sensory aspects of NPFs (taste, texture, 'bite') in the research agendas of, among others, the Profetas programme. Also the notion that consumers prefer meat substitutes as an ingredient (rather than as 'fake steak') is reflected in the research activities (Loeber, 1997).

Conclusions

This chapter described four early examples of pTA in the Netherlands, illuminating the wide variety of methods that are being employed. Within these, two broad strands can be distinguished: public participation and expert and stakeholder interaction. The Public Debate on genetic modification of animals was the first TA project that involved public participation. While the effort has been repeated a couple of times since, the consensus conference format has not really become a familiar phenomenon within the Dutch political system. Yet, the last five years have shown a strong revival of political interest

in public participation, particularly in the field of biotechnology. In resemblance to the Broad Societal Debate around Energy Policy (BMD), the Dutch Parliament has asked the Government to organise 'broad societal debates' on cloning (1998–9), xeno-transplantation (2000–1), and biotechnology and food (2001–2). These debates are all characterised by a broad variety of activities, ranging from local debates and science theatre to public panels and focus groups. With respect to public participation, the Netherlands seems to think big. The recent experience with broad public debates, however, has not yet led to a shared vision within Dutch society on how to organise public involvement on a regular basis.

The second type of participation in TA – the expert and stakeholder interaction as illustrated in the Gideon project and the NPF case – presents a widely accepted phenomenon in Dutch society. Both projects can be considered as pioneering projects. At the moment, these examples are copied in various places in the Netherlands, in particular by organisations involved in analysing system transitions, e.g. sustainable development, and in discovering impulses for new development paths and 'new' knowledge. We may conclude that while the attitude towards public participation in TA is still somewhat ambiguous, 'interactive' and 'constructive' forms of TA – entailing a 'multilogue' between experts and stakeholders on an equal footing – are increasingly being appreciated and stimulated.

Chapter 9

Switzerland: New Paths for Public Participation in a Direct Democracy

Case studies
- *PubliForum on Electricity and Society 1998 (Electricity CH)*
- *Dialogue on Genetic Testing 1998 (Gene Dialogue CH)*

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Introduction

Switzerland has a long tradition of involving citizens directly in decision-making processes, and public participation is an integral part of the political system. Several times a year, citizens are called to vote on various issues such as immigration policy, new taxes or European integration. Scientific and technological issues are also subject to the meddling of Swiss citizens. In the 1970s and 1980s, for example, several popular initiatives on nuclear energy were put to a vote and, in the 1990s, genetic technology appeared twice on the ballot box.

For many foreign observers, the Swiss direct democracy appears as an ideal of citizen participation. But the reality lies far from this ideal. Political campaigns preceding a vote can be very polarised and each party tries to convince the largest audience with often over-simplified arguments. Very complex issues are discussed in a Manichaean way, as the ultimate result of citizen participation is a 'yes' or a 'no'. And yet, direct democracy remains a valuable instrument of the Swiss political system and is deeply anchored in the Swiss collective identity. However, referenda and initiatives arguably represent a kind of democratic participation, which do not exhaust all forms of citizen participation.

This latter view has been taken by several institutions that have developed various forms of stakeholders or citizens involvement, especially in the area of land planning and environmental conflicts (see Knoepfel, 1995). In the domain of waste disposal, for example, several procedures aimed at finding a site for toxic or nuclear waste. Participatory procedures were also set up in

the energy policy in the 1990s, so as to unfreeze some long-lasting blockades. Conflict-solving groups including stakeholders have been called in by the Energy Ministry to discuss the controversial themes of radioactive waste, hydropower development and the construction of high voltage transmission lines. Other examples of participatory procedures can be found in the domain of urban development, as some cities, such as Zürich and Basel, set up participatory projects to reflect on their future. And at the time of wrting, more than 60 local Agenda 21 projects were running in Switzerland, at Cantonal or local levels. All these procedures, as well as others not mentioned here, aim at involving stakeholders or citizens in the policy-making process, so that their role can move from 'arbitrator', approving or rejecting a proposal, to a 'player' able to influence choices.

Nevertheless, if the inclusion of citizens was a reality at the local level, participatory projects dealing with national issues (such as energy policy) only included stakeholders. In this respect, the two case studies presented in this chapter are the first examples of procedures including ordinary citizens in the discussion of national relevant issues in Switzerland.

The first national participatory experiment including laypeople was carried out in June 1998 by the Centre for Technology Assessment. Following the Danish model of consensus conferences, this official institution, attached to the Swiss Science and Technology Council and dedicated to advise Parliament on new technology-related issues, organised a so-called 'PubliForum' addressing the question of electricity production and consumption. A few months later, a second participatory arrangement involving citizens was held by an *ad hoc* group consisting of public institutions, private enterprises and interest organisations under the name of 'Dialogue on Genetic Testing: Lay People and Experts in Discussion'.

These two participatory arrangements, which will be described in more detail in the following sections, opened the way for participatory technology assessment (pTA) in Switzerland. Their initiators succeeded in showing that citizen involvement in highly complex and controversial issues is feasible. Contrary to other public consultation instruments, such as polls and surveys, such dialogue platforms give qualitative insights into the way the public considers technology-related problems. Since then, the Swiss Centre for Technology Assessment has organised two further PubliFora and managed to introduce the method to interested circles like the media, politicians and scientists. Other institutions, such as the Foundation '*Science et Cité*', also experimented with participatory projects on science-related issues.

The PubliForum on Electricity and Society (Electricity CH)

The first PubliForum organised by the Swiss Centre for Technology Assessment (TA Centre) covered the discussion about electricity production technologies and energy-saving technologies, as well as more political questions such as energy taxes and market liberalisation. The TA Centre

launched this PubliForum with two parallel goals. First, it wanted to contribute to the political debate on electricity production and consumption at a time when several laws on the issue were in preparation (energy law, electricity market liberalisation and civil nuclear energy law). In this respect, the organisers aimed to allow citizens to discuss and evaluate the existing scenarios, the necessary measures and personal behaviour adaptations and to offer the politicians a basis for discussion and decision. Moreover, they wanted to promote a wide public discussion on electrical energy, as, at this time at least, it was mostly debated by experts and stakeholders. Second, with the launching of the PubliForum, the TA Centre took the opportunity to experiment with participatory arrangements at national level.

Energy: a Long History of Political Controversy

Energy – and more specifically nuclear energy – has raised important political disputes in Switzerland since the 1970s. The first nuclear power plant was built in 1969, and since then, this technology has met with a growing resistance. Nevertheless, in 1998, Switzerland had five nuclear power plants and nuclear energy accounted for 43 per cent of energy supply.

The first significant public action against nuclear power took place in 1975, with the occupation of a site for a new nuclear plant in Kaiseraugst (Canton of Aargau) by activists. Following this occupation, two anti-nuclear popular initiatives were launched in 1979 and 1984, both being rejected by the Swiss people. However, opposition to nuclear power among the Swiss public never faded, and was even reinforced after the Chernobyl accident in 1986. Citizens of the Canton of Aargau thus definitively rejected the project for a new nuclear plant in Kaiseraugst in 1989. And in 1990, a moratorium of 10 years on any new nuclear installation was established. Swiss citizens have preferred this temporary solution to a permanent stop, which was simultaneously proposed in a parallel initiative.

This 10-year moratorium pause was positively used to unfreeze some blockades, as three conflict-solving groups were called in to discuss the most controversial issues of the Swiss energy policy (see above). But some eight years later, at the time of the PubliForum, the nuclear future of Switzerland remained hotly disputed. The conflict-solving group on nuclear waste could not reach a consensus and the question of life expectancy of existing nuclear power plants was hotly disputed. The issue of energy and electricity was also gaining momentum on the eve of the new millennium, as the government was working on the electricity market liberalisation and as Parliament was preparing a new energy law, the main aim of which was to secure on economically and environmentally sustainable energy supply.

It is in this context of intense political debates that the TA Centre organised its PubliForum on 'Electricity and Society ' with the aim of bringing the views of ordinary citizens within a relatively closed debate. Moreover, at that time, no initiative or referendum had been called, so that the dialogue the TA Centre strove for could occur on a relatively constructive ground, where the issue would be at the core and not a voting campaign.

PubliForum: the Swiss Art of Consensus Conferences

The PubliForum 'Electricity and Society' was the first participatory project ever organised by the Swiss Centre for Technology Assessment. This Centre was set up by Parliament in 1992 as a four-year pilot experiment and has been attached to the Swiss Science and Technology Council, a consultative organ of the Federal Council (executive) on matters related to science and technology policy. In its first years of existence, the Centre for TA (then called TA Programme) had to evaluate scientific and technological developments funded by specific programmes of the Swiss National Science Foundation (the national Research Council). This situation limited the manoeuvring margin of the Centre. This restriction was dropped in 1996, when the pilot phase was extended for a second four-year period. From that time, the TA Centre was able to define freely its projects and relevant methods and was then in a position to launch the PubliForum on 'Electricity and Society'. After this second pilot period, the TA Centre was finally institutionalised and belongs now to the official landscape.

The launching of new projects is first discussed within the steering committee of the TA Centre, which is responsible for the strategic management and consists of people drawn from science, industry, politics, administration, trade unions and selected interest groups. Accordingly, the TA staff formulates a project proposal, which is then approved by the Steering Committee. In the case of the PubliForum on electricity, the Director of the TA Centre took the initiative to launch such a participatory process and presented a first proposal to the steering committee in 1996. After some corrections to the project, the majority of the steering committee were persuaded to organise a PubliForum on electricity, and a project manager was appointed at the beginning of 1997.

The design of the PubliForum on electricity followed the Danish consensus conference model: a citizen panel put questions to an expert panel about a technological issue, and then wrote down its opinions and recommendations in a report (PubliForum, 1998). The TA Centre and its accompanying group, however, preferred to name this conference 'PubliForum' as it considered the public interaction with experts to be more important in the search for consensus. Moreover, the word 'consensus' is rather negatively connoted in Switzerland, mainly because of the specificity of the Swiss political system based on consensual decisions[1].

The preparation and realisation of the PubliForum lasted, in all, 15 months. This fairly long preparation time is due to the experimental character

1 In the Swiss political system, all relevant forces of the country are integrated within the decision-making process. The executive power, for example, is organised in the form of a government cabinet made up of seven Federal councillors representing the four major political parties and the various linguistic regions, all of them having equal rights. Another example of the search for consensus can be found in the consultation procedures that exist in the pre-parliamentary phase of a legislation: all major political actors can respond to a project bill, so that the final project integrates, as far as possible, their views (Linder, 1994).

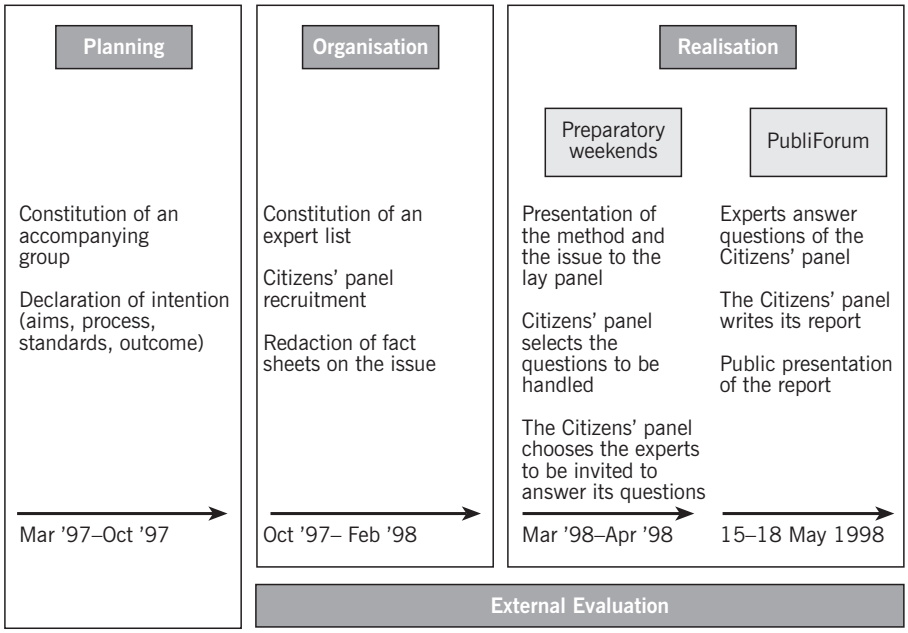

Figure 9.1 *Milestones in the PubliForum*

of the PubliForum[2]. Figure 9.1 gives an overview on the different events and phases that took place during the preparation and progress of the PubliForum.

The first step in the organisation of the PubliForum was to put together an accompanying group, which consisted of representatives of energy producing industry, of environmental organisations, of media and of specialists in the domain of energy and of participatory methods. No representative of the Ministry of Energy could be convinced to take part in this accompanying group[3]. A former deputy director of the Ministry of Energy sat in the accompanying group, but he was there for personal interest. Environmental organisations were also difficult to convince, as the PubliForum was not part of their priority actions. All major steps of the PubliForum were discussed within the accompanying group, from the date and place of the venue to the composition of the lay panel. This particularly important role of the accompanying group was due to the fact that the PubliForum was the first of its kind ever organised by the TA Centre.

The first and an important task of this accompanying group was to elaborate fact sheets on the main issues related to energy consumption and production, in order to inform and document the citizens' panel on the subject. They also had to help the organisers to compile a wide and diversified list of potential experts to be chosen by the citizens for the final expert

2 Further PubliFora have been organised over a period of 9 to 12 months.
3 The contacted persons considered that the energy issue should be addressed in dialogues with stakeholders.

hearing. Experts had been contacted throughout the whole country and in neighbouring countries, and many of them had been invited to a public presentation of the project so as to gain their interest. As a result of these efforts, the TA Centre could provide a list of 120 experts to the citizens' panel (with indications on their field of activity and their position on different issues of energy policy), from which 19 were finally chosen by the participants.

A total of 27 citizens had been invited to participate at the PubliForum. This is a relatively high number of participants, in comparison with other consensus conferences or similar pTA arrangements, in which the panel consists of generally about 15 citizens. This decision was motivated by the fact that the PubliForum was a national conference and, in this respect, should invite a significant number of citizens from every linguistic region of Switzerland, while proportionally respecting the size of each region. There were then 17 panellists from the German-speaking part of the country, seven from the French-speaking part and three from the Italian-speaking. Each panellist spoke his/her own language and an interpretation service was at the disposal of those who could not understand other languages besides their own.

The recruitment of the citizens' panel was not as easy as the organisers had expected. In a first attempt, candidates were recruited through a representative survey, so that everyone would have the same chance to take part in the arrangement. After completing a questionnaire, which contained many questions related to several issues, 1,000 persons were asked whether they wanted to participate at the PubliForum. However, only 15 of the respondents finally agreed to participate. The TA Centre complemented this first recruitment method with advertisements in major newspapers, as well as in newspapers for women and young people, as this category of persons appeared relatively uninterested in the PubliForum. In all, 60 citizens registered for the PubliForum and the organisers could then select an heterogenous group of 30 people[4].

The citizens' panel first met at preparatory weekends, in order to discuss the themes it wanted to handle, to formulate more specific questions and to choose the experts with whom to discuss these questions. On the main event, which lasted four days, the panellists first auditioned the invited experts and debated with them. On this basis, they wrote a report with their own analysis of the situation and recommendations. Finally, on the last day, they presented their conclusions to the media and interested persons. All the discussions within the citizens' panel and with the experts had been animated and supervised by a professional mediator.

As the PubliForum 'Electricity and Energy' was the first of its kind ever organised by the TA Centre and accordingly has an experimental character, it had been decided to charge an external and independent research team with the evaluation of the PubliForum. The team focused on the procedure of the participatory arrangement and analysed the process for transparency and fair

4 Based on this experience, the TA Centre adapted its recruitment method for further PubliFora: it sent an invitation to about 10,000 people, randomly selected, in order to receive about 100 registrations back.

organisation (Enderlin Cavigelli and Schild, 1998). Besides this evaluation, the Centre invited external experts to draw standards for fair and transparent procedures, inspired from the theory of procedural justice (Joss and Brownlea, 1998). These standards were used to develop rules of the game for all the involved actors (citizens, organisers, experts, members of the accompanying group) and have been published in a 'declaration of intention', distributed widely.

The PubliForum: a Small Voice in the Political Brouhaha

To achieve publicity for the PubliForum, the TA Centre set up a public relations strategy, for which different kinds of communication tools were used, such as press releases and press conferences, personal contacts with journalists, targeted contacts with local newspapers and diffusion of the lay panel report to Parliamentary members and to interested persons within the Swiss TA network. Members of the citizens' panel were also involved in distributing the results of the discussion to a broader public. Some of them contacted their local newspaper and radio, with some success. Other citizens sent the report with accompanying notes to politicians of their region and to their electricity company.

Media coverage on the PubliForum was fairly good, whether in the preparatory phase or after the PubliForum. About 35 articles were published in most major newspapers of the three linguistic regions. Most of them appeared in the daily press, but the PubliForum was also addressed in more specialised journals. Coverage of the PubliForum on the radio was also fairly good, especially in the Swiss German and Italian parts of the country, with a few broadcasts dedicated to the event. There was, however, little resonance of the PubliForum on television. Interestingly, most of the press articles and radio reports addressed the methodology of the PubliForum. The issue of electricity and the results of the PubliForum were only marginally considered. This can be explained by the fact that the PubliForum was the first experiment of this kind and it raised a lot of interest as such. In fact, the PubliForum took place during the political campaign preceding the vote on the 'gene protection' initiative (this initiative proposed drastic restrictions to the gene technology research in Switzerland), where over-simplified and sometimes exaggerated arguments were used by the different protagonists. Many observers thought that participatory arrangements such as the PubliForum would be far better used to discuss scientific developments than political campaigns, and journalists reported on the PubliForum as a new way to build bridges between science and society.

Many efforts were also undertaken to involve decision-makers personally into the PubliForum. One member of Parliament had a seat in the TA steering committee and in the accompanying group of the PubliForum. Numerous politicians also registered as experts to take part in the PubliForum (two of them were finally chosen by the lay panel to answer their questions). The first day of the expert hearings took place in the House of Parliament, and the

President of the Parliament as well as the President of the Commission in charge of energy agreed to open the PubliForum. Additionally on the second day, the minister in charge of energy for the Canton of Berne gave a speech.

After the PubliForum, the TA Centre remained in touch with politicians, so as to present them with the results of the lay panel and, eventually, to raise their interest for its conclusions. Members of Parliament sitting in a commission interested either by the issue or by the method received the lay panel report, and the TA Centre was given the opportunity to present it directly to the members of the parliamentary commission on energy. It also sent the report to the Ministry in charge of the elaboration of the law on the liberalisation of the electricity market, as this law was under consultation at the time of the PubliForum.

The way the PubliForum 'Electricity and Society' influenced political debate on electricity cannot be precisely stated; it can only be observed that some political decisions went in a similar direction as the conclusions of the lay panel, but no reference to it was made. However, one impact can be stated for sure: the new Federal Council's message on the promotion of scientific research for the period 2000–2003 mandates the TA Centre to carry on with PubliForas. The TA Centre was also contacted by other institutions to organise PubliFora dealing with genetic engineering and with transplantation medicine. As a result of these positive inputs, a second PubliForum on 'gene food' was held in the spring of 1999 and a third one on transplantation medecine was organised for autumn 2000, in collaboration with the Health Ministry and the Swiss National Science Foundation (PubliForum 1999; PubliForum 2000).

Discussion

The PubliForum on Electricity and Society, as the first participatory procedure ever organised by the Swiss TA Centre, had acted mainly as an icebreaker, both for the TA Centre, as the PubliForum's success proved the feasibility of participatory procedures in a multilingual context, and for subsequent PubliFora. Citizens experienced the discussions within the panel as stimulating and constructive, and nobody complained about the multilingual character of the procedure. Citizens also succeeded in writing a comprehensive and differentiated 'citizen report' on a highly complex issue.

The PubliForum was also an icebreaker for the idea of participation in TA: politicians, scientists and other stakeholders recognised the possibilities and advantages of dialogue for scientific and technological issues. Even though some remained sceptical, a majority of politicians and experts interviewed by the evaluators considered such participatory procedures as a promising tool to integrate citizens in the societal discussion on new technologies. The further PubliFora organised by the TA Centre confirmed this interest for dialogue, as politicians or actor groups, formerly sceptical about the idea of letting lay people discuss highly complex policy issues, could be convinced to take part in the project.

This 'pioneer' role held by the Swiss TA Centre also contributed to its visibility and, more generally, to the visibility of TA; the press, of course, reported on this arrangement, but many experts and stakeholders knew about the TA Centre and its activities as they participated in the PubliForum, be it as an expert, a member of the accompanying group or, simply, as an interested member of the public.

Dialogue on Genetic Testing: Lay People and Experts in Discussion (1998) (Gene Dialogue CH)

At the centre of the dialogue on genetic testing was the issue of predictive medicine, which mainly involves genetic testing as a means of identifying (potentially) harmful conditions in humans prior to their actual physiological manifestations. Reflecting recent developments, the focus of this initiative was on the use of genetic testing techniques in various fields of application, such as health care, insurance and criminal investigations.

An Emerging Technology with Social Implications

At the time of the Dialogue initiative, genetic testing had moved from being a purely technical issue – how the technique of DNA analysis and gene mapping works – to one which focuses on the (potential) use of this technique in various fields of application. Moreover, new legislation on genetic testing in humans was in the process of being considered by the Swiss Ministry of Justice. This proposed new legislation was the result of a vote in 1992 when the Swiss populace approved a constitutional amendment regulating reproductive medicine and gene technology (in the human domain). Following the vote, instead of enacting new legislation regulating gene technology in its entirety, the Federal Council (the Government Cabinet) decided to amend existing legislation where necessary. As a result, some nine legislative projects have been considered since, one of which is the aforementioned legislation on genetic testing.

The proposed law was intended to provide a binding framework for the regulation of genetic testing and fill existing gaps in policy practice. In autumn 1998, when the Dialogue arrangement took place, the formal consultation process – whereby the Ministry of Justice invited interested social actor groups, the Cantons and the wider public to comment in writing on the proposed law – had started. It was to last until the end of March 1999, after which the Federal Council was planning to introduce the proposed law in Parliament. In this respect, the aim of the Dialogue was to feed into this process of public consultation and give advice for the drafting of the law.

This legislative process ran relatively autonomously and did not raise much discussion. In fact, at the time of the Dialogue on Genetic Testing, there

was very little public debate on genetic testing. The discussion of the implications of gene testing for the various areas of social policy was more or less confined to those social actor groups with a direct stake – that is, the scientific community, industry, patients' organisations and policy-makers. This is not to say, however, that there had not been any public awareness of gene testing. On the contrary, the Dialogue arrangement followed a broad, and at times heated public debate about gene technology, which had evolved over a period of more than 10 years. This culminated in a popular initiative called the 'gene protection' initiative, which was launched in 1993. As a consequence of this, public debate intensified and became rather polarised. On the basis of various opinion polls carried out over a period of several years, public opinion appeared to be more critical than welcoming of gene technology, in particular in the Swiss–German speaking parts of Switzerland. Public debate was broad in the sense that it focused not only on the (perceived) risks associated with genetically modified organisms, but also on the ethics of animal research, the significance of gene technology for Switzerland's economic competitiveness, and so on. Gene technology in humans was discussed to a limited degree. The initiative was rejected in June 1998 by a surprisingly decisive majority of just over 66 per cent. Neither the Federal Council, nor Parliament, had offered a counter-proposal, as the Swiss political system allows for.

The Dialogue on Genetic Testing: a Genuine Procedure

The Dialogue on Genetic Testing was anchored in an *ad hoc* institutional setting, and not in an official institution, as was the case with the PubliForum. This *ad hoc* setting was made up of a support committee (or patronage committee), a stakeholder panel, and a secretariat. The support committee had the role of lending the initiative a high public profile; to guarantee the credibility and impartiality of the organisation; and to help in the dissemination of the results. The committee comprised prominent figures from both officialdom and the scientific community, including three Members of Parliament and the Secretary of State for Science and Research. The aim of the stakeholder panel was to allow all interest groups with a known public viewpoint relating to genetic testing access to, and participation in, the Dialogue on Genetic Testing. The panel played a key role, not only in that it funded a large part of the project, but also in that it was the main participant group alongside the citizens' panel in the assessment phase of the project. It was made up of 17 organisations altogether, including the Federal Ministry of Justice, the Swiss Academy of Medical Sciences, the Swiss Association of Insurers, the Swiss Bishops' Conference, the Consumer Forum KF, and the Swiss Huntington Association. A small number of known gene technology-critical NGOs (such as NOGERETE) were sceptical about the composition of the stakeholder panel, arguing that it was skewed in favour of biotechnology proponents. Other commentators thought the balance achieved was good.

The impetus for the Dialogue on Genetic Testing in the first instance came from Gian-Retto Plattner, a member of the Upper House of the Federal Parliament (Social Democrat), and physics professor at the University of Basel. The methodological conceptualisation and organisational implementation was carried out by Locher, Brauchbar & Partner, a small consultancy firm with previous experience of TA and public participation. The concept was partly inspired by the consensus conference and the citizens' jury model, but it also incorporated some new elements. As the first of its kind within the Swiss context, the initiative also had experimental character. Thus, it was intended that the initiative could also be used for the further development of such procedures.

At the centre of the Dialogue on Genetic Testing arrangement was an interactive assessment of the issue under consideration, involving three types of participants: lay people (in the form of the citizens' panel), experts (in the form of the expert panel) and interest group representatives (in the form of the stakeholder panel). The actual assessment proceedings were held in four distinct events over a period of three months, ending in November 1998. As the Dialogue on Genetic Testing was not directly linked to a specific, formal, decision-making process, there was no particular date when the initiative had to take place. However, since the idea of the initiative was to act as an input into the formal process of political consultation in connection with the proposed new legislation on genetic testing (which lasted from autumn 1998 to March 1999), the organisers wanted it to fall within this period of time – that is, sometime in autumn 1998. Figure 9.2 briefly outlines the milestones of the Dialogue on Genetic Testing.

The citizens' panel was made up of a mixed group of 24 men and women. Their task was to consider jointly the issue of genetic testing and identify topics for assessment in the Dialogue proceedings. They could select experts with whom to discuss their questions, in preparation for the debate with the stakeholder panel. They were supported in their task by a professional moderator whose brief was to facilitate the group dynamics – that is, to ensure that all panel members were given an equal opportunity to contribute to the discussion and that the communication was handled in a fair and impartial way. Similar to a consensus conference, the citizens' panel was chosen to reflect what 'ordinary' people – that is, people with no special expert knowledge, or vested interests – made of the issue under consideration, given the opportunity to deliberate among themselves and with experts and various interest representatives. The citizens' panel was recruited on the basis of two mailings, each comprising 3,000 randomly selected people across Switzerland. The addresses had been bought through a research company. Of the 6,000 addressees, 65 responded positively. From this, 30 names were chosen using a mixture of fixed criteria (gender, age, region) and flexible criteria (urban/rural area of residence, education, Church denomination, lifecycle, political orientation). Out of these, six persons finally dropped out for various reasons.

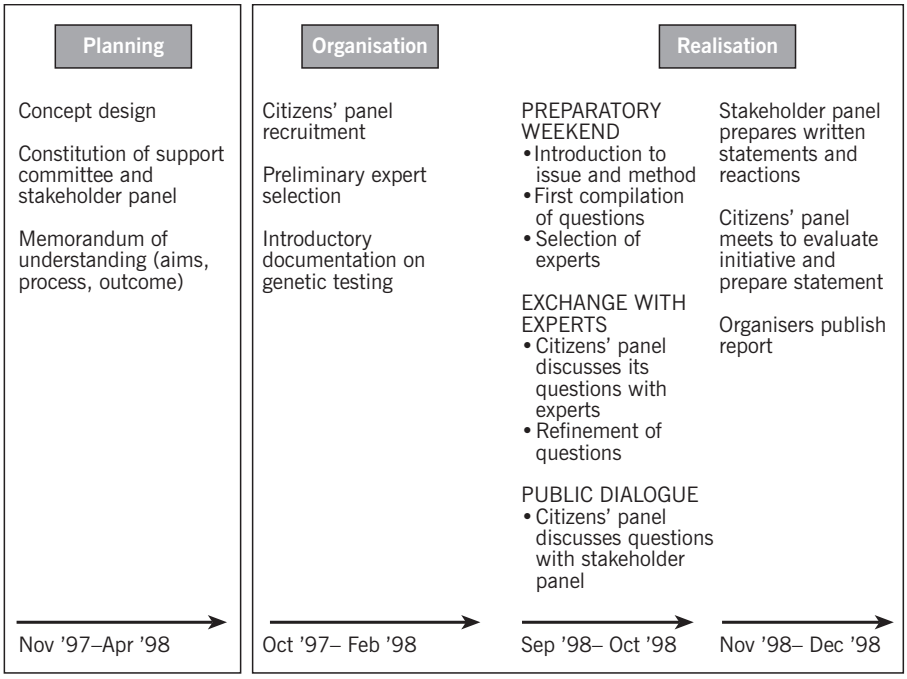

Figure 9.2 *Milestones of the Dialogue on Genetic Testing*

This citizens' panel had an important role, in that its members compiled, as in a consensus conference, the agenda (setting the questions and choosing the experts). But they also turned out to be interested in shaping the procedure. The organisers had planned that, following the exchange between the citizens' panel and the expert panel, the citizens' panel would pass their list of (revised) questions to the stakeholder panel members on the eve of the third event. The stakeholder panel members would subsequently have had to prepare written statements (on behalf of their institutions) in response to the questions. The statements would then have been announced at the beginning of the third event, after which the dialogue between the stakeholder panel and the citizens' panel would have taken place. As it turned out, the citizens' panel decided that this was too cumbersome and rather a dull procedure (hindering proper discussion), given the large number of stakeholder panel members expected to respond to all the questions. Hence, the panel decided instead to ask specific members of the stakeholder panel to address particular questions (rather than all members answering all questions), and to pose the questions 'on the spot' – that is, orally at the third event, rather than beforehand in writing. Similarly, the evaluation meeting of the citizens' panel had not been part of the original plans and, therefore, took place on a voluntary basis.

A Limited Echo

As with most pTA initiatives, it is difficult to gauge the impact of the Dialogue on Genetic Testing on the basis of direct evidence (on impacts, see Chapter 15). The nature of the initiative was such that the expected impacts were of a rather diffuse kind, in the sense that the initiative would contribute to wider public debate and the discussion surrounding the official consultation process relating to the proposed new federal law on genetic testing. As far as wider public debate is concerned, the initiative appears to have had only limited impact, judging by the number of media reports (39 newspaper articles, a majority of which was published prior to the participatory, and one radio broadcast on the day of the Public Dialogue). As far as the aforementioned consultation process is concerned, several stakeholder panel members stated that they were going to use the results of the initiative in the process of putting together a submission to the Ministry of Justice (see Locher, Brauchbar & Partner, 1999). The Ministry of Justice itself stated that it was going to use the results in its assessment of the official consultation process. Several stakeholder panel members also said that the Dialogue had a stimulating effect in relation to their internal working. As the parliamentary discussion of the proposed law on genetic testing was outstanding at the time of writing, the impact of the Dialogue on Genetic Testing on parliamentary debate cannot be commented on.

Discussion

With its *ad hoc* organisational set-up based on a broad spectrum of actively supporting institutions, the Dialogue on Genetic Testing initiative represents a methodologically innovative form of pTA. The fact that it was successfully concluded and that it produced tangible results (in the form of the citizens' panel statement and the written reactions by the stakeholder panel members) goes to show that participatory arrangements can be organised to good effect within different kinds of institutional and operative settings. At the same time, this case study also shows that an *ad hoc* setting makes the need for organisational impartiality and neutrality even more important than is already the case where a participatory arrangement is held by an established, recognised TA institution (such as the parliamentary/governmental organisations featuring in many of the case studies presented in this volume).

As to the issue of genetic testing, it is interesting to ask whether the Dialogue on Genetic Testing took place at the 'right' time. Would a similar initiative a couple of years earlier have elicited different kinds of reaction within the political, scientific and wider public sphere? Should the initiative have been carried out later, at the time when Parliament discussed the Government's law proposal on genetic testing? This, of course, is difficult to answer without evidence from comparable initiatives within the particular context of Switzerland. More generally, the issue of timing is one of considerable relevance to the discussion of pTA, as the analyses in Part IV of this

volume show. One of the recurring difficulties facing the organisers of pTA schemes is to decide when exactly to hold a technology assessment, given the relative lack of predictability of the timing of policy- and decision-making processes. At the time of planning of the Dialogue initiative, the parliamentary debate about the proposed new law on genetic testing was thought to follow shortly after the governmental consultation process. As it turned out, the parliamentary debate was still outstanding at the time of writing.

Conclusions

The two cases studies discussed in this chapter show that pTA initiatives can make a valuable contribution, even within a direct-democratic system. They provide an opportunity for an in-depth, differentiated discourse among various social actors on socially sensitive issues of science and technology policy. As such, they differ from the formal direct-democratic instruments, such as referenda and popular initiatives, which are mainly used at late stages of the political process. In this respect, pTA can bring a new dimension to public participation in that it allows interested citizens and organisations to contribute to the policy deliberation and policy-making process in a way that the formal tools of direct democracy do not.

Having said this, it is important to note that participatory arrangements, such as the ones discussed here, have not the same legitimating status as a referendum or a popular initiative. Whereas the outcomes of the latter – popular votes cast at the ballot box – are binding for government and Parliament, participatory arrangements have consultative status only. This lies in their very nature: they are single, limited processes, in which only a restricted number of citizens and other stakeholders can take part. They are not open to the citizenry at large. In this respect, participatory arrangements should be seen as complementary to, and not in competition with, the formal means of direct democracy.

Chapter 10

United Kingdom: From 'Public Understanding' to 'Public Involvement'

Case studies

- *Consensus Conference on Plant Biotechnology 1994 (Plant Biotech UK)*
- *Citizen Foresight on the Future of Food and Agriculture 1998 (Citizen GMO UK)*

Simon Joss

Public Participation in the UK Context

Until the mid-1990s, public participation was hardly an issue in technology assessment (TA) in the United Kingdom. Institutionalised TA within the political sphere was essentially limited to the provision of scientific-technical information and expert advice to policy- and decision-makers. For example, the Parliamentary Office of Science and Technology (POST) was set up in the late 1980s with the explicit remit of informing Members of Parliament of scientific and technological developments (Norton, 2000). Similar intra-institutional use of TA could be found in the executive branch of government, like the Office of Science and Technology (OST) (within the Cabinet Office, later the Department of Trade and Industry). Such TA did not aim to engage actively with the public, and thus there was no real demand for participatory methods.

Since the mid-1990s, however, there has been a growing interest in public participation and consultation in science and technology. Initially, this interest mainly came from individual academics, 'think tanks' and public-oriented organisations. Several experiments with participatory methods took place, as a result of which officialdom began to address the issue of public participation more actively, resulting in policy recommendations, such as the prominent House of Lords' *Science and Society* report (2000) and POST's *Open Channels: Public Dialogue in Science and Technology* (2001), as well

as practical initiatives, such as the OST's biosciences public consultation initiative (1999). An important step in this development was the first UK national consensus conference held in autumn 1994 (Science Museum, 1994). Whilst this conference had little impact on policy-making on plant biotechnology (the issue at stake), it substantially influenced subsequent discussions in the fields of the public understanding of science (PUS) and science and technology governance. Throughout the middle to late 1990s, several experiments in participatory TA took place, including various citizens' juries (for example, on information technology in the public service, in Norwich in 1996; and on genetic testing, in Wales in 1997), deliberative polls (for example, on genetics, in London in 1997, organised by the Wellcome Trust) and citizen foresight (see case study that follows).

The above development coincided with more general calls for a shift in public policy- and decision-making towards greater public engagement and consultation. Advocated mainly by left-of-centre politicians, some academics and social commentators, more direct public involvement in policy consultation and decision-making was seen as a way of countering the perceived voter apathy, 're-connecting' with the public, and rendering policy- and decision-making more effective and accountable (see, for example, Seargeant and Steele, 1998; Stewart *et al.*, 1994; DETR, 1998). These calls were given a boost by the 1997 general election, when Labour was voted into office following 18 years of Conservative government. Practical implementation of public participation has taken place at local government level, where methods such as citizens' juries have been frequently used; at regional level, such as in Scotland, where the Scottish Parliament has set up an electronic public involvement scheme (public petition initiative); and at central government level, where departments, such as the Department of Trade and Industry, have instigated various public consultation schemes.

In the early 2000s, the issue of participation, and particularly public involvement, is overall characterised by a certain amount of ambiguity: on the one hand, it has found a place on the political agenda (especially at local government level and departmental level within central government, where public consultation is increasingly sought proactively); on the other, it often remains rather ill-defined in terms of both its institutional anchoring and its functional role in the policy- and decision-making processes. The latter may be partly due to the still relative novelty of public participation in the policy-making processes, thus requiring further definition and experimentation. It may, however, also be partly due to the apparently increasing centralisation and use of experts (for example, through rising numbers of largely unaccountable 'quangos' – quasi non-governmental organisations) in government, which seems to go against public involvement.

This ambiguity can also be seen in the area of science and technology policy: whilst public participation has been considered in policy reviews (such as the House of Lords' *Science and Society* report) and has been part of a research programme by the national Economic and Social Research Council (ESRC), it has neither been institutionally nor procedurally embedded in a

way that happened in other European countries, such as Denmark, the Netherlands and Switzerland (see respective chapters, this volume). There is no designated official institution charged with carrying out participatory TA (such as the Rathenau Institute in the Netherlands, or the Danish Board of Technology). Notably, POST has no formal remit to pursue public-oriented participatory TA. Instead, participation has been discussed and implemented by a variety of public and private organisations usually in an *ad hoc*, experimental fashion.

Two such experimental participatory arrangements are discussed in this chapter: the aforementioned first UK national consensus conference on plant biotechnology of 1994, and the citizen foresight on the future of food and agriculture of 1998[1]. The former is of interest because it was an adaptation of the Danish model of consensus conference, and because it signalled a turning point in the conceptualisation of 'the public understanding of science' (of which, further below). The latter is of interest because it represents a further development of the citizens' jury method, which has been used mostly at local or regional level, and because of its particular *ad hoc* institutional setting.

The UK National Consensus Conference on Plant Biotechnology (Plant Biotech UK)

The UK National Consensus Conference on Plant Biotechnology was the first Danish-style consensus conference held in Britain. It was a joint initiative of the national Science Museum, London, and the Biotechnology and Biological Sciences Research Council (BBSRC). The BBSRC funded the consensus conference at a cost of approximately £86,000 (ca. Euro 135,000). The Science Museum was in charge of the organisation.

The Arrangement

The consensus conference, which was held in public, took place over a period of three weekdays in early November 1994 in London (for an overview, see Joss and Durant, 1995). At its centre was a panel of citizens made up of eight women and eight men from across the United Kingdom. The panel's task was to assess the issue of plant biotechnology, and particularly genetically modified (GM) plants, from their perspective as a group of 'lay people' – that is, non-experts, with no professional or particular (vested) interest in the issue. The overall objective was to encourage a broader public debate, and to contribute to relevant public policy-making, on plant biotechnology. Figure 10.1 gives an overview of the arrangement and its setting.

1 The case study on the 1994 consensus conference is based on the formal evaluation carried out by the author as part of his doctoral research (Joss, 1998a). The case study on the citizen foresight is based partly on interviews with Dr Tom Wakeford, whose assistance is gratefully acknowledged. The case study also draws on the separate evaluation carried out by Weldon and Simmons (2001).

Setting

Hosted by Science Museum; funded by Biotechnology and Biological Sciences Research Council; steering committee oversees implementation; full-time project manager in charge of organisation

Arrangement

Preparation	1st and 2nd weekend	Public conference	Follow-up activities
Appointment of citizens' panel	Information pack on plant biotechnology	Experts discuss questions of citizens' panel	Citizens report sent to various stakeholders
Selection of date and venue	Discussion of role of citizens' panel	Deliberation amongst citizens' panel	Briefing sent to MPs by POST
Pre-selection of experts	Citizens' panel defines agenda and questions	Citizens' panel presents its report to the audience	
Media event	Citizens' panel selects experts	Concluding discussion amongst participants	

Evaluation

Formal evaluation as part of a PhD research project; funding from external research councils

Notes: MPs = Members of Parliament; POST = Parliamentary Office of Science and Technology

Figure 10.1 *The UK National Consensus Conference on Plant Biotechnology*

The citizens' panel was put together as a result of a call for lay volunteers to participate in the consensus conference. This took the form of advertisements in regional newspapers across the United Kingdom, radio broadcasts, as well as a national press conference. The application procedure – which served to obtain information about the applicants' interest in getting involved in the consensus conference, and to ensure that the conditions of participation were properly understood – resulted in 341 written applications, which formed the sample for the selection. The main selection criteria were gender (equal numbers of women and men) and age (three age groups). Furthermore, a good mixture was sought in terms of residential area (urban, rural), education (basic, higher) and life cycle (children, no children, living at home). Overall, the aim was to achieve a good cross-section of the public on the citizens' panel. It was made clear that the panel was neither statistically representative of the British population, nor politically representative (to decide on behalf of the public). Instead, the aim was to see how a mixed group of interested lay people would assess the issue of plant biotechnology, what conclusions they would draw and what recommendations they would make as a result of an interactive process of considering the issue amongst themselves and with various experts.

In order to be able to prepare themselves for the public conference, the members of the citizens' panel met at two weekends in September and October 1994. They were given reading materials, as well as oral presentations by teachers and experts, on various issues relating to plant biotechnology. A professional facilitator supported the group's process of considering the issue and planning their work. By the end of the two weekends, the citizens' panel had to have its questions ready for discussion at the conference, and it had to have selected a panel of experts, who would answer and discuss the panel's questions at the conference. The Science Museum provided logistical support for the two weekends and was responsible for the smooth running of the public event.

The conference itself was attended by 200–300 people on each of the three days, including representatives of the media. It was opened by the Parliamentary Secretary of the Ministry of Agriculture, Fisheries and Food. The citizens' panel debated its seven questions (on risks/benefits, impact on consumers, impact on the environment, moral/ethical issues, patenting, international development, and regulation) with a 22-strong expert panel. The experts were given a short amount of time to give prepared answers to the questions put to them, followed by a discussion between the citizens' panel and the experts. In the afternoon of the second day, the panel withdrew behind closed doors to carry out an assessment of the information received and the views held within the panel. Through an iterative process – which lasted well into the early hours of the third day – including small-group and plenary sessions, the panel put together a 14-page assessment document (the 'lay panel report'). The panel made its report public on the third day of the conference, which was then discussed amongst the conference participants. There were formal responses by two Members of Parliament (from opposite parties) and a representative of the United Nations Environment Programme, amongst others.

Outcomes and Impacts

Following the conference, the Science Museum printed and disseminated several thousand copies of the report, which was also made available on a government website. The Parliamentary Office of Science and Technology (POST) sent a briefing paper on the conference to Members of Parliament. There were 128 articles (24 in national newspapers; 35 in regional and local newspapers; 67 in specialist magazines; 2 in foreign newspapers), 25 radio (17 national, 8 regional) and three television broadcasts. This level of media coverage is comparable to coverage of consensus conferences elsewhere, including Denmark. Interestingly, reporting peaked prior to the actual conference, around the press conference announcing the call for volunteers and the conference itself, with many articles focusing on the special nature of this novel initiative.

The conference had no visible, direct impact on public policy- and decision-making on plant biotechnology, although it attracted wide interest amongst those involved in relevant policy-making, including politicians, civil

servants and experts. It also appeared to have little impact on related public debate, which was not particularly pronounced at the time (compared with the intensive public controversy on GM food that was to follow in the late 1990s). Instead, the conference's impact was more indirect, on the conceptual-methodological level, in that it contributed to a wider debate within the scientific community, academia, amongst policy- and decision-makers and social commentators. Broadly, this debate has been concerned with the (troubled) relationship between science, technology and the public, and related to this, the perceived need for more transparent and open governance of socially sensitive scientific-technical issues. The method of consensus conference has been discussed alongside other tools of public involvement, such as citizens' juries and focus groups, as possible practical responses to this debate. At policy-making level, the experience of the consensus conference was discussed, amongst others, in three influential reports – namely, the Royal Commission on Environmental Pollution's Review of the *Framework for Overseeing Developments in Biotechnology* (1999); the House of Lords' *Science and Society* report (2000: 39–49); and the House of Commons Public Administration Select Committee report on *Public Participation: Issues and Innovations* (2001: xxi). A second national consensus conference was held in 1999 on the issue of radioactive waste management (UKCEED, 1999). It was mainly funded through public grants from OST and the Natural Environment Research Council (NERC). It was organised by the UK Centre for Economic and Environmental Development (UKCEED), an independent research and policy foundation.

The 'Public Understanding of Science' Context

In trying to assess this first consensus conference, one has to consider it in the wider context of the UK-specific 'public understanding of science' movement. The 'public understanding of science ' which is distinct from institutionalised TA reported elsewhere in this volume, was given programmatic status in the late 1980s following an influential report in 1985 by the Royal Society (the British academy of science). In *The Public Understanding of Science* (1985), the Royal Society called for the improvement of the public's knowledge and appreciation of science and technology, mainly through educative measures. The background of the report was an increasing concern amongst the scientific and engineering communities that a lack of public understanding would hamper the UK's science and technology base. The report met with a good response from the scientific community and policy-makers, resulting in various new initiatives, including grant schemes to give financial support to scientists wishing to communicate their work to pupils and the general public, a research programme by the Economic and Social Research Council (ESRC), and the annual 'science week' hosted by the British Association for the Advancement of Science.

In 1993, the government made the public understanding of science official policy when it published *Realising Our Potential*, a White Paper on science

and technology (HMSO, 1993). Education as a means of improving public knowledge of science figured centrally in the White Paper's section on the public understanding of science. Achieving more positive public attitudes towards science and technology was seen as crucial for the commercial exploitation of UK science and technology (Waldegrave, 1993; DTI, 1996). As a result of the White Paper, the six national research councils were expected to launch activities promoting the public understanding of science. The consensus conference was the first such activity for the BBSRC. Similarly, it represented a bold initiative for the Science Museum, which in the late 1980s had become active in the conceptual and practical development of the public understanding of science agenda through, for example, the academic journal *Public Understanding of Science* and various museum-based events.

However, whilst the public understanding of science initiative was crucial for making the consensus conference possible – POST did not have the means or mandate to initiate the consensus conference itself – at the same time it lent the consensus conference certain disadvantages. One such disadvantage was that the consensus conference was normatively and conceptually associated with the so-called 'deficit model' prevalent at the time within the public understanding of science movement. According to this model, the apparent deficit of (scientific) knowledge is the cause of a lack of public appreciation of science and technology, which, however, can be remedied with appropriate educative measures (teaching of scientific methods etc.). Another disadvantage was that the consensus conference was placed outside the (formal) policy-making process, as the public understanding of science initiative was largely understood to concern the science–public relationship and less so the science–politics relationship.

The organisers were, to an extent, aware of these disadvantages. The Science Museum argued at the time that the consensus conference should be seen as an innovative means of trying to overcome the deficit model (Durant, 1995). And repeated attempts were made to link the conference to the ongoing policy-making process on plant biotechnology. Nevertheless, these disadvantages manifested themselves at several stages in the implementation of the conference.

Several observers criticised the consensus conference for its alleged pro-biotechnology stance and for serving to seek public acceptance of, rather than a genuine open-ended debate about, genetically modified plants. They pointed to the allegedly one-sided composition of the steering committee overseeing the organisation. The conference evaluation subsequently showed that two committee members had tried to exclude 'extreme' anti-biotechnology voices – such as Greenpeace – as experts from the preparatory weekends and even the conference itself, although this was rejected by the other members (Joss, 1998a). Another indication of a relative pro-biotechnology stance came in an article jointly authored by those responsible for the consensus conference at the BBSRC and the Science Museum, and published (prior to the conference) in *Science in Parliament* (Miles *et al.*, 1994). The article refers to the 'fruits of the new biology' to be 'enjoyed', and predicts 'quality of life' improvement

and 'wealth generation' to result from this new technology. The citizens' panel became aware of this apparent pro-biotechnology stance of the organisers and, therefore, decided to suspend temporarily its collaboration with the facilitator and the organisers. By distancing itself from the organisers, the panel sought to refute the allegation that it was pro-biotechnology and to demonstrate its independence. It explicitly asserted its independence in the opening statement of its report (Science Museum, 1994).

Another criticism, made by a couple of civil servants in the evaluation (Joss, 1998a), was that whilst the conference *per se* was interesting, the subject of plant biotechnology was something of a non-issue, as it was not being considered in the policy-making process at the time. It was argued that a more topical issue could have had more of an impact on policy-making. However, in deciding to fund the consensus conference, the BBSRC had insisted on plant biotechnology – as opposed, for example, to transgenic animals – on the grounds that it had come to view this as the 'least contentious' area of biotechnology. This decision was probably influenced by the fact that within the BBSRC the idea of funding a consensus conference was itself rather controversial. The council would probably not have funded the initiative, had it not been for the unequivocal support for it by its then chief executive, Professor Tom Blundell. Therefore, the chosen issue had to be one that was acceptable to the council. (Interestingly, after the departure of Professor Blundell from the BBSRC, the council returned to more traditional public understanding of science activities.)

Apart from the choice of issue, another reason why the consensus conference was not particularly well connected to the policy-making process may have been a lack of interest on the part of decision-makers. A couple of parliamentarians indicated privately that whilst the consensus conference was to be welcomed as a public understanding of science initiative (targeted at the public), it did not have much of a place in the well-established political structures and procedures. Whilst POST's director could sit on the steering committee in his personal capacity, his office could not host the conference itself. Having said this, however, there was a small number of politicians, mainly from the Labour party (such as Anne Campbell MP and Dr Tony Wright MP), who took an interest in the conference as an innovative, novel form of public consultation.

In summary, the first national consensus conference arguably represented a bold innovation by two organisations with no prior experience of participatory TA. Inspired by its European predecessors, it was the first initiative of this kind and on this scale to take place in the UK. In terms of its actual organisation and the involvement offered, it was judged by the majority of participants to have been successful, though a number of specific criticisms were made (see above). The conference's impact was low on policy-making and public debate concerning plant biotechnology, but relatively high on the conceptual-methodological level, where it has since been discussed as part of a wider, ongoing debate in the United Kingdom about the role of public participation in public policy- and decision-making.

The Citizen Foresight on the Future of Food and Agriculture (Citizen GMO UK)

The Citizen Foresight on the Future of Food and Agriculture was an adaptation of the citizens' jury model, which is one of the most widely used local public involvement methods in Britain (Stewart *et al.*, 1994; Romslo, 1997; Seargeant and Steele, 1998). The citizen foresight was held in spring 1998, at a time when GMOs and GM food were debated increasingly controversially in the public. The citizen foresight was a one-off, experimental initiative, commissioned by the Genetics Forum, a gene technology-critical campaigning organisation, and run by the University of East London's Centre for Governance, Innovation and Science (see overview in Figure 10.2).

Setting

Initiated and commissioned by the Genetics Forum; hosted by the University of East London; seven-strong stakeholder panel to oversee implementation and give responses to citizens' panel report; project manager in charge of methodological design, organisation, and process facilitation

Arrangement

Preparation	Citizen foresight: sessions 1–10	Media event and follow-up activities
Recruitment of citizens' panel	Session 1: presentation of objectives/ method; citizens' panel defines options and assessment criteria re: issue	Summer 1998: Genetics Forum hosts media event: presentation of report; stakeholder panel gives responses to citizens' panel report
Selection of four expert witnesses	expert panel analyses citizens' panel's options and criteria	Winter 1999: report presented to parliamentary committee
Appointment of expert panel	Sessions 2–8: expert witnesses give evidence; question-and-answer sessions; citizens' panel requests three further expert witnesses	Spring 1999: citizen foresight report published
	Sessions 9–10: citizens' panel evaluates information and writes report	

Figure 10.2 *The Citizen Foresight on the Future of Food and Agriculture*

The Arrangement

The citizen foresight involved four types of participants:

1 a local citizens' panel, consisting of 12 men and women;
2 a stakeholder panel, made up of seven different stakeholder representatives;

3 an 11-strong expert panel;
4 seven expert 'witnesses'.

The citizens' panel was at the heart of the citizen foresight initiative. Its task was to consider the future of agriculture and food production from their viewpoint as citizens, and make recommendations in the form of a written report. The panel was put together using random selection and quota sampling methods: from the electoral register of Brighton, the city in south-east England where the citizen foresight was held, 2,000 names were selected at random. These were sent a letter of invitation, detailing the aims and structure of the citizen foresight. No information was given as to the issue to be considered, except that it was 'a matter of great concern to the government'. Participants were offered £150 (approx. euro 240) for their efforts. Respondents were asked to complete a short questionnaire, including questions about daily newspapers read, level of education and most recent employment. Around 200 people responded positively. There was an under-representation of men and young people (the latter due, at least partly, to the fact that the sample was drawn from the electoral register). The selection of 12 panellists from the 200 volunteers proved difficult according to the project manager, as some of the quotas (such as 'retired male') could not be achieved because of insufficient numbers of candidates in certain categories. In the end, the selection of panellists was done partly randomly, and partly based on the educational criterion.

The stakeholder panel's task was twofold: first, to give advice and organisational support to the project manager (who stated in an interview with the author that he would not on his own have been sufficiently competent to represent all interests in relation to the issue considered); and secondly, to involve the relevant stakeholders actively in the implementation of the initiative so that they would have confidence in the process and, thus, take the result seriously. The stakeholder panel consisted of representatives from seven organisations that are engaged, in one way or another, in the debate about gene technology and food policy: the Consumers' Association, the largest independent consumer organisation in Britain; the John Innes Centre, a governmental biotechnology research institute; the National Farmers' Union; Sainsbury's, the large, nationwide retailer; the Soil Association, the organic farmers' national association; the Transport & General Workers' Union; and Whole Earth Foods, a food processing company.

An expert panel met separately early on in the process to consider the citizens' panel's initial deliberations and give feedback to the citizens' panel. The 11 experts, who represented different kinds of expertise – including biotechnology research, farming, regulation and social sciences – were selected by the stakeholder panel.

The task of the expert witnesses was to give presentations at several meetings of the citizens' panel and to answer the panel's questions. The witnesses were selected by the stakeholder panel and included the director of a public research institute, two academics in the fields of food policy and

environmental science, and a scientist and member of the governmental Advisory Committee on Novel Foods and Processes. The citizens' panel requested two additional witnesses, to give evidence on pesticide residues in food stuffs.

The proceedings were held over a period of 15 weeks in spring 1998. The citizens' panel gathered at ten weekly meetings, each meeting lasting around three hours (rather than the usual four day-long meetings in citizens' juries). The meetings were held in the evenings in a local pub in Brighton, thus allowing the panellists to fit in their participation with their everyday life/work.

At the first meeting, the citizens' panel was told the issue to be considered. The project manager, who also acted as group facilitator, explained the objectives and the structure of the citizen foresight. There was reportedly some concern amongst the panellist about the 'real' aim of the organisers and whether there might be a hidden agenda. The panellists were wary of the possibility of a (political) instrumentalisation of their participation. However, following a discussion with the project manager, they endorsed the proposed procedures. Following this introduction, the citizens' panel split up into four groups, which were asked to brainstorm on options regarding the future of agriculture. No lead was given. The result of this brainstorming session was an extensive list, ranging from gene modification, chemical pesticides and organic farming, to local food processing, packaging use and the importing of food products.

In a second round of brainstorming, the panellists were asked to identify assessment criteria, against which they wished the various options to be evaluated. Again, the resulting list was extensive, ranging from taste, shelf-life and nutritional content of food, to effects on the natural and human environment, producer diversity and the ethics of working conditions. Following this, the panel was asked to carry out two rankings: the first to indicate how much information the panel needed regarding both the various options and assessment criteria; the second to indicate the relative importance of the assessment criteria. This enabled the project manager to draw up a table, listing options against the assessment criteria. This table was subsequently given to the expert panel for assessment (see below).

The above procedure was based on a multifactor analysis method designed by Dr Andrew Sterling (University of Sussex) advising the project manager on the methodological design of the citizen foresight (see, for example, Sterling, 2000). The project manager retrospectively thought the procedure, which had to be completed within less than three hours, might have been a little intimidating for the citizens' panel, but that it had worked all right.

In between the citizens' panel's first and second meeting, a meeting was held with the expert panel. The experts were asked to analyse the options and criteria that the citizens' panel had come up with. The experts were asked to state what the effect of the various options was on the criteria: for example, they were asked to state whether the option 'gene modification' would have a beneficial, detrimental or neutral effect on the 'taste ' or 'shelf-life' criteria etc.

The aim was to establish the extent to which there was common ground amongst experts. Where the experts disagreed, this was indicated in the table drawn up by the project manager. Following the meeting, the completed table was given to the citizens' panel at their second meeting. It served as background information for the remaining meetings. The table was also given to the witnesses that were invited to give evidence at the citizens' panel meetings.

Meetings 2–7 of the citizens' panel consisted of witnesses presenting information to the panel, followed by a question-and-answer session. There was one witness per meeting. After giving his/her presentation, a witness would leave the room briefly so that the panellists could discuss amongst themselves what questions to put to him/her. The stakeholder panel had agreed on four witnesses, but the citizens' panel wanted to hear from additional witnesses, particularly on the issue of pesticide residues in food, which appeared to concern the panel greatly.

Following the evidence given by the last witness at the eighth meeting, the panel began discussing what they wanted to state in their assessment report. This evaluation was continued in the ninth meeting, at the end of which the panel had drafted its report. At the tenth meeting, the typeset report was presented to the panel and the meeting was used to make revisions where necessary.

The final stage of the citizen foresight initiative was a media event in London, which was hosted (and funded) by the Genetics Forum. At the meeting, the citizens' panel and stakeholder panel met for the first time (although not all stakeholder panellists were in attendance). The citizens' panel's report was published and the stakeholder panel lists were invited to give their reactions.

The project manager retrospectively stated that the London Centre for Governance, Innovation and Science should ideally have organised the media event (as the organiser of the citizen foresight). However, there was no funding for this, and the centre had no previous experience of staging a media event and had hardly any public profile to attract sufficient media interest. The Genetics Forum, having funded the initiative, saw the citizens' panel report essentially as theirs. It had exclusive prior access to the report, allowing it to put together a press notice. The members of the stakeholder panel did not have prior access to the report, but were expected to react to the report at the event. At least one member was reported to have been concerned about this. The media event was the only time when the citizen foresight was opened to the media/the wider public. All other meetings took place behind closed doors.

Outcomes and Impacts

The citizens' panel's report and the stakeholder panel's responses were published in March 1999 in a final report that also contained a method description (Centre for Governance, Innovation and Science/The Genetics Forum, 1999). The report was aimed at those involved in food and agricultural policy and/or those interested in public involvement schemes. The report

was not sent to Members of Parliament, but was launched in January 1999 at an event of the Parliamentary Environment Group (House of Commons). Several government departments were sent the report (including the Ministry of Agriculture, Fisheries and Food, the Department of the Environment, the Department of Trade and Industry, the Department of Health, and the Policy Unit at 10 Downing Street). A meeting with the Minister of State for the Environment to discuss the findings with the citizens' panel was arranged by the Genetics Forum.

There was only limited media coverage. One brief article was published in the national broadsheet newspaper the *Guardian*. The initiative was mentioned in two national television news programmes (Channel Four's main news at 7 p.m., and the BBC lunchtime news) and on radio (BBC Radio 4 and 5). Several articles appeared in specialist magazines and periodicals. The local media in Brighton, where the initiative took place, were not informed of the initiative. The project manager regretted this lost opportunity retrospectively.

There was no formal, direct link between the initiative and the policy-making process. The OST, which at the time was involved in preparations for a public consultation process on biosciences (see introduction, above), declined to fund the initiative and to participate on the stakeholder panel.

Overall, there was no visible impact on policy-making. Of the various government departments, the Department of the Environment (whose minister met the citizens' panel) reacted the most positively, according to the project manager, saying that the panel's call for more transparent and open regulation was in line with the Department's position in favour of stakeholder involvement. The OST was apparently relieved that the panel had not rejected GM food research outright. The Ministry of Agriculture, Fisheries and Food was said to have shown no interest in the final report.

No formal evaluation to assess the citizen foresight initiative was undertaken. There were no plans to hold a second citizen foresight. However, the project manager subsequently became involved in a citizens' jury initiative in India (Action Aid, 2000).

Experiment in Opinion Gathering or Democratic Decision-Making?

The citizen foresight is to be understood against the background of two ongoing developments at the time: one, the emergence of an increasingly intensive public controversy on GMOs and GM food; the other, the evolving debate about the role of public participation within the context of 'the public understanding of science'.

The Genetics Forum was mainly interested in assessing public opinion on GM food. It was opposed to the import of GM soya into the UK, and criticised the industry's policy of not separating GM soya from non-GM soya. It, therefore, originally wanted to commission a public opinion survey – expecting public opinion to be negative – to use the results in its campaigning. Dr Tom Wakeford, who was on the management committee of the Genetics Forum, argued in favour of a more sophisticated and credible method than

an opinion survey for assessing public perceptions. Consequently, Dr Wakeford was commissioned to develop an alternative method, which resulted in the citizen foresight method. In an attempt to give the citizen foresight more organisational and institutional independence, Dr Wakeford, who acted as its project manager and process facilitator, resigned from the management committee of the Genetics Forum and hosted the citizen foresight at the University of East London. In designing the initiative, Wakeford's aim was to explore 'new democratic tools' for technological decisions that would 'allow the public to view themselves as citizens' (London Centre for Governance, Innovation and Science/ Genetics Forum, 1999: 'background'). The citizen foresight was to be an improvement over existing 'public understanding of science' engagement methods, especially the 1994 consensus conference. In particular, Wakeford wanted to define the issue more broadly in terms of the future of agriculture and food production, rather than just genetic modification.

However, despite this broader focus, for the Genetics Forum and some of the stakeholder panel members, this initiative was essentially about assessing public perceptions on GM food. One participating stakeholder explicitly complained about the broadening of the issue (Weldon and Simmons, 2001). Therefore, there seem to have been two different rationales at work, creating a certain conceptual tension within the arrangement.

One of the reasons why the citizen foresight did not widely register in the public sphere as a public engagement process and showed little effect on GM policy (which was increasingly discussed in the public debate) probably had to do with the fact that this was essentially an initiative of the Genetics Forum (especially given that the only public event was hosted by the Genetics Forum). As such, it may well have been perceived from the outside as part of the Genetics Forum's campaigning activities. Another, related reason may have been the fact that the citizen foresight was not linked to the relevant policy-making processes. Furthermore, apart from the media conference following the citizens' panel's deliberations, there was no public access to the proceedings.

However, the citizens' panel's report may well have had an impact on the members of the stakeholder panel and their organisations, as they committed themselves to providing written responses to the citizens' panel's report, although what effects on internal policy-making this may have had is not known. Most stakeholders seem to have viewed the initiative mainly as an interesting experiment in gathering public opinion (Weldon and Simmons, 2001).

Methodologically, the citizen foresight arguably represents an improvement of the citizens' jury method, on which it was based, in that the citizens' panel was given more opportunity to define the agenda, formulate questions and write the conclusions (in citizens' juries, the organisers typically set a specific agenda, formulate key questions for the citizens' panel to consider, and write the analysis). Also, by adapting the process (from four full days to ten evening sessions in a local venue), the initiative was made to fit in better with the participants' everyday life. However, by closing the process off to the

wider public and only allowing media access at its conclusion, a connection with wider public sphere discourses was less apparent than in the case of publicly held citizens' conferences.

The citizen foresight usefully contributed to the discussion surrounding 'the public understanding of science ' and has to be seen as part of a series of experiments to try new methods of public involvement. However, what its potential as a tool for more democratic decision-making on technological development (the aim stated by Dr Wakeford) is, cannot be said on the basis of this single initiative, especially given the institutional setting (as an initiative of a campaigning organisation) and the predominant conceptual framing in terms of consumer perceptions (rather than citizen participation in decision-making).

Part IV

Analyses

Chapter 11

Implementing Participatory Technology Assessment – from Import to National Innovation

Simon Joss and Helge Torgersen

Introduction

The Spread of a Concept

One feature of European participatory technology assessment (pTA) is its relative novelty. Only as recently as 10–15 years ago, there was not much discussion, let alone practice, of public involvement in policy analysis and TA. Denmark, and to a lesser extent the Netherlands, were arguably the only countries at the time that had seriously started conceptualising, and putting into practice, the issue of public participation vis-à-vis science and technology. (In the case of Denmark, this initially took the form of consensus conferences, as institutionalised by the Danish Board of Technology in 1987; in the Netherlands, it took the form of science shops and early versions of what became known there as 'constructive' TA.) Elsewhere in Europe, it was not until well into the 1990s that this issue was taken up. Following the introduction of the consensus conference in the Netherlands in 1993, other countries followed suit and started trying this particular form of public participation, including Britain (1994), Norway (1996), Austria (1997), France (1998) and Switzerland (1998). Further afield, the consensus conference was used by a variety of institutions in New Zealand (1996), the USA (1997), Japan (1998), South Korea (1998) and Australia (1999).

In parallel to the proliferation of the consensus conference throughout the 1990s, an increasing number of new methods of (public) participation were developed and tried in the European context, such as *Bürgerforen* (citizens' panels) in Germany, citizens' juries in the United Kingdom, scenario workshops and voting conferences in Denmark and various forms of 'interactive' TA in the Netherlands. The conceptual discussion of (public) pTA, too, has taken off in the last 10 years or so, with an increasing number of academics, policy analysts and social commentators pondering the issue.

Overall, then, the European experience of pTA has to date been characterised by a great deal of both theoretical and practical exploration, innovation and diversification. The initiatives analysed in the EUROPTA case studies mirror this development. Most of them represent 'introductions' in the sense that they were instigated by institutions wishing to find out what the role of public participation in policy analysis and TA may be, try particular methods and/or carry out social assessment of technological issues. In some cases, participatory methods successfully used in certain countries were transferred to other countries. In other cases, institutions developed new methods in-house, or modified existing ones to suit the particularities of the institutional and national contexts. Several of the involved institutions did not have any previous experience of participation. Some made use of participatory methods as a routine matter.

The issue of introduction merits the attention of those interested in the development of pTA and policy analysis for two broad reasons: first, it raises a number of relevant questions concerning the practical implementation of participatory methods. For example, can a method successfully used in one institutional and/or national context be transferred to another context without having to undergo significant adaptations, or do the changed circumstances require special modifications? And are there certain procedures that ease the introduction in situations where the issue of public participation evokes ambivalence or scepticism?

The European experience shows that in each country concerned, these and other questions were part of the discussion prior to the introduction of participatory methods in TA. It often took several years before an institution was sufficiently satisfied and confident that a participatory method should be tried. And as the various established TA institutions have gained more experience over the years, they have often revisited the question of introduction in connection with the development and adoption of new methods.

The second reason why the issue of introduction deserves our attention lies in its significance as an indicator of the conceptual and practical changes taking place in policy analysis and institutionalised TA. Some observers have likened the emergence of a participatory agenda, and thus the opening up of traditionally expert-oriented analyses to wider social assessment, to a 'paradigm shift ' while others remain less convinced, putting the current interest in public participation down to a temporary fashion.

While this chapter does not aspire to provide comprehensive and conclusive answers to all these questions and issues, it nevertheless tries to shed some light on the significance of the introduction of pTA in the European context, both in respect of individual methods and initiatives and in respect of wider institutional and socio-political developments. This is done by analysing relevant observations made in the 16 EUROPTA case studies, and in particular by addressing the following three sets of questions:

1 What are the implications of introduction for the individual participatory initiatives? What, if any, proactive steering measures seem advisable, in order to render a new participatory initiative effective?

2 What are the implications of introduction for the development of participation in TA, in particular where introduction signifies the first-ever use of participation?
3 What are the implications of introduction for the development of public policy- and decision-making in science and technology?

Import and National Innovation

The 16 participatory initiatives investigated in the EUROPTA case studies vary greatly in terms of methodology, institutional setting, issues considered and socio-political context. This complicates their comparative, transversal analysis. What is needed, therefore, is a relative reduction of complexity, albeit at the cost of loosing some contextual depth. For the purpose of the analysis offered here, the 16 case studies are categorised according to whether they represent an 'import' – signifying the transfer of an existing participatory method into a new national context – or a 'national innovation' – signifying the in-house design of a new method, or the new combination of elements of different, existing participatory methods. Within these categories, a distinction is made between those institutions for which participation represents a novelty, and those which have previously made use of participatory methods. Table 11.1 lists the case studies according to this categorisation.

Table 11.1 *Categorisation of EUROPTA Case Studies According to Type of Introduction*

Case study	Import	National innovation	New institutional use
Delphi AU	–	+	+
Ozone AU	+	–	+
Traffic Forum AU	+	–	+
Copenhagen Traffic DK	+	–	–
Drinking Water DK	–	+	–
Urban Ecology DK	–	+	–
Biotech Baden–W. GE	–	–	–
Discourse GMP GE	–	+	+
GM Animals NL	+	–	+
Sustainable Menu NL	–	–	–
Gideon NL	–	+	–
Novel Food NL	–	+	–
Electricity CH	+	–	+
Gene Dialogue CH	–	+	+
Plant Biotech UK	+	–	+
Citizen GMO UK	-	-	+

+ = category applies; – = category does not apply

Two of the case studies, Biotech Baden-W. GE and Sustainable Menu NL, represent neither an import nor a national innovation, as defined above. Citizen GMO UK does not represent an import or national innovation either, as the method of citizens' jury had previously been used several times in Britain, but it was set in a new institutional context.

Table 11.1 shows that there is a balance between those arrangements that were based on imported methods (six out of 13 cases) and those that were based on new methodological innovation (seven out of 13 cases). In other words, the introduction of pTA in the European context has not just been about transferring well-established methods into new national contexts, but as much about experimenting with new forms. What the relationship between these two categories is in terms of the evolution of pTA is discussed further below. Table 11.1 also shows that in five out of six 'import' cases, the organisations responsible had no previous experience of participation, whereas there was a more even balance among the cases representing 'national innovation'. Again, the significance of this is considered further below.

The Arrangement and Its Context

Before delving into the case study analysis, it is worth reconsidering briefly the interrelationship between a pTA arrangement and its institutional and wider socio-political context. Figure 11.1 schematically illustrates that relationship. In line with the EUROPTA analytical framework, the focus is on the participatory arrangement which is characterised by the multiple interdependence between the issue treated within the arrangement, the method used and the assessment resulting from the participatory process. The arrangement is set within a certain institutional context which, in turn, is embedded in a socio-political environment of one kind or another.

The (institutional and wider social) context of the arrangement can be characterised in terms of various factors that have a bearing on the actual role of a participatory arrangement and, vice versa, are themselves influenced by the arrangement (indicated in Figure 11.1 in the form of arrows). These include, for example, the position of the institution responsible for the pTA arrangement relative to other institutions and the policy- and decision-making processes; the conceptual development, and standing, of TA within the wider socio-political setting; and the nature of debate and policy-making concerning the issue treated in the participatory arrangement. Depending on the situation in which a participatory arrangement is placed, these or other factors may play a more or less influencing role. In one situation, for example, a participatory arrangement may be primarily shaped by the issue-related debate, whereas in another situation, intra-institutional motives unrelated to the issue at stake may chiefly influence the role of the arrangement. In another situation, it may be a combination of various factors that determines what a participatory arrangement effectively stands for.

By introducing and implementing pTA – whether in the form of 'import', or 'national innovation' – the organisations concerned pursue certain goals. Inquiring about the motives of these organisations should help identify the relevant contextual factors prompting the participatory arrangement and analyse the functional relationship between these factors and the arrangements. In turn, this should help discuss the actual role played by the pTA methods and, thus, the significance of introduction.

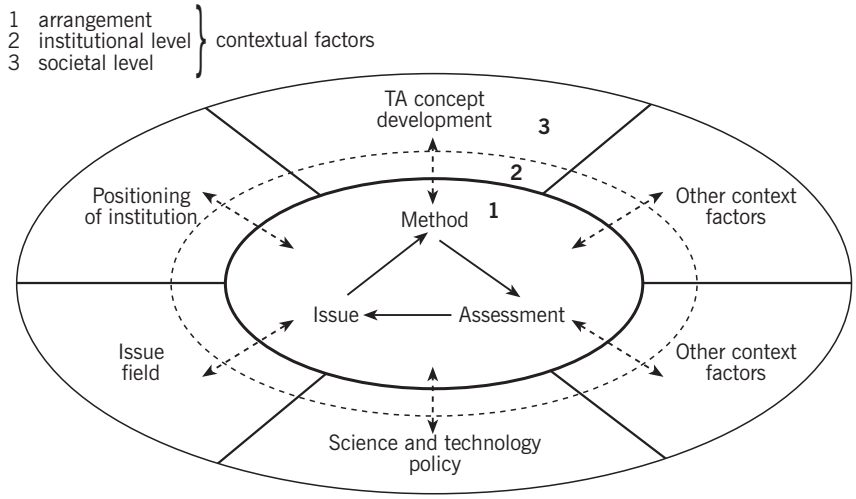

Figure 11.1 *The pTA Arrangement and Its Context*

'Import'

Among the six case studies falling under the category of 'import', four are consensus conferences, one is a future search conference and one a citizens' panel (see Table 11.2). Apart from the future search conference, these arrangements were all held by institutions with no previous experience of pTA. In several cases, two or more institutions teamed up for the organisation of the arrangements. The Austrian tropospheric ozone consensus conference (1997) was organised by the City of Vienna Environment Agency in collaboration with the public authorities of two neighbouring regions. The Dutch public debate on transgenic animals (1993) was carried out jointly by the Dutch national TA institution (NOTA; now the Rathenau Institute), the Foundation for Public Information on Science, Technology and the Humanities (PWT) and the consumer research organisation SWOKA. The organisation of the British plant biotechnology consensus conference (1994) was shared between London's Science Museum and one of the national research councils, the Biotechnology and Biological Sciences Research Council (BBSRC).

The four consensus conferences were the first ones held in the four countries concerned (and in fact the first public pTA arrangements altogether). They were all based on the Danish model of consensus conference. It is appropriate in this context to refer to the Danish consensus conference method as a 'model', as by the early 1990s, when the method began to be used outside Denmark, it had acquired paradigmatic status – that is, it was discussed internationally as a model of what public pTA may look like.

As it happened, this model character was a decisive factor driving the introduction of the consensus conferences discussed here. In all four cases, the consensus conference was not just chosen because the method as such had

Table 11.2 *'Import' Case Studies*

Case study	Imported method	Organisation	Institutional characteristics	New institutional use of pTA
Ozone AU	Danish consensus conference	Vienna Environment Agency	Public inter-organisational	Yes
GM Animals NL	Danish consensus conference	NOTA; PWT; SWOKA	Public/private inter-organisational	Yes
Electricity CH	Danish consensus conference	Swiss Science Council	Public national TA organisation	Yes
Plant Biotech UK	Danish consensus conference	BBSRC Science Museum	Public inter-organisational	Yes
Traffic Forum AU	German citizens' panel	City of Salzburg	Public/Local government	Yes
Copenhagen Traffic DK	US future search conference	Danish Board of Technology	Public national TA organisation	No

Notes: NOTA = Dutch national TA institution, now Rathenau Institute; PWT = Foundation for Public Information on Science, Technology and the Humanities; SWOKA = Dutch consumer research organisation; BBSRC = Biotechnology and Biological Science Research Council; TA = technology assessment; pTA = participatory TA. Public/private = public/private sector organisation)

over the years proven to work well in Denmark and thus yielded valuable practical experience that could be passed on to organisations in question. Of equal (if not more) importance, it was chosen because it represented innovation driving the conceptualisation of (participatory) TA. In other words, one of the aims of importing the consensus conference was to emulate the Danish experience and induce a process of developing a participatory agenda in (national) TA.

This can be seen, for example, in the Dutch conference on transgenic animals (GM Animals NL), which NOTA's staff saw as a vehicle to try out public participation in an attempt to re-orientate its TA activities. Again, it can be seen in the Swiss PubliForum (Electricity CH), which was inspired by the Danish (and to a lesser extent the other European and overseas) experience, and which sought to conceptualise Swiss TA away from exclusively expert-oriented, and towards wider social, assessment. It can also be seen in the British plant biotechnology conference, although here the motivation was to bring about conceptual innovation in the 'public understanding of science' movement, rather than in TA itself.

As a feature of 'import', the novel use of a participatory method (such as the consensus conference) to induce conceptual and methodological innovation means that that method takes on something of a different functional role in its new setting than the one inherent in the method itself. A comparison of the use of consensus conferences in Denmark with the 'import' cases discussed here explains why.

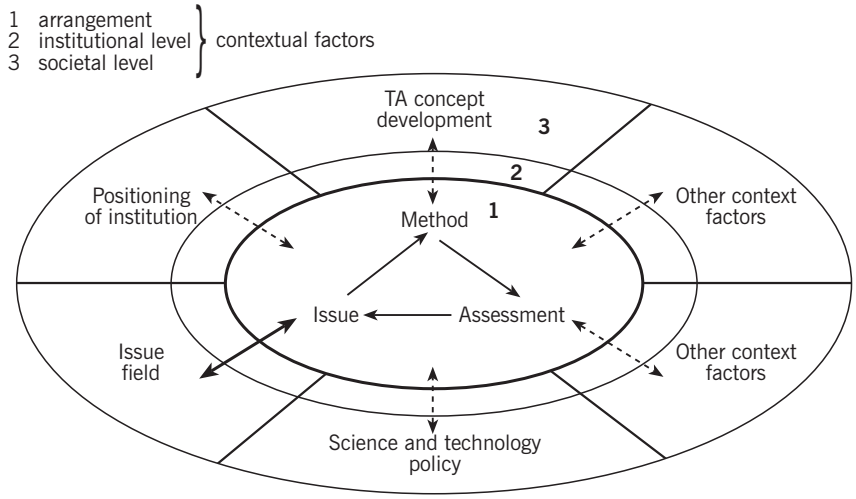

Figure 11.2 *Issue-driven Use of Consensus Conference and Future Search Conference in the Danish Context*

Denmark: Issue-driven Use

At the Danish Board of Technology, the consensus conferences are used instrumentally as a method to carry out certain types of assessment. The decision to make use of the consensus conference method typically follows an elaborate, annual procedure of identifying issues to be assessed, characterising the main aspects of these issues ('the problem'), and deciding who the main 'customers', or 'target groups', of the assessment are. In other words, the consensus conference method (as any other method used) is chosen if and when it is deemed suitable for dealing with a specific issue that is up for assessment. This we may call 'issue-driven' use. Other contextual factors, such as the furthering of the institutional standing or conceptual development, may also influence the choice of method, but they are more peripheral. Figure 11.2 illustrates this issue-driven use of consensus conferences in Denmark.

The reason for this kind of instrumental use lies in the fact that the consensus conference method is a well-established, accepted working method of the Danish Board of Technology. The method's aims – namely to carry out social assessment, further public debate and give input into public policy- and decision-making – reflects the remit of the Board of Technology, and more generally, the Danish understanding of institutionalised TA. There is, therefore, a close correspondence between the consensus conference as a particular method of assessment, the working of the Board of Technology and the Danish conceptualisation of TA. Because of this correspondence, the use of a consensus conference has less to do with the conceptual development of TA, and more with issue-focused assessment.

It should be mentioned that in the mid-1980s, when the consensus conference method was used for the first couple of times by the Danish Board of

Technology, it also had a conceptual function of developing TA, beyond the issue-specific role. There was considerable uncertainty about the appropriate use of this method in more than one quarter (see, for example, Joss, 1998a). As, however, the Board of Technology managed to consolidate its position in the late 1980s and early 1990s, the method became increasingly seen as something 'normal', a part of Danish TA.

It is worth noting that the Board of Technology's import of the future search conference method was also largely issue-driven (Traffic Copenhagen DK). The Board had decided to carry out a project on the issue of urban traffic (relating to Copenhagen). A main characteristic of the issue was perceived to be the 'blocked' situation in the debate about how best to tackle the problem of increasing private motorism in large cities. The various social actors involved appeared intransigent in their perspectives and positions, with little substantive progress made on relevant policy. The future search conference, which aims to overcome intransigent relationships among different social actors, was judged to be the right method for this issue. To be sure, the Board of Technology was also interested in trying this new method, but it only did so following careful analysis of its compatibility with the issue at stake.

Britain, the Netherlands, Switzerland: Concept-/Method-/Institution-driven Use

In comparison to the Danish Board of Technology's use of consensus conferences and the imported future search conference, the British, Dutch and Swiss consensus conference imports were not primarily issue-driven, but a mixture of what may be referred to here as 'concept-driven', 'method-driven' and 'institution-driven'. While in Denmark, the type of issue is central to the choice of method, in these cases first the principled decision was taken to hold a consensus conference, and only then was an issue identified for treatment in the conference. The reason, for example, for choosing transgenic animals as a theme in the Dutch public debate was said to have been the fact that NOTA had already carried out several expert assessments on this and related issues, thus providing background information that would come in handy in the conference organisation. In Britain, plant biotechnology was chosen – once the decision had been made to hold a consensus conference – on the grounds that it was not as controversial as animal biotechnology. (Since the conference was sponsored by the BBSRC, the issue had to do something with modern biotechnology.) The BBSRC argued that, in order to see whether the method would work in the British context, an issue should be chosen which was not too problematic and 'hot', as far as public debate was concerned.

What, then, was primarily at the centre of the decision to import the consensus conference model, was the motivation to induce the further conceptual development of TA (or, in the British case, the public understanding of science) and to try a new method. This motivation was enhanced by the concurrent aim to improve the standing of the organisations responsible for

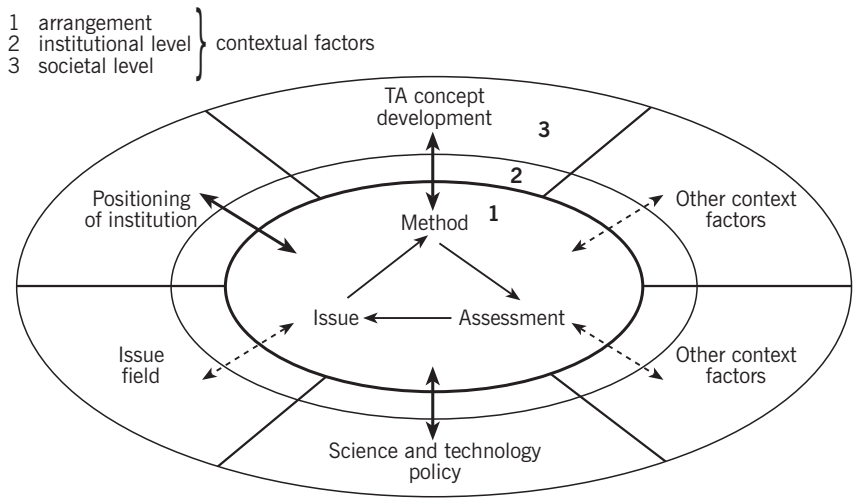

Figure 11.3 *Non-issue-driven Use of Consensus Conferences in 'Import' Cases*

holding the conferences ('institutional profiling'). In Britain, for example (Plant Biotech UK), the BBSRC had been asked, alongside the five other research councils, to start up 'public understanding of science' (PUS) activities, as a result of a governmental decision in 1993 to make PUS part of official research policy. The Science Museum, on its part, was interested to develop PUS further, in response to criticism that the movement was too elitist and expert-driven. In the case of the Dutch conference (GM Animals NL), NOTA was hoping to get more widely known, as it was perceived to be known only to a relatively small community of policy analysts. Equally, PWT saw the conference as a good opportunity to translate its remit into practice. In Switzerland, the national TA programme at the Swiss Science Council was still relatively new when the decision was taken to hold a consensus conference, and one of the aims of the PubliForum (Electricity CH) was to make the programme better known to a wider audience both in politics and the wider public.

This concept-, method- and institution-driven use does not mean that the choice of issue did not matter. Selecting an appropriate theme for treatment in a consensus conference is obviously important, in order to use the conference as a means of bringing about conceptual and methodological innovation. Considerable thought went into the choice of issue (more so, it would seem, in Switzerland than in Britain and the Netherlands), but this was nonetheless secondary to the principled choice of the consensus conference as a TA project.

Figure 11.3 illustrates the aforementioned contextual factors that lay behind the import of the consensus conference model in Britain, the Netherlands and Switzerland. Comparing Figures 11.2 and 11.3, then, shows that there is a difference of emphasis between the Danish cases, on the one hand, and the British, Dutch and Swiss cases, on the other, as far as the

contextual factors that drove the use of the participatory arrangements are concerned. This difference is mirrored in the actual roles reported in the case studies. While in Denmark, the future search conference's function was said to have been mainly in relation to the issue (as has been the function of most consensus conferences, as reported elsewhere; see, for example, Klüver, 1995; Joss, 1998b), in Britain, the Netherlands and Switzerland the role of the consensus conferences was said to have been, through the treatment of specific issues, mainly in relation to the conceptualisation and methodological development of pTA and institutional profiling.

The British case, for example, showed that the conference had hardly had any substantive effect on the (social) assessment of plant biotechnology and the related policy debate (let alone policy-making). It did, however, turn out to have considerable effect on the development of the official public understanding of science initiative and the discussion of science and technology policy. In the Netherlands, too, the conference was reported to have had little impact on policy-making relating to transgenic animals (especially since the conference had taken place after a relevant decision on the issue had been taken in Parliament). Again, however, it was reported to have been something of a turning point in Dutch TA development.

Considering the institutional situation of the cases concerned, it appears that the import of a participatory method into a well-established institutional context with existing experience of pTA, such as in Denmark, is mainly issue-related, both in terms of the underlying motivation of the organisers and the actual role of the arrangement. In contrast, an import into an institutional and societal context with limited or no such prior experience, such as in Britain, the Netherlands and Switzerland, is less issue-related and more concept-, method- and institution-related.

This shift of emphasis does not seem to be problematical in the sense that an import into a new environment does not render the participatory arrangement less useful than its deployment in an existing pTA context; it simply means a relative shift of function. So, while arguably not greatly influencing the substantive, issue-related assessment and discussion, the British, Dutch and Swiss consensus conferences nevertheless appear to have functioned as important driving forces regarding (national) TA development.

At the same time, however, this shift of emphasis may be problematical, so far as the issue-related assessment is concerned: those participating as experts or citizens in the reported consensus conferences did quite naturally have considerable expectations (of one kind or another) vis-à-vis the issues discussed. While for the organisers a relative lack of issue-specific relevance of the imported method, although disappointing, is made up by the conceptual, methodological and institution-specific relevance, for participants such a lack may be more serious. The evidence of the case studies does in fact point to this problem. In Britain, for example, both experts and lay panellists complained that the issue did not seem to fit into wider debate, and the assessment resulting from the conference was not subsequently taken up by the relevant policy-making institutions – that is, the aim of carrying out social

assessment and policy advice, inherent to the consensus conference model, had not really been achieved. It would seem important, therefore, that this (potential) problem is borne in mind when importing a participatory method into a new context.

Austria: Issue-driven Use in New Institutional Context

The Austrian consensus conference (Ozone AU) and the Traffic Forum AU in Salzburg are interesting cases not least because they represent an issue-driven use of imported participatory methods in institutional contexts with no prior experience of pTA. Neither was linked to a TA institution (both were local government bodies); thus they were not utilised to drive the conceptual development of pTA. Arguably, they may be said to have been used for methodological innovation, but only to the extent that this furthered the aim of carrying out issue-specific policy assessment.

This absence of a clear concept- and method-driven motivation, therefore, seems to have been due to the particular institutional settings of the two arrangements. In addition, it may also have been due to the apparent lack of interest in the issue of (this kind of) public participation in the Austrian socio-political context. Consequently, the organisers may have concluded that emphasising the conceptual dimension of public participation could reduce the chances of the imported methods gaining (political) credibility as a means of achieving effective policy analysis.

Interestingly, the reported limited issue-related effectiveness of the two cases (despite their issue-driven underlying rationale) may precisely have had to do with the fact that they were set within institutional contexts that were not used to pTA methods as a form of policy analysis and advice. By the same token, the lack of concept- and method-related innovation drive appears to have prevented the two arrangements from having a noticeable effect, beyond the arrangements themselves, as initiators of pTA development. Furthermore, by more or less leaving aside the conceptual dimension within an institutional context of relative inexperience of public participation, the two cases risked falling victim of political instrumentalisation. The consensus conference, for example, was used (at least in parts) by the regional authorities involved as a means of putting pressure on federal government to implement a tropospheric policy programme.

In conclusion of the above analysis, the introduction of pTA in the form of 'import' can be tentatively summarised as follows (see Table 11.3, for comparison): in situations with no prior experience of participation, the import of a participatory method is often strongly motivated (on the part of the organisations involved) by the aim to further the conceptual and methodological development of TA. As a consequence, the arrangement's issue-related function is somewhat limited (see British, Dutch and Swiss case studies). In contrast, the import of a participatory method in a context where there is an existing, positive experience of participation, the arrangement's motivation is

Table 11.3 *Motivations/Intentions of 'Import' of Participatory Methods*

Case Study	Issue-driven	Concept-driven	Method-driven	Institution-driven
Ozone AU	++	++	+++	++
GM Animals NL	+	+++	+++	+++
Electricity CH	+	+++	+++	+++
Plant Biotech UK	+	+++	+++	+++
Traffic Forum AU	+++	+	+	++
Copenhagen Traffic DK	+++	+	+++	+

Notes: + = limited; ++ = moderate; +++ = important/main

more issue-driven (and less concept-driven), as is its actual role (see Danish example). Finally, an import of a participatory method in a context with no relevant previous experience may show comparatively little effectiveness if the use of the method is issue-driven, with no, or only little, motivation to induce conceptual and methodological innovation.

Import as a Means of Overcoming Resistance

The issue-, concept-, method- and institution-driven motivations underlying the import of participatory methods of TA have been explained in the previous sections with the status of the organisations involved (whether they have existing experience of participation or not, whether they are TA institutions or not etc.).

Additionally, the EUROPTA case studies discussed here point to another aspect that helps explain the phenomenon of import: (institutional) resistance towards pTA. It would appear that where there is considerable resistance, either within or outside the organisation concerned, the import of an elsewhere well-established, tried participatory method can help overcome that resistance.

Take the example of the British consensus conference. The idea of public participation was met with resistance both from within the organisation (especially on the part of the BBSRC, which would probably not have committed itself to funding the conference had it not been for the great enthusiasm of its chief executive, which outweighed the relative reluctance by the middle management) and from influential sections of the political system (several representatives of which let it be known to the organisers that such TA had not much of a place in the British political system; if anything, it would have to be directed at public debate). Using the consensus conference model, the organisers could refer to the Danish experience, thus reassuring the sceptics that this was a well-established, respectable method of public participation. Following the conference, the earlier resistance seemed to abate somewhat (though not completely), and the discussion of the role of pTA in the British context became more relaxed and pragmatic.

In the Swiss case, too, the fact that the PubliForum was modelled on the Danish consensus conference helped 'break the ice'. There were lingering doubts in certain quarters within the Swiss Science Council about the useful-

Table 11.4 *Resistance and Individual Push in 'Import' Cases*

Case study	Resistance	Individual push
Ozone AU	+	(+)
GM Animals NL	+	+
Electricity CH	+	+
Plant Biotech UK	+	+
Traffic Forum AU	–	+
Copenhagen Traffic DK	–	–

Notes: 'resistance' = resistance towards pTA within and/or outside organising institution; 'individual push' = enthusiasm of individual(s) relevant for driving import; – = low; + = medium to high

ness of public participation as a form of TA. The reference to the long-standing Danish and other foreign experiences helped overcome such doubt. In wider public debate (as reflected, for example, in media reports), too, the knowledge that the consensus conference was used as a matter of course elsewhere helped the argument in favour of trying out the method in Switzerland.

Resistance was also reported in the Dutch case study, where it was noted that NOTA's board of governors did not at first want to sanction the use of the consensus conference method, arguing that this did not represent proper TA. (The board could eventually be won over, after PWT had agreed to act as co-organiser.) NOTA's staff, however, had attended a consensus conference in Denmark (notably on transgenic animals) and reported back that it seemed to work there. In retrospect, that conference was said to have been a turning point in Dutch TA, which has since developed a strong participatory tradition.

Table 11.4 gives an indication of the 'resistance' dimension. Not surprisingly given the long-standing experience of pTA and the issue-related emphasis in Denmark, the future search conference is the one example in the category of imports that appears to have met with the least amount of resistance.

The Swiss, Dutch and British cases also show that where there is resistance towards public participation in TA, the introduction of participatory methods is made easier if there are enthusiastic individuals who push for an import.

In summary of the analysis of 'import' cases, the following three overall observations can be made: first, 'import' as a form of introduction has been shown to be quite useful as a process of inducing conceptual innovation in (participatory) TA, both at the methodological and the institutional level. This is particularly the case where there is a need for a 'role model' – that is, where pTA is as yet not well-established and accepted, and where there may be considerable resistance; in short, where the climate is not entirely ready for 'going it alone' (say, by designing one's own method). In this situation, importing a participatory method is particularly attractive, since, on the one hand, it has been shown to work elsewhere and, on the other, it comes with a certain built-in role that can be (tried to be) emulated. Import, in this context, may also help induce institutional change and re-orientation. Again, the reference

to 'success' in other institutions can help overcome resistance. However, the issue-related function of such imports may be rather limited.

Secondly, where a participatory method is imported into a well-established pTA context, the above observation does not hold: the import here is not so much about institutional profiling and conceptual development. Instead, the import serves the issue-related use of a method. In other words, the aims inherent in the method are more specifically applied to the issue under consideration.

Finally, the import of a participatory method by institutions with no previous experience in the field seems least effective if the import is not linked to a conceptual and methodological debate (within the organisation and beyond) about the issue of public participation. Furthermore, in the absence of a proper conceptual basis, such import risks being instrumentalised for political purposes.

What lessons can be learnt from these observations in terms of the design and use of pTA methods? This question is addressed in the concluding section of this chapter. First, the 'national innovation' cases need analysis.

National Innovation

Compared with the 'import' case studies, among the cases featuring under the category of 'national innovation' there is more conceptual, methodological and institutional variety. Table 11.5 summarises the main characteristics of these various cases, which have in common that they represent participatory methods that were either designed entirely from scratch or by combining elements of different existing TA methods.

The two Dutch arrangements, Gideon NL and Novel Food NL, were based on what in the Netherlands has been conceptualised as 'interactive TA', and 'consumer constructive TA', respectively (for information on these concepts, see Grin *et al.*, 1997, and Hamstra, 1995). Both arrangements were a combination of participatory methods with conventional TA methods. They were part of two larger projects involving stakeholder as well as consumer groups. They differed from one another in relation to their respective aims, conceptualisations and institutional embedding. The concept of the Novel Food NL project was designed by STD, a governmental programme that acquired the status of a temporary 'think tank' to promote sustainability, and realised by SWOKA. The Gideon NL project was arranged by the Rathenau Institute.

The Urban Ecology DK arrangement was carried out by the Danish Board of Technology. It was based on the scenario workshop method, which the Board of Technology had not used before. In designing the scenario workshop method, the Board of Technology was inspired by the method of future workshop (*Zukunftswerkstätte*), which had been developed in Germany by Robert Junk *et al.* (see, for example, Bischoff *et al.*, 1996). The scenario workshop distinguishes itself from the future workshop method in respect of, among other things, the number of localities involved (four local workshops,

Table 11.5 *'Innovation' Case Studies*

Case study	Method	Organisation	Institutional characteristics	New institutional use of pTA
Delphi AU	Delphi	ITA	Public national TA organisation	Yes
Drinking Water DK	Voting conference	DBT	Public national TA organisation	No
Urban Ecology DK	Scenario workshop	DBT	Public national TA organisation	No
Discourse GMP GE	Stakeholder discourse	WZB	Public scientific research organisation	Yes
Gideon NL	Interactive consumer TA	Rathenau Institute	Public national TA organisation	No
Novel Food NL	Future visions on consumers	STD SWOKA	Public governmental think tank Consumer research organisation	No
Gene Dialogue CH	Citizens' panel	*Ad hoc* project committee	Public inter-organisational	Yes

Notes: ITA = Institute of TA, Austrian Academy of Sciences; DBT = Danish Board of Technology; WZB = Wissenschaftszentrum Berlin; STD = Interdepartmental Research Programme on Sustainable Technology Development; SWOKA = Dutch consumer research organisation; public/private = public/private organisation

rather than just one) and the type of interaction among participants (exchange of views between participants of all four workshops, as well as within each local workshop). Like the imported future search conference (Copenhagen Traffic DK), the scenario workshop represents the use of a new participatory method within an institutional context with ample experience of pTA. So does the voting conference (Drinking Water DK), which was designed by the Danish Board of Technology from scratch.

The Delphi AU was a blending of the established, expert-focused method of technology foresight with certain participatory elements. It was carried out by the Vienna-based Institute of Technology Assessment (ITA), a national TA organisation based at the Austrian Academy of Sciences. As the ITA has traditionally been geared more towards the 'classical', expert-oriented model of TA, the Delphi project represented new methodological innovation. The Gene Dialogue CH project embodied yet another methodological approach to public participation. It combined lay participation (based on the consensus conference model) with stakeholder participation (loosely based on the model of co-operative stakeholder discourse). It was instigated by a Member of the Federal Parliament and organised by an *ad hoc* coalition of prominent individuals and institutional representatives working (more or less closely) with issues relating to genetic testing.

Finally, the Discourse GMP GE initiative on genetically modified plants (GMP) also falls under the category of national innovation. It was designed as a social science research project, which actively involved various stakeholders

in the assessment of aspects of risk relating to the release of genetically modified crops into the environment. It was coordinated by the Berlin Science Centre (*Wissenschaftszentrum*), with the support of other research institutions.

In summary, some of the participatory methods featuring under 'national innovation' combined lay and stakeholder participation (Drinking Water DK, Urban Ecology DK, Gene Dialogue CH). Others involved stakeholders only (Delphi AU, Gideon NL, Novel Food NL, Discourse GMP GE). Interestingly, the term 'stakeholder' was defined more or less broadly in these cases, thus involving various kinds of social actors (in Novel Food NL, for example, consumers participated as stakeholders, whereas in Discourse GMP GE only professional interest groups were involved). In three cases, the institutions responsible made use of participatory methods for the first time (Delphi AU, Discourse GMP GE, Gene Dialogue CH), while the Danish and Dutch organisers had previously used participatory methods.

Issue-driven Use

The analysis in the previous section showed that, depending on the level of institutional, and wider national, experience of participation in TA, the import of a participatory method can be more or less issue-, method-, concept- and/or institution-driven. Roughly, an imported participatory arrangement tends to be more concept- and method-driven when instigated by an institution with no prior experience, while an arrangement is usually more issue-driven when imported by an organisation with existing experience of public participation.

Interestingly, as far as the national innovation case studies are concerned, this observation does not fully hold (see Table 11.6). Across the institutional spectrum covered by the cases concerned, the motivations behind, and the aims of, the various arrangements appear to have been largely issue-driven. Regardless of whether or not the institutions responsible had experience of holding participatory initiatives, these cases were primarily designed and organised around the issues chosen. Needless to say that method-, concept- and institution-related motivations did also come into play, but these were secondary to the issue-related aims. With respect to our figures in the previous section, the national innovation cases thus followed a pattern similar to that of the issue-driven consensus conferences in Denmark (see Figure 11.2 in the previous section on imports).

Take the examples of Gideon NL and Novel Food NL arrangements. Here, participation was integrated into the assessment first and foremost as an instrumental tool to enable a certain kind of analysis. The Gideon initiative, for example, aimed at analysing and developing various policy options regarding the furthering of sustainable crop protection practice, for which the perspectives and assessments of relevant social actors were sought.

The national innovation cases, then, were generally less about the normative-conceptual and methodological development of participatory policy

Table 11.6 *Motivations/Intentions of 'Innovation' Cases*

Case study	Issue-related	Methodological	Conceptual	Institution-related
Delphi AU	+++	++	+	+
Drinking Water DK	+++	+++	+	+
Urban Ecology DK	++	+++	+	+
Discourse GMP GE	++	++	++	+
Gideon NL	+++	++	+	+
Novel Food NL	+++	++	+	+
Gene Dialogue CH	++	++	++	++

Notes: + = limited; ++ = moderate; +++ = important/main

analysis and TA per se. In this respect, Gene Dialogue CH was something of an exception: although it was strongly issue-driven – it was designed to fit into the official process of stakeholder consultation in relation to proposed new legislation on genetic testing – it also aspired to explore new methodological ways of extending stakeholder dialogue and consultation.

The three national innovation cases held by organisations with no prior experience of participation (Delphi AU, Discourse GMP GE and Gene Dialogue CH) were also less about enhancing institutional standing compared with the import cases held by institutions with no experience. The Austrian Institute of TA made use of a participatory methodology because this was deemed to suit the aim of the technology foresight exercise. As the issue of (citizen) participation in TA has not been particularly favoured in Austria, its strategic use as a means of institutional profiling could even have backfired.

In the case of the Discourse GMP GE arrangement, this was conceived of as a social science research project, which fitted in well with the Berlin Science Centre's role as a reputable research establishment. Hence, institutional profiling was not much of an issue (though the project managers may well have sought to enhance their personal reputation). Institutional positioning was also no particular motivation behind Gene Dialogue CH, as it was organised by a broad coalition of interested parties which dissolved once the initiative had been accomplished. It seemed, however, to have been motivated by the long-standing interest of its instigator, a Member of the Federal Parliament, to make a contribution to the development towards greater public participation in science and technology policy analysis.

Why National Innovation?

As far as the four national innovation cases held by experienced institutions are concerned (Drinking Water DK, Urban Ecology DK, Novel Food NL, Gideon NL), these pursued the aim of trying new methods, though not as a goal in itself, but as a means of achieving a particular, issue-related assessment. These cases, then, indicate that with growing institutional experience, in the course of which participation seems to assume more of an issue-related instrumental role (and less of a conceptual one), new participatory methods

are increasingly designed in-house, thus making them directly responsive to the kind of analysis sought.

The three other national innovation case studies (Delphi AU, Discourse GMP GE and Gene Dialogue CH), however, also show that those institutions with no prior experience of participation succeeded – albeit perhaps in less sophisticated ways – in designing new participatory forms, too. Why did the latter not import existing methods instead, which might be considered a 'safer' way of introducing pTA?

There seem to be two kinds of reasons why an institution with no prior experience of pTA should choose to design its own participatory method. One is that because the issue of participation in TA has already been explored by other institutions in the same national context, the institution in question receives sufficiently broad support, and thus feels confident enough, to come up with an in-house, issue-tailored method. The Gene Dialogue CH is a case in point: it was carried out following the successful, first use of a pTA arrangement – namely the Swiss Science Council's PubliForum (Electricity CH). The organisers were inspired by the PubliForum and used it as a point of reference, stating in which respect the Gene Dialogue differed from the PubliForum. It is likely that several of the 17 institutions making up the *ad hoc* organisation would not have agreed to back the Gene Dialogue initiative had not the reputable Swiss Science Council led the way with its arrangement. At the same time, the Member of Parliament instigating the dialogue initiative – whose advocacy for the initiative was essential to get it off the ground – did not simply wish to duplicate the PubliForum, but blend different methodological elements (lay and stakeholder participation) to suit the analysis of the issue of genetic testing within the context of public consultation relating to law-making.

The other reason – manifest in the Delphi AU and the Discourse GMP GE arrangements – is that by coming up with a method of its own, an institution can adapt participation to suit a particular cultural/national context, thus overcoming possible (external) resistance. The Austrian Institute of TA would reportedly have stood little chance of importing, say, the consensus conference method, given the sustained reluctance of the relevant institutions to consider lay participation in policy analysis and TA. Instead, modifying a conventional method (the technology foresight) with stakeholder participation to suit a particular analytical goal allowed the Institute of TA to explore indirectly the issue of participation. Put differently, opting for a more moderate, system-friendly type of participation – as stakeholder participation arguably is compared with lay participation – may be the only way open to introducing participation in situations where the import of foreign, 'system-alien' methods of participation would otherwise be too strongly resisted.

For the above reasons – existing familiarity with the issue of participation, as in the Danish, Dutch and Swiss examples (Drinking Water DK, Urban Ecology DK, Novel Food NL, Gideon NL, Gene Dialogue CH), or system-friendly adaptation, as in the Austrian and German examples (Delphi AU, Discourse GMP GE) – the level of resistance against the idea of pTA generally

Table 11.7 *Resistance and Individual Push in 'Import' Cases*

Case study	Resistance	Individual push	New institutional use of pTA
Delphi AU	(–)	–	Yes
Drinking Water DK	–	–	No
Urban Ecology DK	–	–	No
Discourse GMP GE	(–)	+	Yes
Gideon NL	–	–	No
Novel Food NL	–	–	No
Gene Dialogue CH	(–)	+	Yes

Notes: 'resistance' = resistance towards pTA within and/or outside organising institution; 'individual push' = enthusiasm of individual(s) relevant for driving import; pTA established = previous pTA experiences in the country; – = low; (–) = some; + = medium to high

appears to have been lower in the national innovation cases than in the import cases (see Table 11.7 and Table 11.4, for comparison).

As national innovations tend to be more issue-focused and the level of resistance may be less pronounced compared with imports, their actual role could be expected to be more directly issue-related. This appears to have been the case as far as the relevant EUROPTA arrangements are concerned. Even in the case of Discourse GMP GE, which was reported to have been fraught with methodological and procedural problems and which did not have a link to relevant policy-making, the arrangement's role was reported to have been predominantly issue-related.

In summary, the national innovation category covers various kinds of participatory arrangements: from the completely newly developed method, such as the voting conference (Drinking Water DK), to the cautious modification of conventional assessment tools, such as the participatory technology foresight (Delphi AU); and from the arrangement involving a broad range of stakeholders (including lay people), such as the scenario workshop (Urban Ecology DK), to the one involving professional interest group representatives only, such as the Discourse GMP GE.

Compared with the import cases, these arrangements are mostly issue-driven, and less so concept-, method- and institution-driven. This seems to be, on the one hand, the result of institutional and wider national experience – as in the Danish, Dutch and, to a lesser extent, the Swiss cases – where participation has assumed a reasonably normal status as one of various tools of policy analysis and TA, and thus the focus of attention is on the issues under consideration. On the other, it seems the result of a cautious, slow approach to opening up expert-oriented assessment – as in the Austrian case – where participation is still largely considered incompatible with the prevailing system of policy analysis and TA, and thus its introduction is best achieved by rendering it directly functional to the issue-related assessment. In the latter case, stakeholder participation seems more viable as a way of opening up conventional assessment procedures, as this is more 'system-friendly' than lay/citizen participation which often acts as a counter-point to expert analysis. For the above reasons, then, external resistance against the idea of pTA was generally lower than in most imports cases.

Conclusions

Ten, fifteen years ago, there were many doubting voices about the feasibility of public participation in policy analysis and TA. The idea of participation was mostly critically commented on, dismissed as unrealistic, and more often than not actively resisted by relevant institutions and commentators. It often took a great deal of enthusiasm of individuals for a participatory initiative to be set up and implemented successfully. And yet, 10 years on and the European landscape of policy analysis and TA seems to have changed remarkably. While only a decade ago, there were just a small number of institutions actively pursuing participatory initiatives, nowadays there are dozens of organisations and individuals engaging in such activities. To be sure, there are still critical voices, and public participation is by no means fully established in institutional TA; but the issue has certainly moved more centre stage.

An important finding of the EUROPTA analysis is that the introduction of pTA in various national and institutional settings has actually worked rather well. With the benefit of hindsight, this may seem like stating the obvious, but in the past there were many who insisted that participation had no place in science and technology policy analysis or simply could not work. The latter view seems to have been confounded.

The analysis in this chapter shows that, in most of the cases, participatory arrangements could be carried out more or less as intended. No doubt, the institutions involved faced various kinds of difficulties, but these appear to have been due as much to managerial problems (such as short timing, limited funding, and insufficient participant recruitment) as to system-inherent incompatibilities (such as lack of participatory tradition, expert-dominated policy-making, and institutional resistance). What seems pivotal in order for pTA to be taken up by countries and institutions with no prior experience in the field is the dedication and willingness of either individuals or institutions to try this, against whatever odds. Such preconditions are given, as several EUROPTA cases show, when there is considerable pressure brought to bear on the system of policy analysis and TA to open up and re-orientate itself, and/or when other institutions and countries can point to positive experiences.

As a broad generalisation, the analysis of the EUROPTA cases suggests two different ways in which pTA has entered the various national scenes. On the one hand, the institution responsible chose to import an established and well-proven method, mostly the model of the consensus conference. This proved to help considerably in initiating a process at the end of which it became obvious that trying pTA is worth the effort. It was a 'safe bet' since the institution could legitimately point at successful applications of the method in other countries. This proved to be a valuable asset, especially in situations where there was no existing experience in a country or within an institution. However, importing an established method proved to entail a relative shift of aims: whereas the pTA arrangements in the country of origin

made use of the method in an issue-related way, those in the importing countries mostly emphasised concept-, method- or institution-related aspects. This is not a problem as such; it just means a relatively different role of the respective arrangement as compared with the country of origin. It also means that this shift of roles has to be taken into account if an import is considered in order to initiate the introduction of pTA in a country.

Clearly, import can help to overcome resistance and scepticism. In countries where decision-making, and also, often mirroring its political culture, TA tend to be rather expert-oriented, the import of a method that had already proven to 'work' in other places served to 'break the ice'. In order to do so, a certain challenge might have been necessary to open up for new approaches. In the case of the consensus conferences, this challenge was often the involvement of lay people in TA, as well as the methods' main orientation towards the general public.

On the other hand, if the institution responsible was too opposed to lay pTA, the import of such a method would not work. On the contrary, it needs a certain dedication from the side of the institution, and often from individuals in particular, to carry through the idea of pTA against resistance and scepticism. Where a country, or a responsible institution, would not be ready for an 'import' and the challenges it would entail – that is, where resistance to the idea of pTA is still quite high – careful, step-by-step adaptation and modification of established, more traditional TA methods, linked to the issue at stake, might be the only way of slowly opening up the system to participation. In the latter case, participation tends to start off as stakeholder involvement, as this is more closely related to traditional, expert-style analysis within TA, and it is easier to orient the assessment towards a more restricted public or professional arena. In many cases it is easier to convince sceptics of the merits to gradually widen the range of those that (legitimately) may have a stake in an issue as compared with arguing for lay participation.

If an arrangement has finally been carried out, and, especially, if established and well-respected institutions and/or individuals endorse participation in TA, then the further development of pTA may follow. This marks the second step in national innovation: after one or several successful 'imports' have taken place, the climate in the particular country may have grown more conducive to pTA, which then allows for carefully designed experiments. Such 'experimental' national innovation presupposes a certain amount of institutional confidence; where this is high, totally new methods can be developed, which tend to be issue-focused.

This generalisation of (two possible) introductory modes should not be understood too rigidly, as the reasons behind the decisions to go down one or the other way are far more complex and related to specific national, institutional or even individual circumstances. The analysis, therefore, cannot offer definitive practical guidance as to whether an institution wishing to start using pTA should import or design a method itself. As the analysis of the variety of approaches taken in the EUROPTA cases has shown, there is no such thing as

the golden way to successfully introducing and implementing pTA. However, there is a lesson to learn from the various cases: even if the approaches may differ, one common and essential precondition for the introduction of pTA is dedication.

Chapter 12

Project Management – a Matter of Ethics and Robust Decisions

Lars Klüver

Introduction

It is in the project management that we find the 'flesh and blood' of pTA. When a project has been given the go-ahead, a project manager is put in charge, and what before could be seen abstractly as 'institutional settings' 'national culture' and 'innovation systems' suddenly becomes very real – it becomes an opportunity or an obstacle – and in the latter situation, something has to be done.

Project management has to work with problems at macro as well as micro level. The macro level can be thought of as the project manager's fight with 'the monsters' – the national culture, the employer institution, the project organisation, and the project's external world. The micro level is the manager's nursing of his/her surroundings – the handling of day-to-day problems, process emergencies, and the individual people in the project. Although in the analytical framework we have distinguished between these scales, from a project management perspective we will not make this distinction. Rather, the two scales are seen as they appear in the daily project manager life: hard to separate.

'Best practice' in TA is a concept that has to be seen from many sides. What is best depends upon the circumstances – the topic, expectations, resources etc. – and there is seldom only one good solution to a certain project management problem in TA. Many factors matter when a management problem has to be solved, and the evaluation of what matters the most will be crucial for taking the right decision. It follows that there are no such things as universal management solutions; that is, no universal methods, no advice that works in all situations. But the lack of universal answers is not the same as if there are no answers at all, and it certainly is not the same as saying that there are no such things as wrong decisions. This chapter aims to contribute to the understanding that there are indeed some decisions in project management that are better than other decisions.

It might be stated that the most important competence for project management is the ability to choose the most robust and efficient solution against the background of the often many-sided aims and considerations of the project, an overwhelming amount of influencing factors, a host of uncertainties and some universal claims for good participation practice.

Methodology in pTA is a rather new discipline, defined as 'the theory and practice of pTA methods'. The practice of these methods in many countries is less than five years old, and in few countries less than 15 years old. The theory is at an even more basic level, although developing fast these days. This leaves pTA management with a very thin support, and the challenges that management meets have to be handled very much intuitively or with experience as the most important reference. The intention of this text is to contribute to a broader set of references.

The aim of this chapter is to help clear the road for better practice in participatory technology assessment (pTA) in the future. The starting point for that expedition is not disheartening at all. Taking into account the relatively short history of pTA, our case studies leave the general impression that European practices in this field are, in general, of a high standard. Let this be stated here clearly, and let us then head for even better practices in the future.

Ethics of Project Management

Evaluating what is good/bad or right/wrong obviously has a problem of reference within it. In the context of pTA methodology, the principles of *discourse ethics* may serve as a frame for discussing best practice. Basically, if the deliberations in pTA do not live up to certain discourse ethical standards, the meaning of setting up participation vanishes, because:

1 deliberations must follow certain ethical rules in order to respect the participating individuals;
2 credibility of a debate is closely related to the ethical quality of the debate; and
3 the impact of TA is closely related to the credibility of the institution as well as the process (see Chapter 14).

What discourse ethics is can give rise to many and long debates. In order to give some impression of a possible standard, the following points can serve as a reference for the evaluation of project management in our cases.

Discourse ethical processes may be characterised by the following features[1]:

- striving for an equal empowerment of the participants (equality);

1 The list should be read as the author's own assemblage of discourse ethical criteria, often found in the discussion of the quality of debates.

- based on proper information (enlightened);
- fair with regard to interpersonal relations (fair);
- restrictions to the scope of viewpoints are kept to a minimum – the participants set the agenda themselves (open-minded);
- processes are self-documenting, and strive to be communicative, so that the need for interpretations are kept to a minimum (authentic);
- rules of communication (formal or informal) are known and accepted by participants (transparent);
- all affected parties are invited into the dialogue – none is left out on purpose (legitimacy).

In practice, of course, it is very difficult to set up processes fulfilling this standard. The difference in empowerment of the involved actors is a reality in our societies that cannot be taken away by setting up a pTA project. However, this must not be used as an excuse for not trying to optimise TA processes with regard to discourse ethics.

Discourse ethics have been put forward as a societal ideal, more or less as a synonym to democracy. 'Bottom-up policies' on empowering the powerless have often been unconnected from their outcomes, and seen as good in themselves. The 'master-free dialogue' in the Habermasian sense has the function of bringing in more and new rationales into the societal dialogue, because this would serve us with conclusions that come nearer to the truth. Although there are many good things to say about such ideals, it is important to stress that the inclusion of discourse ethics as a standard for project management of pTA does not necessarily take its starting point in a societal ideal. Rather, discourse ethics in project management finds its reason in a much more *instrumental* approach: pTA can make a difference if it can serve the technology debate with 'rooms of discourse' which have a high standard with respect to ethics, and accordingly gain high credibility and trust.

The instrumental role of discourse ethics in pTA covers the whole spectrum of purposes of TA. An open and fair discourse brings a *cognitive* value into TA due to the many-sided input and the deliberations of the participants. Most pTA processes make use of techniques that encourage the participants to search their own values and opinions in order to bring them into the debate – as a reality or a fact, which the other participants have to learn to know about and accept. The consensus conferences may be taken as one example.

There seems, however, to be a thin line between the cognitive and the *normative* input that the participatory processes deliver. The broader scope – or what could be called the personification of opinion – which is brought about by participation, on the one hand serves as a fact for the common process in the participatory exercise, and on the other hand, may serve as a highly normative input too. The mutual search for knowledge about each other's points of view brings, as an unavoidable companion, the knowledge about differences in values and interests. One of the specific qualities of pTA, as compared with more traditional analytical TA, may be the capability of

broadening the cognitive scope by mediation of knowledge and understanding of the norms and values in play. However, in order to get that far, the participants have to engage in and give trust to the process, and the features that make them engaged and trustful may well be the open-mindedness, authenticity and transparency of a well-designed pTA project. Many workshop methods do have these ethical qualities, for example.

The *pragmatic* purpose of pTA can hardly be brought about without discourse ethics being prominent characteristics of the process. The pragmatism is closely related to the negotiation, the mediation and the common ground found during the process. And the fact that the outcomes of process, in terms of new balances or common action, have to be realistic in the world outside the pTA process, calls for standards such as legitimacy and authenticity. Some pTA methods – for example the future search conference (Copenhagen Traffic DK), or the Swiss Dialogue (Gene Dialogue CH) – have their strength in the mediation of interests.

Discourse ethics can be implemented entirely because of the instrumental function they offer – and not because they represent an ideal. In practice, however, there seems to be a dualistic relation between the ideal and the instrumentalism of discourse ethics – they may be seen as an ideal because they supply the discourse with functionality (enriched debate; new rationales; high credibility; trust; democratic procedures) – and they may work, because they are ideal (something to strive for, live up to; widely accepted).

Discourse ethics are indeed connected to the concept of democracy and, as such, most people in democratic societies trust an organisation that explicitly tries to establish processes with high discourse ethical standards. The methods in themselves may contribute to a democratic development. But as seen from a project management point of view, it is just as important that the general trust the organising institution and the project gains increases the likelihood of the project to have an impact.

Political decision-makers, who often are the addressees of TA projects, are well trained in evaluating the credibility of political processes. Lack of transparency or legitimacy is immediately revealed by that target group, and consequently makes it difficult for a politician to trust that the results of a project have the needed validity.

Heading for Results

While claiming that the basic principle of the participatory element of pTA must be discourse ethics, it seems to be in utilitarianism that the overall purpose of TA can be found (Klüver, 1999). TA, in other words, is there in order to make a difference, to nourish change so that society can make the best out of the technology at hand, now or in the future.

That TA has to make a difference, calls for a targeted project management. In that sense, it can be argued that there might be a conflict between the need for a project that actually comes up with visible, acknowledged and

effective results, and a process that gives respect to discourse ethics. Participatory TA goes on in the real world, and therefore it has to adjust to the different demands, timing needs, changing conditions etc., imposed by the circumstances. It may be so, that it is not only the project management that has a need for such adjustment in order to be effective and make visible results out of the process. The participants may very well share that need, since they use time and resources, and since they have a motive for taking part in the pTA process. Accordingly, they might occasionally also give effect priority over ethics.

In contrast, it may as well be stated that discourse ethics and effectiveness do not at all have to be in conflict. A transparent process from the beginning, so that the participants know what they are engaged in, may be the starting point of a fruitful co-operation between a targeted project management and the participants. Participants who have worked together in a constructive and ethically reasonable process are likely to trust the management when the time comes for press releases and executive summaries. As seen from this point of view, one of the 'traps' in pTA lies in the wrong, but possible, belief that a targeted management has to have a hidden agenda.

The truth seems to be found somewhere in-between: in order that the project leaves traces, the project management has to be aware of the reasons for establishing the project (the problem analysis, see Chapter 13). She/he has to work strategically with regard to project set-up, composition and roles of participants, communication to the press and the target groups etc., in order to reach the kind of results the project set out to achieve. However, part of the strategy should be to respect the discourse ethical standards as far as possible, in order to gain the advantages – for the participants, for the surrounding society and for the arranger – that a proper and trustworthy process delivers.

A Proposed Model for the Problem of pTA Project Management

Management of TA projects is about finding solutions to any challenge that stems from the given circumstances. We have sketched these circumstances in the theoretical and analytical framework.

The management challenges may be of two kinds – setting up the right project (project set-up), and dealing with people and changes along the project time line (project management). The two kinds of challenges obviously are very interdependent. Setting up a proper project can proactively deal with many of the problems that otherwise would have appeared later on, and the case studies certainly show that many problems can be avoided by picking the right method. On the other hand, if the way the project has been set up makes the boundaries too narrow for the process, proper project management should work flexibly and pragmatically, and change the set-up as needed.

The following will mainly treat the project management perspective, but it is necessary to keep in mind the opportunities or restrictions the project set-up contributes, as regards the degree of freedom left for the project

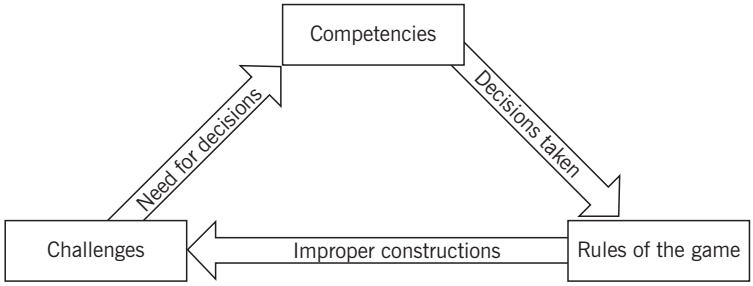

Figure 12.1 *Model for the Problem of Project Management*

management. It is also relevant to look at the problems imposed on management by improper set-ups.

The model in Figure 12.1 gives an impression of the problem of project management. There are different challenges that call for decisions to be taken. In order to take these decisions, some competencies have to be present and active with or near to the project management. When decisions are taken, they alter the rules of the game in some way or another. This again might give rise to new challenges, if the necessary decisions do not fit the project construction (formal or informal agreements; expectations; interests of the involved parties). In the following, the elements of this model are discussed.

Management Challenges

Management challenges in this model should be interpreted as any circumstance that makes it necessary for a project manager to react. The reason for intervention might be to ensure that the process strives for proper discourse ethics or to ensure impact of the project.

The challenges might be split into three different kinds:

1 project set-up;
2 dealing with people;
3 dealing with changes.

There are multiple challenges of these kinds, many of them uncovered by the cases. In the following, several of the challenges listed below are discussed to give an idea of the broad scope of possible challenges:

1 Project set-up:
   - lack of proper methods;
   - lack of resources;
   - biases in the project organisation;
   - too narrow an expert definition;
   - collaboration problems between organising institutions;

- framing of the debate by organiser;
- lack of communication strategy;
- the not-invented-here syndrome;
- lack of experience.

2 Dealing with people:
- bad group dynamics, or disturbing people among participants;
- actor groups difficult to collaborate with;
- handling of the media;
- participants demand changes in procedures.

3 Dealing with changes:
- outside pressure groups trying to intervene in the process;
- stakeholders criticising the method/management;
- time pressure.

In the following pages, most of these challenges will be discussed.

Lack of Proper Methods

PTA is a rather new function in the societal debate on technology. Methodologically it has developed to a point at which many countries are experimenting with very few methods, and only few countries have what could reasonably be called an actual pTA methodology – mainly the Netherlands and Denmark. There are many reasons for this, but it is a fact that, in many of the cases, the methods are brought in or developed. Even in those countries that have the most experience with pTA, and the best equipped toolbox, new methods and procedures are implemented now and then, in order to be able to treat certain problem situations (this touches on the issues discussed in Chapters 11 and 13).

If we focus on searching for methods that fit a certain problem situation (problem-driven motive), and for the moment ignore the fact that an important objective may be in itself to try out a method (method/introduction-driven motive), it seems that the arrangers of the cases have a huge innovative power. Many of the cases are using new methods explicitly to deal with a particular problem situation (Delphi AU; Traffic Forum AU; Copenhagen Traffic DK; Drinking Water DK; Urban Ecology DK; Gideon NL; Gene Dialogue CH).

An interesting question, which actually cannot be answered, is whether the arrangers in these cases did in fact find and use the best-choice method? The reason why this question cannot be answered is that a comprehensive and coherent system of criteria for the choice of method has not been developed yet. The choice of methods in pTA in other words very much depends upon experience, intuition, local rules-of-thumb, and a growing, though still small, set of criteria among the most highly trained institutions.

The choice of method is a challenge to pTA management; besides the lack of a coherent set of criteria and a corresponding set of methods, there are very few different, well-described participatory methods available.

Biases in the Project Organisation

In only a very few countries did we find institutions, aiming to perform pTA, that are independent in the sense that they are institutionally self-governing and are largely free from outside political influence. Consequently, most pTA processes are set up as initiatives from enthusiastic individuals, from parties that cannot be said to be independent, or from institutions that usually use a different type of culture or methodology. It is important to note that, if these persons or institutions did not set up pTA processes, it is likely that the processes would not be set up at all. In certain respects, possible bias can be seen as an unavoidable side effect of the very admirable act of establishing a pTA culture.

From our cases it must be concluded that bias is not a general phenomenon. On the contrary, most cases can be seen as providing rather exemplary independent work. But even in these cases, it is possible that bias was present, but has been handled well – maybe by setting up proper project steering, by making the processes transparent, or by other means that either outbalance the bias or make it difficult for bias to occur.

The challenge to management is to sensibly work with the 'system errors', try to be open about them and compensate for them in a way the participants would be happy with. Otherwise, there is an increased possibility that the participants will uncover the bias and react towards it. Two of the cases below (Plant Biotech UK; Citizen GMO UK), in which signs of bias can be found, mostly reflect situations in which the managers were not aware of the importance of managing bias. One case (Biotech Baden-W. GE) is an example of a project that was set up with intentions that were strongly biased.

Case study findings:

- Biotech Baden-W. GE. The project was initiated as a consequence of the worries of politicians and industry that German regulation would make biotech industries leave Germany. The motive was a desire for technology push and deregulation from one interested group. Project management was biased towards promoting biotech, and conceived the participatory process as a tool provider. No experts critical to genetic engineering were invited to the expert panel. Environmental issues were not investigated – albeit a broad range of other societal issues were.
- Plant Biotech UK. Set-up and management did not fully compensate for the possible bias and focus of the arrangers (a positive attitude to biotech; a public understanding of science approach to the lay people). The public understanding of science (PUS) approach of the arrangers resulted in many smaller changes of the method concept, that all together became profound. Examples: lots of expert presentations and teaching at the first preparatory weekend (7 experts, compared with 1–2 in the usual method); more experts at second preparatory weekend (12 experts, compared with 0–1 in usual method); a highly pressed expert presentation programme at the conference (21 experts, compared with 12–16 in the usual model).

NGOs criticised the process for being framed and biased. This happened before the lay panel had presented their final document, and seems to have contributed to the cautiousness of the panel.

- Citizen GMO UK. The project manager was initially a member of the management board of the NGO which funded the project. He left the board in order to separate interests. But the distinction between the interest group that initiated the project (the NGO) and the project management was not really clear. Several stakeholders did not want to take part in the stakeholder panel, some with reference to the organisational set-up. The press event at the end of the project showed that the link to the NGO in effect was strong.

Too Narrow an Expert Definition

The assumption that experts are objective and free from interested parties is generally undermined by the idea of technology assessment, since TA works on the premise that technology is a social construction, and that experts take part in the networks constructing it. Besides, many conflicts about uncertainty in the modern society may be traced back to the expert as 'part of the problem', because uncertainties are made by technological innovations without science being able to come up with answers (see Part II).

However, this interpretation of the role of the expert is not distributed among all parts of society, and there is still a widespread belief that experts can be trusted to be unbiased and as non-stakeholders. Therefore, participants can be frustrated when experts' bias becomes apparent.

In participatory processes it is important to address clearly this problem, and work with balances of experts, such as would normally be used to balance stakeholders.

The understanding of experts as the sole carriers of rational knowledge and facts is fundamentally problematic in pTA. Other participants bring knowledge into pTA processes, and it might be valuable, though not scientific. PTA processes are often, as part of the cognitive purpose, intended to provide room for knowledge that is often neglected by science (experience, tacit knowledge, knowledge about one's own life and situation, sensitivity to developments and situations here-and-now) due to its different – apparently non-scientific – rationality. Because of that, pTA often includes participants with these kinds of knowledge, either as part of the assessors in the method, or as witnesses/experts.

Case study findings:

- Drinking Water DK. Expert participants were selected, so that a balance was made between experts from stakeholder groups, and experts from public research institutions. Politician participants were mixed as regards to decision-maker level and geography. Citizen participants were randomly selected.

- Biotech Baden-W. GE. The method, which was developed by the arranging institution, gives certain roles to certain actors: experts are always establishing facts; interest parties assessing feasibility; and citizens assessing desirability.
- Biotech Baden-W. GE. No experts critical to genetic engineering were invited to the expert panel. Environmental issues were not investigated, though a broad range of other societal issues were. The non-experts (lay participants) seem to have been aware of possible bias among the experts, since they preferred authentic presentations from experts/stakeholders representing their own standpoint, instead of expert lectures about the pro and con standpoints.
- GM Animals NL. Expert presentations were considered by the lay panel to be biased.

Collaboration between Organising Institutions

Often – and there is a handful of examples among the EUROPTA cases – pTA projects are established by more than one institution. The reasons for this can be manifold. First, many pTA projects are initiated by *ad hoc* organisations that have to gain a certain organisational legitimacy (Plant Biotech UK; Citizen GMO UK; Gene Dialogue CH). Second, competencies in management may be gathered by joint projects (GM Animals NL). Third, it often serves as a good background for external funding in which more than one institution is engaged in a project (Novel Food NL was established as a co-operation project, and was financed by a research programme). And fourth – although we do not find examples among our cases – the often cross-sectoral and cross-discipline approach of pTA makes it opportune to seek co-operation with other institutions (councils, governmental offices, universities etc.) on the project.

Project management has to deal with the different organisational cultures and different levels of pTA experience in such co-operation projects. This sometimes means acting as a strong advocate for a strict and consequent methodology that respects the ethics needed for a participatory process. This also means avoiding compromises that may have an organisational logic behind them, but may also have a profound reduction of credibility as a result.

A special kind of co-operation is the use of an external consulting firm as operator on the project (Gene Dialogue CH). Such companies may be extremely qualified methodologically and as such the management should be in good hands. Nevertheless, there are preconditions that have to be fulfilled before such a co-operation should be established. For example, it should be ensured that it is the *competent* consultants that are doing the management, since the distribution of work inside the consultancy firm is usually out of the hands of the client. Another precondition is to ensure that the consultancy firm does not have major clients (such as multinationals), which would make it difficult for the firm to act independently.

On the one hand, consultants may take away project responsibility from an initiator of the project, who may be suspected of imposing a bias on the project, but on the other hand, it comprises a paradoxical risk in that the hired consultant might then try to live up to the supposed expectations of the initiator, and thus take over the bias. This hypothetical problem is only presented in order to picture the complexity of co-operation on TA.

The Pros and Cons of Framing the Discourse

Framing may be defined as an action that sets the scope of the process, through definition of issues, roles or rules, so that, for example, the open-mindedness or legitimacy of the process is delimited.

A topic that is going to be treated in a pTA project is most often defined in a political process, in which interests, values, ideals, political strategies and power relations play a role (see Chapter 13). To the extent that the definition of the project is deliberately made in order to gain a certain outcome, one may speak of biased framing of the participatory discourse. Framing can, however, be made with the purpose of targeting the issue in order to make the project live up to its role, and in that situation we can speak of strategic framing. Obviously, there is a thin line between these two ways of framing the deliberations in a participatory process.

The cases show examples of both biased framing (Biotech Baden-W. GE; Plant Biotech UK) and strategic framing (Drinking Water DK; Biotech Baden-W. GE; Gideon NL; Novel Food NL).

Both kinds of framing are in opposition to the discourse ethical claims for fairness, equality, open-mindedness and transparency of the process, and consequently, framing might strike back as a general mistrust inside the project or to the project process or outcomes. If the organiser is aware of the possibility of the framing and the risk for counter-productiveness it represents, it is possible to establish an acceptable level of independence on a project basis, in order to compensate for the potential risk (Citizen GMO UK).

Strategic framing, on the other hand, may be well reasoned, and the risk of mistrust may be calculated and found to be reasonable, compared with other risks in the project. If the organiser spots a need for an assessment that is narrowly scoped, it is reasonable to restrict the process to certain aspects or to a certain approach to the problem (Delphi AU; Drinking Water DK; Novel Food NL), but for obvious discourse ethical reasons it is crucial to be open about such decisions and the rationales behind them, and to be ready to change the conditions if necessary.

One example of such reasoning behind strategic framing is the necessity to consider that, if the scope of the project is very broad and loosely defined, there is a risk that the outcomes become too general to be useful for policy-making. If the project is established in order to serve politics or other 'customers' with assessments and options, the method as well as the framing of

the problem have to be suited for that purpose (Copenhagen Traffic DK), which may mean that the issue has to be precisely defined, leaving less opportunity for the participants themselves to find out what scope they consider relevant.

Case study findings:

- Delphi AU: project was a pilot exercise. This was not understood/accepted by some people outside, who afterwards criticised the limited scope of the project.
- Copenhagen Traffic DK: very openly defined topic. Left to the participants to define the scope of the topic.
- Drinking Water DK: project focused on surface pollution from agriculture. The agriculture stakeholders found that this was too narrow a scope, and they put it forward that industry and household contributions to water pollution should have been included.
- Biotech Baden-W. GE: the motive was a desire for technology push and deregulation from one interest group. Project management biased towards promoting biotech, and conceived the participatory process as a tool for that. No experts critical to genetic engineering were invited to the expert panel. Environmental issues were not investigated.
- Citizen GMO UK: project initiated by an NGO, who needed a specific GMO food perspective. The project manager insisted on giving the lay panel a more open starting point – future of food production and agriculture. The project management did not tell the citizen panel that the main interest of the organiser, and much of the stakeholder panel, was about GMO foods. Outcome seems to have a broad scope, and as such it is doubtful whether the initiators got the kind of answers they expected.
- Gideon NL: method focuses on one stakeholder view (agriculture) on the topic. An 'ecological crop protection' scenario was not considered viable and realistic by the stakeholder representatives.
- Novel Food NL: the aim of the project was to convince actors about novel proteins as substitutes for animal proteins, in order to gain sustainability. The aim was not an assessment of that vision. Back-casting processes were framing the scope of the project, since not only a future vision of a certain societal situation was envisioned, but a concrete technical solution too. The participants were not allowed to bring their own visions to the fore – and other technical or non-technical solutions to sustainable food were not made possible in the vision. Situations occurred where participants were annoyed by this framing, but the process manager closed these debates, reminding everyone that definitions and problem choices were not open for discussion.

Modification of Methods

Changes to methods are often seen when a method is used for the first time by an organiser (Ozone AU; Plant Biotech UK; GM Animals NL; Gene

Dialogue CH). There might be good reasons for this, if it is concerned with necessary adaptation to, for example, national or institutional culture (see Chapter 11). But, on the other hand, there is a danger (which cannot be documented by the cases), that such changes are made because of a lack of humility towards the original procedures (such a reaction has sarcastically been called the not-invented-here syndrome), and a danger that important qualities are lost or new problems born in the process.

Some of the cases can be taken as examples of problems arising from changes in methods (Ozone AU; Plant Biotech UK). Experienced pTA organisers, for example the Danish Board of Technology, have made many variations on well-known methods, and it is a general experience from such experiments that they are not at all always fruitful.

There are examples of cases in which the organisers have chosen to use a new method stringently in its original format (Copenhagen Traffic DK; Electricity CH), although the introduction of the methods did provoke debate about, for example, national culture differences from the nation in which the method originated. In both cases, it appears that the methods worked well, despite their foreign origin.

It seems pertinent to conclude that a cautious and step-by-step approach should be taken when changing well-described and well-tested methods.

Case study findings:

- Ozone AU: citizen panel consisted of young people only – 16- to 28-year-olds. This deviation from the method ended up being counterproductive because of bad group dynamics among the young panel and the resulting lack of ability to produce politically relevant conclusions.
- Plant Biotech UK: the public understanding of science (PUS) approach of the arrangers resulted in many smaller changes of the method concept that, all together, became profound. Examples: many expert presentations and substantial teaching at first preparatory weekend; more experts at second preparatory weekend; a highly pressed expert presentation programme at the conference. The changes ultimately gave too little time to discourse processes: 1) lay panel definition of questions, 2) lay panel choice of experts, 3) dialogue at the conference. Both lay people and experts regretted this.

Lack of Communication Strategy

Most pTA methods offer a procedure that makes it possible to reach certain goals together with the participants. However, only very few methods in themselves offer the communicative mechanisms that are necessary to make the messages reach the target groups. Consequently, it must be seen as the responsibility of the project management to design and realise a communication strategy of the project.

There are a number of different approaches that can be taken with respect to communicating effectively the aims and results of a project. The list below

is not intended to be complete, and it covers some techniques that are not necessarily mutually exclusive, and might be used in combination:

- *Making agreements with the target group beforehand* about the dissemination and use of the project results. The target group and the arranger may have a common interest in ensuring that the target group is well informed about the progress and results of a project[2].
- *Including the target group in the process* in order to inform them about the outcome, but even more importantly to make them share responsibility for the outcome[3].
- *Inviting target groups to give ideas to and refine the outcomes* of the project. When a TA project starts up, it is often possible and relevant to make a meeting at which stakeholders and other target groups are allowed to come up with ideas for problems to work with or questions to answer in the project. Similarly, when the project nears completion, the target groups may be invited to comment on a draft report in order to correct factual errors or to come up with suggestions for conclusions and recommendations. Such consultation of the target groups may in itself serve as a participatory process (Delphi AU; Gideon NL; Gene Dialogue CH).
- *Internet debate* in parallel with project activities. The Internet makes it possible to establish debates, discussion clubs and chat-rooms that may serve as side projects to the participatory process. Management may feed in input to the discussions in the form of papers or background materials that have been used by the participants. This provides possible contacts and services for a much wider target group, increasing the interest and readiness for the coming results of the project[4].
- *Networking or using personal contacts to communicate the result to the key players*. Besides the more open and public communication channels, personal contacts may play an important role in communication of the outcomes of a project (Copenhagen Traffic DK; Gene Dialogue CH).
- *Information meetings with key players* may be possible to establish. Often it is an opportunity for parliamentary TA offices to arrange such meetings for the parliamentary committees of relevance. Meetings with other target groups (leaders of workers unions and trade unions, industrialists, scientific societies etc.) most often are an option (Citizen GMO UK).
- *Dissemination through established adult education institutions* etc. Most countries have networks or programmes of adult education, be it

2 Ozone AU may serve as an example, since there were politicians who had shown interest beforehand. However, the results did not turn out to be of a kind suitable for direct use by the politicians.
3 Urban Ecology DK included politicians, civil servants, industry and local citizen entrepreneurs in making local action plans on urban ecology.
4 The cases do not comprise examples of Internet support activities, though such information and deliberation measures are known to be used by TA organisations. The Danish Board of Technology has held electronic Internet conferences in connection with several projects, and the UK Advisory Committee on Genetic Testing linked one of its activities to Internet deliberations (Finney, 1999).

connected to religious communities, workers unions, political parties, or independent institutions. Often such institutions lack written texts to use as a background for debate. Booklets, easy-read pamphlets and such relatively cheaply produced materials may be distributed in hard copy or through the Internet to such networks (Drinking Water DK).

- *Press activities*. Various activities may be directly aimed at the press: press events before, during and after the pTA process; press releases; interviews with participants etc. The press is an important message carrier to political target groups, since the latter always read newspapers[5].

There are many more possible actions that may be taken as part of a communication strategy. Implementing such actions into the project from the beginning – that is, at the set-up of the project – increases the chances of proper communication. Inventing initiatives along the project line may turn out to give creative results, but the risk of taking an initiative too late is great.

It is essential that the project is an open and available activity for the target groups until the report is released. Many a fine, efficient and well-managed TA project has lived a very quiet life – even after completion – because of the lack of focus on communication as part of the activity.

Lack of Experience

Among the 16 case studies in the EUROPTA project, the level of experience is as follows:

- Fourteen examples of the use of methods that are new to the organiser[6]. New in this respect means that the method has been used for the first time, or has been developed by the organiser.
- Out of these 14 cases, 8 were performed by arrangers with no or little experience in pTA[7]. The rest were performed by arrangers with profound experience in other participatory or deliberative processes.
- Out of the 8 cases of new methods used by inexperienced organisers, 4 had experts in methodology connected to the project[8], and 3 had an evaluation of the project made[9] (these figures may be misleading, since we have not specifically asked about evaluation procedures in the research protocol).

5 Drinking Water DK; Plant Biotech UK; GM Animals NL; Electricity CH are examples of cases that include active press strategies before, during and after the pTA process.
6 Delphi AU; Ozone AU; Traffic Forum AU; Copenhagen Traffic DK; Drinking Water DK; Urban Ecology DK; Discourse GMP GE; Plant Biotech UK; Citizen GMO UK; GM Animals NL; Gideon NL; Novel Food NL; Electricity CH; Gene Dialogue CH.
7 Delphi AU; Ozone AU; Traffic Forum AU; Discourse GMP GE; Plant Biotech UK; Citizen GMO UK; Electricity CH; Gene Dialogue CH.
8 Plant Biotech UK; Citizen GMO UK; Electricity CH; Gene Dialogue CH.
9 Delphi AU; Plant Biotech UK; Electricity CH.

- One EUROPTA case has a medium status with regard to experience, since the project was performed in an organisation that has developed the method, but was carried out by another department with inexperienced project managers[10].
- Only in one case is there an example of a method that has been used repeatedly by the organiser[11].

This marked lack of experience is not usual for pTA. Rather, it stems from the fact that the cases come from all EUROPTA partner nations, of which some have only little experience with pTA. Further, it stems from the selection of cases, as for example the Rathenau Institute and the Danish Board of Technology chose to analyse cases about introduction of new methods. (For a further discussion of the use of new methods, see Chapter 11.)

PTA is spreading, which means that there will be many more projects in the future that are managed by inexperienced institutions or staffers. This is not necessarily a problem in itself, since everything has to start at some point, but it will have implications for the ambitions and expectations connected to the projects. An inexperienced team must not be expected to be as targeted, efficient and instrumental in its use of pTA methods as more trained teams. Accordingly, they should not be expected to contribute with the same level of fulfilment of project goals, as the experienced teams.

As participatory processes will be judged by the participants from their individual viewpoints (stakeholders, citizens, experts, politicians), it is very difficult for the project management to get a picture of the judgement without an evaluation. The evaluation might be project-specific in the sense that the participants and the affected stakeholders are asked for their evaluation, or it might be in the form of a more broad audit of the effect of the project on the debate (records of parliamentary debates, newspaper coverage, citations etc.)

One case on first-time use of the consensus conference method in country (Electricity CH) reports on the very important positive effect of consulting experienced pTA experts when setting up a project, and of setting up an evaluation. The information helped to trim the procedure, to cope with management problems, to discuss the method with outsiders, and to evaluate the feasibility of using pTA methods in the future.

There are examples of evaluations that have been of great importance for the further debate or use of pTA in the country (Plant Biotech UK; Electricity CH). The Swiss example shows that an in-depth evaluation may serve as a reference for the discussion with external observers (scientists, politicians etc.) – a discussion that may help to clear the road for later initiatives.

Besides these national effects of evaluations, there is an international effect that should not be neglected. Evaluations make up an important basis for methodological discussions and the diffusion of methods in TA, and ultimately such debates make up a forum for the refinement of pTA management.

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10 Biotech Baden-W. GE.
11 Sustainable Menu NL.

Bad Group Dynamics, or Disturbing People among Participants

Dealing with people is an important part of pTA project management. In essence, it is what participation means, so the people involved in management have to be aware of and able to handle situations when inter-personal relationships become problematic. As our case studies show, the managerial handling of such situations may make the difference between success and failure of the participatory process. On the one hand, differences in opinions, values and attitudes are the energies that make the participatory project run. On the other, it may be the energy that makes it explode.

Among our cases we find one project (Ozone AU) in which a change was made in the consensus conference method, so that the lay panel was made up of young people only. The group had bad group dynamics internally and was rather sceptical to the facilitation. During the process they wanted to work without facilitation, but they were not able to manage the facilitation themselves. This resulted in a final document that did not live up to the expectations, and accordingly did not have any impact, although politicians *were* ready to listen to the panel.

Another case (Electricity CH) had problems with one participant who was disruptive for the other panellists, and was very resource-demanding for the project staff. The staff decided to serve the panellist as he wanted, and left it up to the facilitator and the rest of the panel to deal with the problems as they arrived. As the person was perceived to be annoying by the rest of the panellists, even better group dynamics were developed through the process, as the panellists to a certain extent had a common 'enemy', and minor conflicts in the group were easily handled. According to the arrangers the problem ended up being positive for the whole process.

In general, the handling of inter-personal problems has to balance between respecting the individual person – even if he/she acts in a problematic way – and the needs of the majority. This may be done by using the management's right to set certain rules (for example to impose facilitation upon the group) or, quite opposite, to prevent setting specific rules by pushing the participants to take action themselves. Both sides of the balance may be seen as actions that respect the discourse ethical claims for the process, as long as they are exerted with openness and transparency.

Case study findings:

- Delphi AU: one participant made trouble, not accepting the given procedures. He was alone with his standpoint, but used one of the moderators' resources disproportionally.
- Ozone AU: citizen panel consisted of young people only – 16- to 28-year-olds. Deviation from the method ended up being counterproductive because of bad group dynamics in the young panel. The panel was very sensitive to influence from the arrangers, and eventually did not want the help of a facilitator. The arrangers respected that decision.

- Electricity CH: one lay panellist was problematic, not accepting procedures and outcomes and taking away resources from management. At first it caused problematic situations among the lay people, but after a while it actually strengthened the group dynamics among the other panellists.

Actor Groups Difficult to Collaborate with

Many pTA projects run into problems of gaining access to or involving some very important actors. Politicians can often be difficult to engage in the process, but other busy people – industry leaders, top level civil servants – may also be difficult to engage.

Some methods are very vulnerable to cancellations from the participants. It seems to be a challenge for the development of methods in pTA to come up with methods that serve these important actors by giving them an opportunity to participate, without making the method dependent on them. Ultimately, the problem cannot be fully solved – only partly compensated for, for example, by ensuring participation from the decision-maker's staff, or by making use of other communication means to reach these people.

A solution for some arrangers – the parliamentary TA institutions – may be to make use of methods particularly focusing on the needs of decision-makers, and adapted to fit into their busy lives. Such methods may be different kinds of public or parliamentary hearings on the premises of the MPs.

Case study findings:

- Copenhagen Traffic DK: the acceptance of the project and method by the planning group is a very vulnerable part of the method. If they accept, the project is safe from that point on, but if they reject, the project is impossible to carry out, and might as well be closed down. The planning group supported the process, all actor groups participated, but the politicians were only present during parts of the process.
- Urban Ecology DK: difficult to make the politicians take part in the scenario workshop process – Danish politicians are familiar with different local debates, and may be a little over-fed with deliberative processes? The method has been used in the EU as a follow-up project, and in other European countries there was a greater interest among politicians to take part.
- Sustainable Menu NL: a key actor in the debate (one of two politicians at the centre of the debate) cancelled his attendance the day before the debate. A replacement politician had to be found very quickly, possibly giving rise to non-optimal preparations.
- Gene Dialogue CH: Some NGOs did not want to participate because of scepticism of the intentions behind the project.

Stakeholders Criticise the Method/Management

PTA processes mostly deal with highly political issues, and consequently it is likely that stakeholders who do not agree with the outcome of a pTA exercise will criticise the project (see Chapter 14). However, the more obvious it is that the process has been set up with respect to certain discourse ethical criteria (enlightenment, transparency, authenticity, legitimacy), the more difficult it is to criticise the project.

It may be enlightening to test the information input to the process with the stakeholders. For example, a preparatory group put together to balance interests might be set up in order to prepare or approve the information material that is fed into the process. Transparency may be ensured by such a preparatory group, or by other audit procedures. Authenticity can be accommodated by making the participants produce their own documentation, and by avoiding steps in the procedure that involves 'messengers' translating or interpreting the outcome of the process; in other words, by letting the participants speak for themselves. In some situations, the authenticity of the procedure may be verified by testing the results. It may be done by repeating the process or – when representativity of the participants is crucial – making a survey of a representative part of the population.

The legitimacy of the process is increased when the composition of the group of participants is relevant. This might be achieved through planning and selection of participants together with, or under audit of, the stakeholders.

Obviously, it is of crucial importance to avoid specific and relevant critique of the project, and it is therefore important to manage the set-up of the project (especially the project organisation) in order to compensate for possible weak points in the procedure.

Our case studies show some examples of external critique, but, taking into account that most cases touch on sensible matters, it seems that the cases show a general trust and acceptance of the methods, or, at least, that the answers to the critique have turned out to be satisfactory.

Case study findings:

- Drinking Water DK: at the voting conference, the participants (composed of equal numbers of politicians, experts and citizens) vote on suggested action plans. The 'losers' afterwards criticised this element as populistic. After the conference, the agriculture stakeholders claimed that the citizen group had not been representative. Consequently, the arranger launched a public survey with 1,000 respondents, asking the same questions that were asked at the conference. The poll showed exactly the same result as the conference.
- Biotech Baden-W. GE: project established with a bias towards pro-biotech. The Ministry of Environmental Protection criticised the lack of environmental assessment, because it would have been an important input to the social discussions in the participatory phase. The Conservation League criticised the project for not being a critical assessment, but a 'maximisation of economic gains'.

- Plant Biotech UK: NGOs criticised the process for being framed and biased. This happened before the lay panel had presented their final document, and seems to have contributed to the cautiousness of the panel. For example, the panel excluded the project management and the facilitator from their deliberations in order to avoid external critique.

Competency

The term 'competency' has two connotations, both relevant in project management: the meaning of ability – the skills and knowledge necessary to do a competent job, and the meaning of empowerment – the authority to take decisions.

When decisions are to be made, the access to competent decision-makers is crucial. Competency is a resource, if it is there when you need it. However, not having access to the needed competencies, or even dealing with the problem of having to work with people who do not have the necessary competencies, is often the reality of project management.

Project management relies on a multitude of competencies, distributed among many people or actors. Most projects (cases) hold a rather complicated project organisation, in which many groups exert influence on parts or phases of the project. In order to embrace some of the aspects of competencies in project management, some comments on the various management actors will be given.

The Host Institution/Organiser

As described in the analytical framework, the institutional context of a pTA has a profound impact on the set-up and running of a project. The decision-makers of the organiser (board, chairman, director, senior staff, project manager) do not always have the necessary methodological skills to make the right decisions – but they may not be aware of this, and may have to make decisions anyway.

The remedy to this kind of problem may be to forward methodology as an important factor for the success of the institution. This can be done by arranging methodology seminars, publishing notes/books on methodology, or maybe even by stating methodological competency as one of the goals of the organisation. The expected internal effect of such a strategy may be a greater respect towards those possessing the needed competencies, and accordingly a more attentive approach to the advice given by project management. (See 'Lack of experience' on page 193 for further discussion of institutional competencies.)

The Steering Group (or Planning Group; Reference Group; Support Group etc.)

The project organisation (project-internal decision-making structure) is often constructed with great respect for the professional knowledge about, or interests in, the issue at stake. More seldom, methodological expertise is included, despite the fact that many methodological decisions are often taken by, or in dialogue with, the steering group(s).

External methodological expertise is most often needed at first-time use of a method, and mainly when the arranging institution does not have a tradition for pTA (Plant Biotech UK; Citizen GMO UK; Electricity CH; may serve as examples of the first-time use of external expertise). But there are examples of experienced institutions that had a need for development of new methods, and accordingly established co-operation with other methodological experts (Urban Ecology DK, among others).

An important role for the steering group is to function as a watchdog regarding the ethical quality of the management. This includes keeping an eye on the fairness of the process, ensuring legitimacy of the participant group as well as of the inputs given to the participant, and claiming and supporting transparency of the process. In order to act as a watchdog, the group has to be able to take a stand regarding the process – whether or not this means criticising the process or protecting it from critique.

Project Manager (or TA Researcher)

TA – and maybe especially pTA – demands a skilled and experienced project manager, or as compensation for the lack of skills, an experienced advisor. Because of the process-oriented projects in pTA, there are many kinds of traps into which one can run. This chapter sketches a series of traps and problems of this kind. Awareness of the 'warning signals' does not come by itself – it is a competency that has to be developed through training. A general impression from our case studies is that the well-settled, pTA-experienced institutions (Copenhagen Traffic DK; Drinking Water DK; Urban Ecology DK; GM Animals NL; Gideon NL) run into less problems than *ad hoc* projects at less experienced institutions (Ozone AU; Plant Biotech UK; Novel Food NL), although there are exceptions to this rule (Citizen GMO UK; Gene Dialogue CH).

Build-up of methodology competencies within TA staffs takes time, and one of the most important factors to ensure such competency is continuity among staff members. It takes a permanent staff at a permanent institution to be able to guaranty capable managers, and of course it takes a rather consistent policy on the use of pTA methods.

From the experience of the established institutions in this field, the following qualities may be suggested as something to look for when employing pTA project managers:

- a democratic attitude to processes;
- respect for other people, whatever their formal status;
- a sensitivity to political topics;
- process- as well as result-oriented policies;
- fast move from thought to action;
- ability to place process outcomes over one's own ambitions regarding influence;
- innovation.

Facilitator/Mediator

In many pTA methods, a central role is given to the facilitator. It follows, then, that the difference between success and failure is often put in the hands of this person. The cases tell stories of both successes (Copenhagen Traffic DK; GM Animals NL; Electricity CH) and less fortunate outcomes (Ozone AU; Plant Biotech UK), at least partly due to the qualities of the facilitator.

The solution to problematic facilitation might be to intervene and support the participants by withdrawing the facilitator from his/her role (Ozone AU shows an example of such intervention, but the arrangers did not apply another solution to the need for facilitation; Plant Biotech UK is an example of the participants taking over facilitation themselves and doing it well).

A specific problem with facilitation is how to instruct a facilitator to play the necessary role. Attempts have been made to make a manual on the expected 'style' of facilitation (at an Australian consensus conference not described in the EUROPTA cases[12]), with positive outcome. The Danish Board of Technology has had a positive effect from very thorough briefing of the facilitator before and during his/her first assignment to a method. But despite these positive results from briefing, facilitation is very dependent on the personal qualities of the person in question, and the selection of their person plays a major role in gaining successful facilitation.

Qualities that may make up a good facilitator can be:

- pedagogic competencies;
- democratic attitudes;
- consciousness about discourse ethics;
- psychological sense;
- consciousness about group dynamics;
- result-oriented.

12 Personal communication with social scientist Alison Mohr at the second EUROPTA workshop.

Rules of the Game

All projects have their rules. They may be formalised and transparent, or they may be informal and unspoken, to the extent that a method may be defined as a set of rules of action and interaction. It follows, that any decision made in a project in effect is a change of the rules, and as such changes the conditions of participation. These changes might not be welcomed by the participants, which will culminate in new conflicts demanding new decisions.

The rules of a project can be classified as:

- Rules that cannot be subject to negotiation. For example, the rule that the lay panel in a consensus conference defines the questions that will be answered at the conference and answered by the panel itself in the final document (Electricity CH and others). If this rule was subject to negotiation, so that, for example, the experts defined the questions, the consensus conference would lose its open-mindedness and authenticity – very important ethical characteristics of that method.
- Rules that are set, but may be negotiated. An example is the internal procedure of the consensus conference lay panel when they write the final document. The facilitator should suggest a solution, but should be open to changes if the lay panel desires.
- Rules that are defined by the participatory process. An example is the rules that are concerned with structuring of content of the deliberation, done by the participants – as happens during different workshop sessions.

The involved organisers in our case studies have different approaches to how they define a project, and this may influence the way in which rules are made, and subsequently the way in which they are perceived by the participants. A more open definition of a project (Gideon NL; Genetic Dialogue CH may serve as examples) in which the project – and following the rules – is defined along the project line, leaves a lot of decisions with the project management, and subsequently the credibility of the process is a matter of trust to the manager. In contrast, with a more strict and detailed project definition (Copenhagen Traffic DK) many decisions about rules are taken in the initial phases during project establishment, and the manager from then on follows up on the scheduled plan. This frees the project manager from the personal responsibility of inventing the right processes as they proceed, and this again leaves the credibility coupled to the method used.

Rules Not Efficiently Communicated

It follows from the discourse ethics (transparency, equality, fairness) that as far as the rules of a project/method can be described in the terms above, the project management has an obligation to do so and communicate this to the participants. The degree of freedom for the participants to define or change the rules must be clear to everyone inside the process – and often outside too.

In general, the case studies leave the impression that the arrangers of pTA projects are aware of the degree of flexibility that can be imposed on the rules of a method. However, there seem to be examples of procedural problems in the cases that may be interpreted as a failure in proper communication of the status of given rules.

Case study findings:

- Ozone AU: policy options were not communicated efficiently to the panel by the experts, because they thought it was not acceptable for experts to come up with options. Consequently, the citizen panel misinterpreted this as an unwillingness to forward such options. The organisers knew that politicians were ready to take the consequences of the results of the conference – the impact was almost guaranteed in advance. However, the citizen panel was not suitably informed, because the organisers were afraid that the panel would make changes to the recommendations if members knew about the political interest.
- Plant Biotech UK: lay panel members thought that their consensus had to be in balance with what they believed the general citizen/consumer would think. An expert thought that the conference had the purpose of informing the audience – because he had already met the lay panel at the preparatory weekend.
- Novel Food NL: back-casting processes were framing the scope of the project, since not only a future vision of a certain societal situation was envisioned, but also a concrete technical solution. The participants were not allowed to bring their own visions to the fore – and other technical or non-technical solutions to sustainable food were not made possible in the visions. There were situations where participants were annoyed by this framing, but the process manager closed these debates, reminding everyone that definitions and problem choices were not open for discussion. The fact that the scope had been decided in advance was not communicated to the participants.

One way of making the status of the rules clear to the participants is to describe the method in writing, as part of the invitation of participants. The more or less rigid rules are often best communicated this way, leaving room to concentrate on the negotiable elements during the pTA process.

Participants Demand Changes in Procedures

PTA processes in general build on some sort of procedural consensus that has to be established between the arranger and the participants, and among the participants. If the participants do not accept the method as it is, negotiation has to take place, and a solution – a new procedural consensus – has to be found.

It is seldom that the participants demand changes to be made to the fundamental rules of a method, but it happens occasionally. 'Negotiable rules', on the other hand, are often challenged.

As just stated, it is important that the project management is aware of the opportunities and risks connected to changing the basic rules of the game, and in general it must be recommended not to change the rules that bear the characteristics of the method. In contrast, it must be recommended to be open when participants want to change a rule if, for example, the rule is only connected to the use of a certain technique in the process.

Case study findings:

- Ozone AU: the youth panel of the consensus conference was very sensitive to influence from the arrangers, and eventually did not want the help of a facilitator. The arrangers respected that decision, although as seen in retrospect, they should not have changed that rule.
- Biotech Baden-W. GE: lay people in one citizen forum wanted to see and comment on the arrangers' summary before publication. The arrangers invited the lay panel to a presentation of the results, and the results were accepted.
- Plant Biotech UK: the lay panel members suspended collaboration with their facilitator, because they found her unhelpful and manipulating. The choice of conference chair was questioned by lay panel members, because he had prompted them not to be too critical towards biotechnology. The arrangers did not accept the change to another chairman, although the choice of chairman must be regarded as a negotiable rule.
- Gene Dialogue CH: a change in plans took place. Lay people did not want everyone on the stakeholder panel to answer all questions, and they did not want written answers, but would rather put forward the questions orally at the main event (conference). The management accepted these changes.

Formalising Rules by 'Letters of Understanding'

In some cases, the arrangers make use of formal 'contracts' about rules with the participants (in one, literally a contract was signed) (Plant Biotech UK; Sustainable Menu NL; Gene Dialogue CH). One of these projects had considerable problems concerning the collaboration between management and participants, which might reflect that the formal rules did not cover the need for common understanding of and agreement in the procedures and rules.

In other cases, a process of discussing rules and procedures was initiated by the management (Copenhagen Traffic DK; Electricity CH) apparently with a much better result. It may be that signing a paper can even have the opposite effect than originally intended, because it might provoke a suspicion that 'these people are trying to catch me in some sort of agreement that I will regret later on'. Discussing the roles may take away such suspicion by making the relations between the players in the method transparent and understood.

Table 12.1 *Roles of Participants and Management*

Participation type	Role of participants	Role of management	Case study example[a]
Survey/interviews	Information sources	Researcher	(Gideon NL)
Deliberative survey	Evaluators/voters	Organiser and analyst	(Delphi AU; Drinking Water DK; Biotech Baden-W. GE; Novel Food NL)
Constructive dialogue	Stakeholders	Organiser and mediator	(Copenhagen Traffic DK; Urban Ecology DK)
Public consultation	Consultants	Organiser	(The four consensus conferences; Gene Dialogue CH)

Note: [a] only a selection of examples. Few of them are easily placed as one type of participation only, as most projects make use of more than one participatory technique.

Project Management's Influence on Content

The roles given to the project organisation differ depending on the specific project and method. There is a feeling that the more responsibility given to the participants, the more the project management gives up his/her influence on the content. Or, in other words, the more time the process management takes up, the more participatory the project is. This is illustrated in Table 12.1.

It is important to be conscious of the role of management, since confusion about this may end up as conflict between the participants and the management.

If management ignores the imbedded rules about split of responsibility, and acts as a participant or a researcher, when it should play the role of process consultant or practical organiser, then the process may get out of the hands of the project manager, and it may become difficult to get back into managing the process, since management has lost the 'virginity' of an unbiased, personally impartial participant. But the opposite problem is just as bad: if the participants rightfully expect the manager to take the lead regarding content – for example to suggest competent and relevant experts for a consensus conference expert panel – he/she should not avoid taking that responsibility with reference to the risk of introducing bias.

Case study finding:

- Electricity CH: ran into time pressure problems at one of the preparatory weekends with the lay panel, which meant that the choice of experts provided problems. The lay panel intended to do it, but in practice it was not arranged accordingly. Project management ended up making a decision together with the lay panellists, and some lay panellists stated that this help should have been planned from the beginning.

Table 12.1, in more general terms, represents a spectrum of participatory content of the methods. From top to bottom in the scheme there is a growing level of participation, coupled with a growing level of discourse ethics

(enlightenment, open-mindedness, authenticity and transparency). The more the arranger or manager gives up his/her own ambitions (or other motives) to be the one researching and concluding, the more credibility the project will gain. For this reason alone (the negative proportionality between the manager's influence on content and the credibility of the project) it is very important to be aware of the split of roles between management and participants.

The discussion of the role of the project manager has a side that is concerned with the scientific viability or legitimacy of participatory processes. On the one hand, pTA is an activity that is based on knowledge (the scientific knowledge-base being very important for TA), builds up knowledge (see the discussion on the cognitive purpose of pTA at the beginning of this chapter), and has ethical standards connected to this activity. On the other hand, pTA is not in itself a scientific activity, as it does not rest on the positivistic scientific method (but rather on methods for social debates), and accordingly it makes use of other ethical standards.

The viability of pTA does not necessarily connect to scientific aims (the production of 'truth'), but much more often to aims of political and public discourse (the production of discourse that has 'credibility'). Obviously, this reason-for-living of pTA is not in conflict with science, but is a necessary addendum if scientific findings are going to be implemented properly in our societies.

To return to the role of project management, this has its implications for the professional profile of project managers. PTA project management does not contribute to a larger CV as a scientist, but the CV definitely grows in other directions. In order to perform a clear role as a project manager, it is necessary that the person – as well as the institution – is articulate about the kind of professionalism that is expected.

Text Transformation Problems

Procedures that are not self-documenting hold a risk that meaning is changed by the person who takes over and brings new information (text transformation problems).

As Table 12.1 shows, some methods leave a role for the manager to analyse or conclude on the participatory process. This might continue during the project, when information has to be summarised from one phase and given to the next (Urban Ecology DK; Gideon NL), or at the end of the project, when the results have to be analysed and transformed into policy options (Urban Ecology DK; Biotech Baden-W. GE; Gideon NL). Authenticity may be lost during such processes, lowering the credibility of the project as such.

Similarly, information made by the project management for use by the participants may lose meaning in the process. For example, research questions in surveys/interviews (Delphi AU; Drinking Water DK; Gideon NL; Novel

Food NL) may be misunderstood, or the respondents may use the question to put forward a meaning that does not fit the question. Respondents answering a question other than the one put to them is a generally recognised problem with survey-like methods. Participatory projects that make use of predefined questions during the process are likely to suffer from the same problem.

A solution may be to increase the authenticity through self-documenting processes, in which the participants themselves decide the scope of the topic, the relevant questions, the relevant answers, and the conclusions and recommendations. Methods that come near to such a degree of self-documentation include the consensus conference and the citizen foresight (Citizen GMO UK).

Don't Overestimate Their Knowledge, and Don't Underestimate Their Intelligence

This wise sentence above from the field of journalism seems to count for pTA too. In the cases studied here we find examples of information overload of the lay participants (Plant Biotech UK) as well as lack of information (Citizen GMO UK) and the participants seem to be fully aware of both kinds of problems.

It follows from the claim for an enlightened discourse that the participants of a pTA process should have available the knowledge they need in order to make their assessments. This may be in the form of information sources or, often better, in the form of direct access to experts. On the other hand, overload of information might occur when resources, time or focus are taken away from the process of deliberation, leaving the participant in an unfair situation where a product is expected from them, but they are not provided with the circumstances to make it.

Information overload may be forced on the participants because of lack of trust in their capabilities, but it is worth noting that first, there are no complaints about low quality of the participant assessments in our cases, and second, if an information overload occurs, this might in itself be the reason for a non-optimal product.

Lack of information may occur because of the concern that lay participants should not be educated to a level where they may become 'lay experts'. This way of interpreting the lay element of certain pTA processes might also arise from a lack of trust in the capabilities of the involved lay citizens, since it is based on the notion that an enlightened person loses the values and attitudes he/she had before he/she received the information. There is nothing to suggest from the case studied here – or from the experience of numerous pTA projects around the world – that the participants' basic values change because of the information given in the process, but it is evident that the lay people demand access to knowledge in order to gain a basis to form an opinion.

Conclusions

This chapter has taken up the different aspects of pTA management, as they appear in the 16 cases or as they are known from the experience of the EUROPTA team. In the discussion of the challenges of management, some ideas, 'tricks', conclusions and recommendations are given in connection with the specific managerial problem. These hints at possible solutions are not repeated here, but will rather function as a background for some conclusions and recommendations that are of a more general kind. The conclusions comprise conceptual issues as well as concrete recommendations to the further development and use of pTA:

- Discourse ethics seem to be useful as an overall frame for evaluating best practice in pTA management. There is, however, a need for further research, since the actual role of discourse ethics in pTA practice needs to be uncovered. Although touched on in the EUROPTA project, such research has been beyond our scope.
- There is a need for more research regarding quality criteria for the outcomes of TA, as these ultimately make up an important guideline and evaluation tool for project management.
- PTA experience and research has developed to a level at which its seems relevant and feasible to head towards the establishment of an actual 'cookbook' that:
  - describes the qualities of the different methods in use;
  - describes problems to be aware of, and possible solutions to the management of different phases of TA projects;
  - describes the procedures of standard and variant methods.
- It must be recommended to take a step-by-step approach when managing methods that are new to the arranging institution. Adoption of methods should be done with some humility with regard to the original format, only changing the parameters of the method if absolutely necessary. The specific characteristics of a method, in particular, should be preserved, at least until the experience with the method allows for change.
- The practice of pTA in the cases studied is generally of a high standard. However, there still seems to be a difference between the management by 'first-time users', and that of more experienced institutions. A pertinent conclusion from this observation is to emphasise the need for continuity in the use of and build-up of expertise about pTA methods in the European countries and the institutions involved in TA.
- Inexperienced pTA project managers – everything else being equal – must be expected to take less optimal decisions, as compared with the work of experienced pTA staff. The case studies support this suggestion. This refers to the establishment of international training and courses in pTA theory and practice. The expertise for establishing such courses is available.
- There is a need for a coherent and comprehensive set or system of criteria about the strengths and weaknesses of pTA methods. It is a challenge that

really should be followed up, to develop an analytical tool that can be used for the choice of methods in pTA.

- Project management has to be effective in all its aspects. If not, the activity cannot be expected to give rise to big changes or impacts. It seems to be particularly problematic if the management:
  - does not take into account the needs of the 'customers' (by a proper problem definition, suited project set-up, and a targeted management); or
  - is not based on a reasonable degree of discourse ethical practice; or
  - does not ensure a proper communication – of process as well as outcomes – by establishing communication lines to the addressees.
- Although some aspects of project management are not optimal, the project may have been positive for the participants or the arranging institution, as a learning process or as a necessary forum for dialogue.
- Since politicians or decision-makers are important target groups for pTA activities, it is a challenge to develop methods that specifically aim at politicians as participants. No existing method seems to be able to solve the problem that politicians cannot spare large amounts of time as participants or audience in pTA projects. Consequently, there is a need for methods that focus on the needs of politicians and at the same time provide them with the broad scope that is characteristic of pTA projects.

This chapter has focused on problems, which may leave the reader with the erroneous impression that pTA always goes wrong. On the contrary, the case studies in the EUROPTA project show, in general, that pTA exercises in Europe are of a very high standard. Errors are made of course, and the aim of this chapter has been to bring them out into the open in order to learn from them. In the hope that this approach has been and will be well received, the fnal conclusion of this chapter shall be: *Let us be open about bad as well as good experiences, because we can learn from both*.

Chapter 13

The Choice of Participatory Technology Assessment Methods

Josée van Eijndhoven and Rinie van Est

Introduction

This chapter looks at the relationship between the participatory technology assessment (pTA) method, the situation in which the method was applied and some design elements. As mentioned in the analytical framework (Chapter 3), for instance, it is more likely that ethical questions are delegated to lay people, whereas questions related to uncertain data or risk assessment are more likely to be discussed in expert panels and with organised interest groups. Another issue mentioned in the analytical framework is the important role of the maturity of the technology and the types of questions that can be dealt with at an early stage or at a later point in time. At an early stage the opportunity to influence the development is relatively high, but little is known about possible impacts. At a later point in time influencing the development may be rather more difficult, but at least much is known about the effects. The problem setting of a pTA is an important design criterion. In this chapter we use the information from the case studies to analyse a number of issues that may clarify which forms of pTA have been used in what situation and draw conclusions about the design choices that an organising institution has to deal with.

The following relates the type of pTA that was used for the issue that gave rise to the TA activity. This also includes looking at the situation around the technology: the stage of technological development, the type of problem encountered and the social situation around the technology. Following this, the analysis delves one level deeper into the set-up of the pTA by reflecting on a number of *design characteristics*: the relationship to (political) decision-making, selection of participants, communication rules within the pTA arrangement and the way problem framing is dealt with in the arrangement.

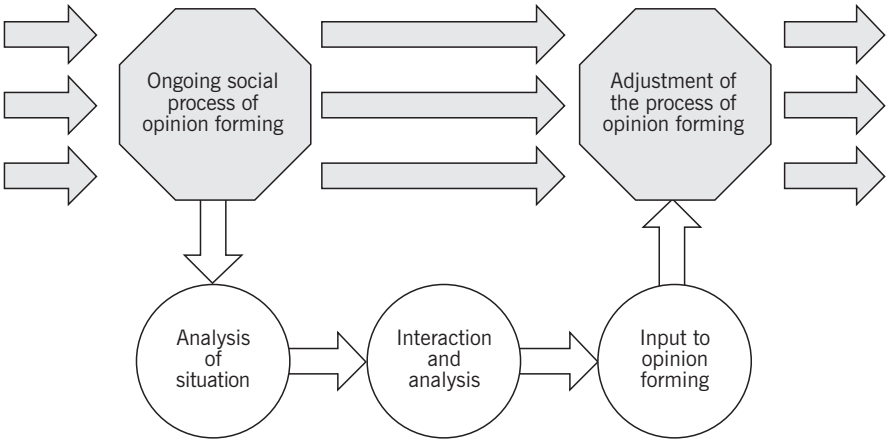

Figure 13.1 *Relation between Technology Assessment and the Ongoing Social Process*

Analytical Approach

Technology assessment and therefore also pTA can be viewed as intervention in society: the intervention aims at changing aspects of the ongoing societal process (see Figure 13.1).

Problem-Setting

Typically the starting point for setting up a pTA arrangement will be a situation in which a certain scientific or technological development has come under scrutiny (e.g. biotechnology) or is seen as implicated in changing a problematic situation (e.g. as a help in getting a more sustainable direction of development). If the situation is clear-cut in the sense that it is clear which measures can solve the problems of the technology involved or how the technology can solve the problems at hand, a TA would not be asked for. Situations where TA is called for are those in which uncertainty and/or dissent exist on facts and/or values. Especially in the case of dissent over facts and values, participatory arrangements are in order (Grin *et al.*, 1997).

Such situations are typically complex, and differing views of what the problem is, will be entered into the situation. The institution setting up a pTA arrangement will have a problem definition of the situation to start with. But typically, this problem definition will shift in the course of the activities. As a result of the activity, interactions and responses of actors, the problem definitions of the involved actors change, as do the perceptions, relations and roles of those actors. The problem-setting therefore entails a view of a specific situation including not only the scientific or technological development itself but also the societal setting of it.

Methods

The decision of an organisation to select a situation for pTA entails the choice of a method, a way of intervening. The method and strategy chosen will be in accordance with the organisation's analysis of the issue. The TA organisation will hope to contribute to taming (part of) the problem situation. It will choose a method in such a way that it may hope to intervene in the problem-setting in a constructive way, constructive for the problem as perceived (at least by itself and hopefully by others, lest it looses its legitimacy) and constructive for its own position.

The method or methods chosen in a pTA arrangement constitute the design of the planned societal intervention. Without a design, although possibly incomplete and partially experimental, we would not speak of pTA. The design attempts to structure the societal intervention. The structuring can be seen as a way in which the organising institution tries to channel a transformation of the problem-setting.

Forms of (p)TA

With respect to participation, we distinguish between three types of TA: classical TA, expert/stakeholder pTA, and public pTA. This distinction is based on the type of actors (not) involved in a TA.[1] In classical TA only the TA researcher or expert is involved. The result of the TA is a report, which is intended to provide a neutral, factual input to decision-making. The former US Office of Technology Assessment (OTA) stretched this concept of classical TA by involving stakeholders in the advisory panel and the extensive external review process (see e.g. Van Eijndhoven, 1997).

Whereas OTA involved stakeholders in guiding the TA and reviewing its result, stakeholders were still outsiders. When experts or stakeholders become actively involved within the TA process, we speak of expert/stakeholder pTA. Finally, we speak of public pTA when citizens play a central role in the method.

In the EUROPTA project, the following pTAs were directed at involving experts and stakeholders:

- Delphi AU
- Gideon NL
- Novel Food NL
- Traffic Forum AU
- Copenhagen Traffic DK
- Urban Ecology DK
- Discourse GMP GE.

1 These three categories relate to a discussion of four paradigms of TA by Van Eijndhoven (1997). In contrast to classifications based on the democratic role of TA in society (e.g. Bechman, 1993), we use a purely descriptive – in fact common-sense – way of typifying (p)TA. See also the analytical framework.

Citizens played an active role in nine pTAs:

- Ozone AU
- Plant Biotech UK
- GM Animals NL
- Electricity CH
- Biotech Baden-W. GE
- Citizen GMO UK
- Sustainable Menu NL
- Gene Dialog CH
- Drinking Water DK.

In the Gene Dialogue and the voting conference on Drinking Water, citizens play a role side by side with experts, stakeholders, or politicians. We categorised them as public TA, because forms of TA in which members of the public play an active role need specific attention to that factor, whereas in all forms of interactive TA experts are somehow involved, even if only as a resource person.

Analysis of the Problem-Setting

In this section we explore the relationship between the problem-setting and the choice of method. We defined the problem-setting as a situation that gives rise to a felt need for intervention. This section explores the way in which various variables in problem-setting influence the choice of method and relates this to the method(s) chosen in the cases.

In the analytical framework the setting that gave rise to pTA was very generally described as a perceived need for bridge-building in or between four important communities in society: citizens, politicians, experts and stakeholders. Different types of problems may inspire an institution to organise a pTA project. The reasons may be related to uncertainties or risks of a technological development and/or the surrounding structures and relationships. An institution may set up a pTA arrangement when it perceives a need for building bridges between actors. However, it is likely that it is also important whether such a perception is widely shared, which is more likely when an issue is high on the public agenda.

Therefore, in analysing the problem-setting we will take the following variables into account:

- the characteristics of the technological development and/or the situation in which the technology is implicated (the technological system);
- the characteristics of the societal arrangement around the technology or the technological system;
- the characteristics of the actual situation: does the issue figure on the public agenda?

In discussing each of these three variables the characterisation of the problem-setting cannot be taken independently from the institutional setting of the organisation setting up a pTA arrangement. The problem definition following from the analysis of the problem-setting is not a given but strongly mediated by the problem perception of the analyst, the analysing institution and the arrangements involved in problem seeking. That is, a certain problem definition may well be seen fit for a (p)TA by an institution involved in implementing a policy, but not by an institution working for Parliament. The latter point is not looked at further in this section.

Characteristics of the Technology

TA is primarily associated with new and emerging technologies and with the questions that arise because of a lack of uncontested knowledge about their impacts, a lack of consensus on the related normative issues and/or a lack of capacity of the (political) system to steer technology development. Uncertainties and the threat of growing inequality may lead to a non-optimal development of the technology. Apart from situations in which new technologies lead an institution to set up a TA project, there are also situations in which it is not a newly developing technology that leads an organisation to consider TA, but an existing situation, in which TA can be a decision support tool.

Therefore there are at least three types of situation concerning science and technology in which an institution considers TA:

A. Relatively new scientific or technological developments that have come or may come under scrutiny because of the possible negative impacts that some actors fear. Examples of such technologies are biotechnology and nuclear energy.
B. Relatively new scientific or technological developments in which groups that are or will be confronted with the developments in due time are not or are too little actively involved, with possible detrimental effects on the direction that the development takes, given the path dependency of technological development. Information and communication technology (ICT) is an example.
C. Situations in which technology is seen as a possible means of support for change in a desired direction, as is the case in the quest for sustainable development.

In situations A and B the technological development may be in a rather early phase of development and therefore the situation is on one 'horn' of the Collingridge dilemma: little is known about possible effects. In that sense there is no difference between A and B. But in situation A there is awareness of the fact that there is an issue at stake, most likely there is also already a lively societal debate on aspects related to the issue. In situation B the technol-

ogy may still be debated, but – as in many instances around ICT – the debate may be limited to only a relatively small number of aspects (e.g. economic) and actors (e.g. economic actors).

In situation A, questions arise concerning the reality of the presumed risks, and ethical concerns may come to the fore. Important questions therefore are, how should the possibilities generated by new scientific and technological developments be gauged? Should they be accepted because of the supposed benefits, or should they not because of conflicts with normative viewpoints or because of possible risks that emerge. Is it possible to make cost-benefit analyses or should ethical concerns (positive as well as negative) outweigh such calculations?

Whereas in situation A an important driver of the societal debate and of the wish to assess scientific and technological development is the existing or feared resistance amongst some stakeholder groups and a large, but sometimes unknown, part of the population, in situation B no such driver exists. In examples such as ICT, great efforts are made in many countries to stimulate the development of technology because of its potential. Those interested in the potential, mainly, but not only, for economic reasons tend to push the development, whereas other actors lag behind. However, a lack of scrutiny on the part of these actors may be to the detriment of the direction in which the development takes place. If in such cases TA is conducted, one could call this early warning TA, because it is directed at avoiding future problems. However, contrary to earlier ideas about possible roles of TA, it is no longer a widely held belief that negative effects can be foreseen; now this form of TA is seen rather as a guide for making choices.

In situation C the role of technology may be less obvious. Such is the case in the search for sustainable development, where technology shifts may be seen as positive options. But in this category it is less clear which technological options are implicated and what role they play in addressing the problem situation. Typically the starting point from where a TA arrangement is set up will be a problematic societal situation such as traffic, the quality of water supply or the management of water systems. In these situations, technology is implicated in two ways. Technology is part of the shaping of the present problem situation because without technology the situation could in many cases not have existed in its present form, but technology can also be part of the answer by generating options for solving the problem. Typically in these cases the implied technology is less visible than is the case in situations A and B where science or technology is the starting point for the problem definition.

Social Arrangement

The social arrangement of a technology, a technological development or a technological system can be analysed in a number of ways. One, well-known way is to make a societal map, in which the relationships between actors

involved in the technological development are analysed. Societal maps can enable the analyst to discern obvious 'gaps' in involvement and strong and weak links between actors. For instance, in the project 'technology for the handicapped' of the Rathenau Institute it became clear that organisations involved with research were strongly linked, but had only weak links to organisations providing handicapped people with supporting devices.

A full-blown societal map may be suggested for arriving at specific recommendations to enhance the co-operation between specific groups or to generate a specific information flow. However, to choose a pTA arrangement, a more basic approach might be sufficient. This approach is derived from Bunders and van Eijndhoven (1987) and from van Eijndhoven *et al.* (1987).

At the basis of the idea to set up a pTA project is the fact that the situation around the technology warrants an intervention to shift the existing situation, and more specifically an intervention that involves some form of participation. Presumably, therefore, the participatory arrangement will involve actors or individuals who, without the arrangement would not have been involved in the decision trajectory or will involve them in an alternative way. Bunders and van Eijndhoven divide actors concerned with technology development into primary and secondary actors; primary actors being those involved in decision-making and secondary actors being those not involved. A division between involved and not involved may be too strict, certainly if one views a decision-making process as a trajectory. But it may still be fruitful to view the social arrangement around a technology as one in which core actors and non-core actors are involved. A pTA arrangement can then be seen as an effort to broaden the conceptual and/or the participatory basis for decision-making by bringing more actors into play. The question to be answered becomes: which actors need to get involved, and for what reason? Each pTA method is an answer to this question but also to the question of how the organisers think such a broadening can be achieved.

Whether a pTA method is fit for a certain situation can further be analysed by looking at the way the technology is institutionally embedded. To assess the degree of embeddedness we can analyse two characteristics of the problem-setting. These are the *degree of institutionalisation* and the *degree of antagonism* (Bunders and van Eijndhoven, 1987).

The *degree of institutionalisation* indicates the strength of the settings. For instance, in many countries there are strong and powerful institutions around socio-economic questions in which labour movements, employers and the State are involved. Likewise the structure around energy production or the road infrastructure are in most cases strongly institutionalised. In such cases there may be a strong demarcation between those who are normally involved in decision-making processes and those who are not (primary and secondary actors). On the other hand, in the development of a new technology, in many cases institutionalisation is much weaker and the division between primary and secondary actors may be much less clear-cut or at least less fixed. For instance, the boundary between primary and secondary actors in biotechnology is still very much open to shifts, whereas in areas like the

former monopolies on telecommunication, clear State interventions were needed to open up the actor groups involved.

The *degree of antagonism* is a second important dimension because it indicates how difficult an intervention may be. In an antagonistic situation, it may be difficult to intervene, especially if there is strong institutionalisation, because then the existing societal arrangement should first be delegitimised, which may be something that a TA institution is not able or probably not willing to do. Actors involved in a pTA arrangement may be aiming at deconstructing the status quo, but feel unable to do so. One way of explaining why environmental organisations left the Discourse GMP in Germany is that they were not able to express their perspective well enough over the counter. In such cases, additional information and analysis may be needed to put the discourse on a different footing. This may be a counter indication for a pTA arrangement. A more traditional TA method may be more appropriate in this case.

The Public Agenda

The reason for viewing a situation as warranting a pTA set-up may be acute or not. In some cases a media hype may lead to requesting such activities. The case of cloning is an example. Another immediate cause may be a concrete request by an important actor. A third type may be a natural event, like heavy rainfall leading to reconsideration of water management. In these three situations the public attention to the issue is at first, close. In many cases, however, the reason for starting pTA is the felt need for broadening the basis for decision-making on technology without a broadly shared feeling of urgency.

Whether the cause for setting up a certain pTA project is immediate and visible or more distant is an important variable in choosing a method and in designing the project, although it may be more important for the management of the project than for the choice of method *per se*. In an acute situation, quick operation is urgent, because it is likely that others will not stay idle and the urgency may lead to many actors becoming involved. The effort may be wasted if the pTA activity does not gain cognisance or if decisions are taken before results are generated. A strong institution may be able to monopolise the intervention, but, more likely, others will develop their own strategies for intervention. In that case the organisation has to decide whether to stay out of the issue or to tune its activity with that of others by co-operation or otherwise. The acuteness of a situation may also prevent certain methods from being fruitful.

More generally an important characteristic is whether the issue addressed is visible on the public agenda: is it reported on in the media and thereby widely recognised as being an issue? If an issue is not visible, it may be more difficult to gain attention for it and to involve people who do not directly have a stake. Even more extreme is the situation where the issue addressed in TA does not figure on bureaucratic agendas either.

An advantage of a non-acute situation is that there is more leeway with respect to timing. It may even be that it is difficult to find a good moment to get attention for the results. In that case it is important to seek actively for a good moment or to create an event. Creating an event may be relatively easy for institutions with good relationships with the media, but not otherwise. Creating an event may be done by involving well-known people, like popular ministers or royalty, but it may also be possible to create events by building on possibilities generated by smaller events, such as international conferences, accidents and parliamentary debates.

Choice of (p)TA

Looking at the case studies in the light of the above discussion on the situation of the technology, the social arrangements around the technology and the presence of the issue on the public agenda, we can try to relate the problem situation to the type of pTA that was conducted. In Table 13.1 we bring together the main characteristics of the problem-setting in the cases conducted.

We, again, put the cases into the category expert/stakeholder TA and public TA. For each of the cases we indicate whether the situation around the technology involved corresponds to situation A, B or C as introduced before. We also indicate two characteristics of the existing social situation surrounding the technology. The first is the degree of institutionalisation, here denoted by the term *fixed*, because it is not so important whether institutions exist but how fixed the relationships are and how closed they are to the outside world. The second is the degree of *antagonism*. In an antagonistic situation, there are clear differences of opinion and/or interest. In the last column we indicate whether the situation is one in which there is public debate around the issue.

Relationship between Type of TA and the Characteristics of the Technology

An interesting observation from the table is that almost all type A cases are in the category public TA. This corresponds with our initial expectation that ethical questions are more likely to be delegated to lay people than issues involving uncertain data or risk assessment. It is not exactly the same, however, because the issues discussed in the cases categorised as public TA in our table can involve ethical as well as data and risk aspects. We should make a closer analysis of the division of roles within the cases to be able to address this question. It may be that the risk discourse is delegated to the experts involved.

Another interesting observation, however, is the degree to which type C cases show to be expert-stakeholder TA. It is not clear whether there are good reasons why citizens could not be involved in those cases. If anything, those

Table 13.1 *Problem-settings of Various Case Studies*

Type of pTA EUROPTA case study	Technology	Societal situation Fixed	 Antagonistic	Public debate
Expert stakeholder pTA				
Delphi AU	C	+/–	–	–
Gideon NL	C	+	+	+/–
Novel Food NL	C	+/–	–	–
Traffic Forum AU	C	+	+	+
Copenhagen Traffic DK	C	+	+	+
Urban Ecology DK	C	+	+/–	+/–
Discourse GMP GE	A	–	+	+
Public pTA				
Ozone AU	C?	(–)	+	+
Plant Biotech UK	A	–	+	+
GM Animals NL	A	–	+	+
Electricity CH	C(A)	(+?)	+	+
Biotech Baden–W. GE	A	(+/–?)	+	+
Citizen GMO UK	A	–	+	+
Sustainable Menu NL	C	–	+/–	+/–
Gene Dialog CH	A	–	+	+
Drinking Water DK	C	–	+/–	+/–

situations can be better gauged by citizens than many of the type A cases. This may have nothing to do with the a priori feasibility of arranging a pTA in such cases, but with the fact that other methods are considered to be more effective. In many type C cases, as opposed to type A situations, there may exist a relationship which is fixed with the social situation.

The finding also allows a rather more negative conclusion, namely that the use of public pTA is not so much driven by the wish for democratisation, but born out of embarrassment: public pTA as a means out of an impasse. Some evidence may be found in a case that was not part of this study (Hoppe and Grin, 2000). In this project on traffic by the Rathenau Institute, stakeholders and politicians involved did not feel the need for a confrontation with citizens to make up their minds.

No clear examples of situation B are found amongst the cases. Of course, with a sample of only 16 cases, the lack of type B cases may be due to the way the cases were selected, and probably cases of type B could in fact be found. However, alternatively and even more likely is that pTA is not the method of choice for issues in this situation. Presumably, a situation in which non-evident sub-optimisation of a technological development takes place is not a good case for conducting TA in a participatory way. In van Eijndhoven (2000), the example of the *Fatima* project is discussed with reference to telecommunication technology, where the analysis of the problem situation led to the conclusion that there was an urgent need for critical analysis of the development and only thereafter were interactive processes in order. From our findings, we may draw the tentative conclusion that in a case where the issue can be placed in category B the method of first choice will not be a pTA method.

This should, however, not be interpreted as a categorical dictum. There are three reasons to consider more classical forms of TA in those cases:

1 The first has to do with the lack of well-developed arguments to be entered into the interaction. With respect to that argument one can say that a TA arrangement, if it is to involve live interactions, should not only be interactive but also include assessments of other kinds to develop the reasoning.
2 The second is one of timing and context. In Denmark, pTA projects and even public TA projects have been conducted in the area of ICT (Klüver, 2000). It should therefore not be seen as an overriding law that pTA should not be conducted in a type B situation. It may well be that pTA becomes feasible for such an issue as soon as and only if pTA has gained credit as a standard way of conduct in a democratic society.
3 The third is one of design. PTA, and certainly public TA needs to be seen as relevant to those involved. For situations of type B, the relevance is less easily perceived and therefore the mortgage on the TA arrangement may be heavier.

Choice of pTA and the Social Arrangement around the Technology

Table 13.1 shows a division between the degree of institutionalisation observed for the expert/stakeholder TAs and the public TAs. Apparently in a heavily institutionalised situation, where the roles are relatively fixed, TA is more directed at opening up the existing situation by introducing new stakeholders or confronting the old ones in a new way than by involving citizens. Presumably it is felt that rehearsing the old interests in front of a new public does not lead to new insights nor to the desired shifts in arguments (see the aforementioned example by Hoppe and Grin). Interestingly, public TA is mainly applied in cases where the degree of institutionalisation is low or the existing institutionalisation is contested.

It is perhaps not surprising that most cases in which pTA was conducted present antagonistic situations. Because organising pTA is very resource-intensive, it can be understood that those resources are only made available in situations were stakes are high.

The existence of a public debate is also seen to be of relevance. In a situation were there is no public debate it may well be difficult to interest citizens to get involved with a pTA. In that case expert/stakeholder TA may be the method of choice, although even here, the issue should be on their agenda or at least be seen as relevant. In case an organisation thinks public TA is called for even if an issue is not on the public agenda, efforts should be made to find inroads to bring it as close as possible to an issue seen as relevant by the public.

The characteristics of the technology, of the societal situation surrounding the technology, of the actual situation and of the planned intervention all are

relevant for the choice of TA method. The various dimensions just discussed can be used in a checklist for choosing pTA methods.

The pTA Design

The first question a TA organiser has to address is, should we set up a participatory or a non-participatory TA? The former section shows that when opting for a participatory TA arrangement, a TA organiser can basically choose between two types of pTA: public pTA and expert-stakeholder pTA. We found that the problem-settings in which TA organisers select public pTA or expert-stakeholder pTA differ widely. When a relatively new technological development is involved and the degree of institutionalisation is relatively low, organisers mostly opt for public pTA. In contrast, expert-stakeholder pTA is used when the institutional setting is fixed. In these cases, technology seems to offer an opportunity for change.

In this section we study the type of design decisions involved in both expert-stakeholder and public pTA. On the one hand, there seems to be a crucial difference between involving citizens or experts and stakeholders. In contrast to experts and stakeholders, citizens do not represent a specific interest nor have a clearly defined position within the problem-setting that the pTA is dealing with. Citizens are supposed to represent the general public interest. Moreover, experts and stakeholders will have a history within the problem-setting, and will play their role within the problem-setting before, during, and after the pTA. In contrast, the lay people involved are likely to play a temporary role and will normally leave their involvement with the problem-setting after the arrangement has ended. Since the connections between the involved participants within public and expert-stakeholder pTA are so different, we may expect the design characteristics between these types of pTA to be qualitatively different. Consequently, we will analyse the two types of pTA separately in order to compare them.

Participatory TA as a Transformation of the Problem-setting

We consider the pTA arrangement to be an artificial transformation of the problem-setting in order to change that setting for the better. Accordingly, we characterise a pTA as a set of transformations. Each transformation will involve various design decisions. For example, spatial transformation is an obvious transformation type involved in almost every pTA. Although obvious, to take people out of their normal setting, and bring them together into a pleasant physical environment is an important success criterion for pTA. Design decisions involved are: selecting a nice location, paying travel costs, etc.

Here we focus on four basic transformations: relation to (political) decision-making, participation, interaction and problem framing[2]. Each type

2 See analytical framework, Chapter 3 ('Set-up and Process', and 'Values, Assumptions and Goals').

of transformation challenges the pTA organiser in various ways, and provokes various design decisions or dilemmas (see Pröpper and Steenbeek, 1998).

Relation to (political) decision-making

Participatory TA is often said to foster a 'creative space' outside the political decision-making process. Not all pTAs, however, occur at arm's length of the political process. The Salzburg Traffic Forum is a point in case here, in which the outcome of the pTA is supposed to play a direct role in politics. To position a pTA at a certain distance to the political world is an important type of transformation[3]. Creating distance with respect to the (political) decision-making process can be done in various ways: by selecting participants who play a role behind the scenes, by putting a long-term perspective on an issue, by clearly separating the pTA from the political process, etc.

We talk of a *direct* pTA arrangement when the outcome of the pTA is expected to have a direct or non-mediated impact on the decision-making process[4]. In the case of an *indirect* pTA, no direct commitment of decision-makers is expected. In this case the impact on the (political) decision-making process is less straightforward. External commitment may be created during the process and/or mediators may be used to translate the results of the pTA into (political) action.

Participation

A second type of transformation involved in pTA is selection of participants[5]. It is exactly this type of transformation that distinguishes pTA from classical forms of TA as well as the public from expert-stakeholder pTA. Here, we will focus on design issues, such as how many actors should be involved in the pTA, what kind of actors should play a (central) role, etc. In particular, the issue of representation poses a real challenge for the organiser of a pTA.

Interaction

A third type of transformation concerns the communication rules that apply within the pTA[6]. The rules of a pTA can be classified as: rules that cannot be subject to negotiation, rules that are set, but may be negotiated, and rules that are defined by the participatory process (see Chapter 12).

Problem framing

Finally, framing of the problem-setting presents an important type of transformation[7]. Friend and Hickling (1997) present five broad dimensions in which the organiser of the pTA needs to make a choice. There is a choice

3 See text under heading 'Design' in Analytical Framework (Chapter 3).
4 See [3].
5 See text in section 'Participants' in Chapter 3.
6 See text in section 'Interactions' in Chapter 3.
7 See text in section 'Problem definition' in Chapter 3.

between a more focused or synoptic treatment of problem scope, between a more simplifying or elaborating treatment of complexity, and between a more reactive or interactive treatment of conflict. There is also a choice between a more reducing or accommodating treatment of uncertainty. Finally, the organiser may choose a more exploratory or decisive treatment of progress through time.

The following sections discuss how pTA organisers have dealt with the design questions or dilemmas involved with each of the four basic transformations in the case of public pTA and expert-stakeholder pTA, respectively, and compare similarities and differences in design between the two broad types of pTA.

Public pTA

An explicit role for citizens can be found in nine out of the sixteen EUROPTA case studies. The public pTA arrangements aim to give the citizens' voice a proper place within the social debate on a certain technology-related topic and to stimulate public debate around that topic. Participatory TA arrangements aimed at these two objectives were denoted as public pTA. Whereas specific designs in order to reach these two goals differ widely, organisers of public pTA seem to face similar type of design issues.

Relation to (Political) Decision-making

In most public pTA cases the relationship with the political decision-making process is weak, and it is up to politicians to take the outcome of the pTA seriously. Whether the outcome of a pTA is taken seriously by the political system depends on the history of that method within a certain political culture and the attitude towards that particular method. For example, the Swiss PubliForum (Electricity CH) was an attempt to break new ground for the consensus conference within Switzerland and to see whether the Swiss political system could appreciate such a method. It seems that the appreciation for certain pTA arrangements differs across various political cultures. Most organisers seem to be aware of this fact and adopt their designs to a lesser or a greater extent. Analysing the transformation types participation, interaction, and problem framing can be used to check this thesis.

Participation

The direct role played by citizens within a certain problem-setting is often marginal. In contrast, citizens play a central role within public pTA. On 7 June 1998, a Swiss referendum was held, which aimed at prohibiting several applications of biotechnology. Let us, for the sake of argument, regard the Swiss initiative as a public pTA. This event involved all entitled voters. In the public pTAs under scrutiny, however, selection had to be used to make the

pTA manageable and affordable. How could citizens be selected in such a way that the result of the pTA is seen by the outside world as representing (to a large extent) the public's view? The cases show the variety of ways in which pTA organisers tried to deal with this question.

For a consensus conference, normally about 15 people are selected as panellists. Through advertisements in the papers, interested lay people are invited to join the public panel. From the applicants, 15 to 20 people are selected in order to gain a wide diversity of different people and, related to this, a wide variety of public viewpoints[8]. The selection criteria can easily be adapted to a particular political context. For example, the Swiss PubliForum had proportional numbers of French, German and Italian-speaking Swiss in its lay panel. This seems to be a logical prerequisite for a diverse Swiss lay panel. The disadvantage is that the lay panel becomes larger and presumably more difficult to handle.

Organisers of consensus conferences do not normally claim that the selected public panel is representative of the whole (national) population[9]. Despite this, the method is often criticised due to the fact that some 15 people can never represent the whole population. The Dutch media constantly highlight this issue. The remedy of the Dutch organisers was to leave out the demand for reaching consensus. In this way, the organisers emphasised that showing a variety of public views is more important than reaching consensus. Despite this, the critique remains.

The Danish voting conference (Drinking Water DK) shows an interesting example of how one might deal with the issue of representation. After the voting conference, a major poll was held to check the outcome of the citizens' vote at the conference. The survey produced the same results and proved that the outcome of the method was representative for the whole Danish population. In Switzerland, the results of a survey were used to select participants with a diverse set of views. The PubliForum's (Electricity CH) outcome turned out to be in line with the results of the survey. This fact considerably strengthened the credibility and applicability of the outcome of the PubliForum in politicians' eyes.

The German Citizen's Forum method (Biotech Baden-W. GE) shows another approach to the problem of participation. Instead of one lay panel, some eight panels with, in total, 194 participants have been organised. It is possible to even increase the total number of participants. In Great Britain, the Wellcome Trust is at the time of writing organising the largest public panel ever, involving almost a thousand people. In this way the Wellcome Trust is attempting to get results that are indeed representative for the whole British population. These examples seem to show that the ways in which the problem of participation is dealt with differ amongst the various political cultures. While, in Denmark, the issue of representativity has not caused major

8 This only works when a sufficient number of people respond to advertisements. For example, in the case of the South Korean consensus conference on cloning, held in September 1999, only 17 people responded.
9 However, most organisers still strive for representativity.

problems, the critique in countries such as Germany, Great Britain and the Netherlands is much louder and consequently organisers are forced to address this criticism.

In organising a 1,000-people-strong public panel, the Wellcome Trust is trying to address the issue of representativity. Although this huge and expensive set-up will probably be successful, the Swiss and Danish experiences (Electricity CH and Drinking Water DK) seem to imply that there is an easier and cheaper solution, that is, to combine the organisation of a diverse small (15–20 participants) public panel with survey techniques. Survey techniques can be utilised before, during and after the pTA.

Interaction

The citizens' role versus that of experts or stakeholders is a crucial design characteristic. The consensus conference is normally depicted as enabling a balanced dialogue between citizens and experts and stakeholders. Some argue that stakeholders and experts act as information sources and transmitters within this method, whereas lay people are merely positioned as information receivers.

The Swiss dialogue on genetic testing (Gene Dialogue CH) deals with this critique by treating citizens and stakeholders both as information sources and receivers. The public and stakeholder panels enter into discussions and both panels write evaluative statements at the end of the pTA.

The Danish voting conference (Drinking Water DK) represents yet another interpretation of the citizens' role versus experts and politicians. Citizens, experts and politicians are regarded as equal judges of proposed policy scenarios. Finally, the Dutch sustainability debate (Sustainable Menu NL) limits the role of the public to that of an active audience. One might say that this method embodies only the public PTA objective of stimulating the public debate.

Problem framing

At a consensus conference the lay panel is allowed to set up its own agenda, select experts or stakeholders it wants to hear, and write its own report. This method embodies a synoptic treatment of problem scope and an elaborating treatment of complexity. The pTA is more involved with problem-finding than finding solutions. As noted above, a key difference between, on the one hand, the Dutch public debate (GM animals) and, on the other, the Swiss PubliForum and the Danish and British consensus conferences (Plant Biotech UK) is the (lack of) requirement for consensus.

In contrast to the consensus conference method, the citizens' forum (Biotech Baden W. GE) is at the mercy of a strictly planned, pre-defined lecture schedule and the organiser writes the final report. In the latter case, the commitment of citizens to the outcome of the pTA is clearly put to the test. The German case showed that some lay participants demanded that the report should first be presented to the whole citizens' forum before they would give their approval.

The main findings of this section are summarised in Table 13.2 (see page 231). In most public pTA cases, the relationship with the (political) decision-making process is rather weak. At the moment, most Danish parliamentarians acknowledge the added value of the consensus conference method, and its results are being appreciated as valuable input for the decision-making process. In other countries, MPs seem to be less acquainted with, and more sceptical towards, public pTA, or as the saying goes 'unknown, unloved'. In most public pTA cases, organisers tried to prove the relevance and worth of public pTA for politicians. In their country, the public pTA often represented a first attempt to promote public pTA.

Although organisers seldom claim that the outcome of the public pTA represents the voice of the people, its results are often criticised for not being representative. One way to address this criticism is to organise a larger number of public panels.

In public pTA, the citizens' role versus experts and stakeholders is a crucial design characteristic. We have found several roles. In most cases the citizens' panel receives information from an expert-stakeholder panel in order to make a 'lay' judgement. Lay information is made available to experts and stakeholders by means of a product. In the Swiss dialogue on genetic testing (Gene Dialogue CH) the citizens' and stakeholders' panel acted both as information sources and receivers. In this case, lay information is made available to stakeholders by means of an interactive process. The Danish voting conference (Drinking Water DK) positioned citizens, experts and politicians as equal judges of proposed policy scenarios.

Most public pTA embody a synoptic treatment of problem scope and an elaborating treatment of complexity. The focus is on finding problems rather than solutions. Whereas some public pTAs emphasise the need to find a common problem definition (consensus), others consciously give room for expressing a variety of views. In most public pTAs, the public panel is in control of its own agenda, inviting experts and writing the final report. In other pTAs (e.g. Biotech Baden-W. GE), the organiser defines most of the process and writes the final report. The latter may challenge the involvement of lay people and their commitment to the outcome of the pTA. In this case it seems advisable still to formally gain the public panel's approval on both the process as well as the product.

Expert-stakeholder pTA

As discussed, expert-stakeholder pTA is often involved with fixed, antagonistic problem-settings. The aim of the pTA is often to get away from this situation. Clearly, getting away from a certain situation by involving experts and interest groups that define that situation leaves the TA organiser with various puzzles or design dilemmas. Involving these types of actors in the pTA implies the danger of introducing the strategic behaviour and positioning that exist within the problem-setting in the pTA. The challenge is even bigger when

the pTA is supposed to affect the political decision-making process or when the related problem-setting is characterised by conflict. The following analyses how organisers took up these challenges, and set up the pTA in such a way that involving experts and stakeholders improved the situation.

Relation to (Political) Decision-making

All expert/stakeholder pTA cases, except for the Traffic Forum AU, can be seen as indirect pTAs. At the start of the Traffic Forum, the city council considered the Forum as a legitimate institute to produce a new traffic plan. The design of the arrangement was strongly criticised by the participants and was seriously altered during the process. Initial rules of participation and communication that aimed at creating an 'ideal speech situation' were attacked by participants and got shaped according to the rules that applied in the real problem-setting. Moreover, in the course of the event, the city council announced that it would no longer adopt automatically the traffic plan that would come out of the pTA. The pTA changed from a direct to an indirect one. This had a positive impact on the behaviour of the participants within the pTA, since a strategy of confrontation (which characterised the situation in the real world) was traded in for a search for compromise.

In contrast to the Traffic Forum AU, all other expert/stakeholder pTAs try to get away from the actual problem-setting and its related power games by putting a future perspective on the pTA. This helps to produce a *protected* analytic space, which enables participants to depart safely from established patterns of thinking. Although actors within the problem-setting often feel a need for change, change is often prohibited because of a lack of a consistent set of new ideas, and because of existing institutional barriers of a structural or cultural nature. Expert/stakeholder pTA may provide an experimental playing ground – without institutional barriers – to develop a coherent set of new ideas.

Emphasis on the future also creates several challenges. First, why should busy people become involved in a process that does not directly deal with the current problem-setting? Second, how can the results of a future-oriented pTA be translated into the actual (political) process? These questions will be addressed in the following sections.

Participation

In the Traffic Forum AU by properly selecting participants, the organisers aimed for a Habermasian '*herrschaftsfreie*' discussion. In order to achieve rational discussion between various interests, each interest was given the same number of representatives. In this way the method tried to circumvent the unequal power position of various interests within the actual problem-setting. In particular, actors who represented the business interest rejected the idea of 'one interest, one representative' and demanded a stronger membership in the

Forum. This 'revolt' led to replacing the initial representation model, which was based on discursive rationality, by one based on power. In short, since the outcome of the pTA was expected to have direct political impact, the participants demanded a participatory process guided by the rules of representation of the real world.

The future-oriented, indirect expert/stakeholder pTAs face other types of problems. The first is to get people interested in participating in the pTA. One way to tackle this is to present the pTA to a powerful actor. Actors will be aware that they will then miss an opportunity to exert influence when not participating in the pTA. A parliamentary TA institute is able to address its project to Parliament. For example, the results of the Gideon NL project were to be presented to MPs and used for evaluating the crop protection policy plan. Since the Delphi AU was commissioned by the Ministry of Science and Traffic, experts could see the relevance of the project.

Another way to get people involved is to gain support from powerful key players via other actors, also invited. The Copenhagen Traffic DK and the Novel Food NL chose this route. The organisers of the future search on traffic set up an advisory commission consisting of the main stakeholders, who were asked to select eight actors from each interest group. Within the Novel Food NL case, superiors were asked to approve of the pTA and to allow their subordinates to join the pTA.

A second question that needs to be addressed by organisers is, who should participate? Answering this question depends on the pTA's objective. The various pTAs differ with respect to the location or pole in the innovation chain that they address. As part of the interdepartmental Sustainable Technology Development Programme, the Novel Food NL focuses on the industrial R&D process. Accordingly, the engagement of industrial players (technologists and R&D managers) was crucial. In contrast, the Delphi AU produced input for setting up a governmental R&D policy, and relied on the active participation of scientific experts at the universities. Moreover, the Rathenau Institute (Gideon NL) and the Danish Board of Technology (Copenhagen Traffic DK) address the political process, and the crucial actors are interest groups and, ultimately, politicians.

A third design question is whether participants should be based on desired input in the process (e.g. expertise, creativity, power position) or be representative. In the Delphi AU this question was easy to answer since almost the whole Austrian expert community took part in the project. In most other expert/stakeholder pTAs, the organisers tried to find a balance between the issue of representation and the desired qualities of players.

In general, the following set of criteria were used to select participants:

- Overall, actors should represent a broad variety of actors and views within the problem-setting[10].

10 Using pre-defined interests, such as in the Traffic Forum AU, is counterproductive. Organisers should have a proper insight into the social map of the problem-setting before defining these interests.

- Participants need to be creative and able to explore new solutions and novel ways of defining the problem.
- Participants need to be in sufficiently senior positions, so they can mediate the results of the pTA to their organisation.

The Dutch Gideon project put emphasis on the second criterion. People from the 'shop floor' were invited, rather than people from general management, and prominent actors within the public debate were avoided. Instead, the organisers of the Copenhagen Traffic DK accentuated the third criterion in order to spread the message from the pTA.

Interaction

Again the Traffic Forum AU presents a good starting point for our discussion. The pTA was set up to open up the political deadlock with respect to traffic planning in Salzburg. This stalemate was largely due to actors representing business interests, who refused to budge an inch within the debate. Whereas the problem-setting was characterised by non-compromising behaviour, the pTA was supposed to enable a rational discourse between the participants. Since the stakes of this direct pTA were high, the pTA failed to create an 'ideal speech situation', and strategic games and behaviour entered into the pTA. When the pTA changed into an indirect one, the strategic behaviour of the participants shifted too. A search for consensus came to replace the strategy of confrontation. Maybe participants came to realise that a common statement was needed in order for any effect to be made on politics.

The indirect pTAs show that placing the pTA at a certain distance from the decision-making process makes it possible, to a large extent, to free the pTA from the strategic behaviour and unequal power positions within the real problem-setting. In this way it produces a temporary creative analytical niche.

Problem Framing

With respect to problem framing, several aspects can be distinguished. First, participants need to move away from their fixed viewpoints. Second, different frames of meaning have to be confronted and perspectives have to be accommodated. Finally, to be relevant for the current political debate, the results of the future-oriented pTA have to be translated back to the real world. We will briefly discuss these three items.

- A main goal of expert-stakeholder pTA is to move actors away from the daily routine. It takes a serious effort to guide participants away from their current mindset. The Gideon NL case proves this. At the start of the Gideon project the organisers had expected that expert interviews would deliver long-term perspectives on the issue of crop protection. This

assumption proved to be wrong, and the organisers decided to change the initial design of the pTA and to include an extra activity in the form of a future-oriented workshop. Owing to the creative character of the workshop, the goal of formulating various future visions was achieved.

Besides looking to the future, looking back into the past represents an important tool for establishing a creative space. For example, during the Copenhagen Traffic DK, people were asked to review, on the basis of their personal experience, Copenhagen's transport situation in the past 40 years. Afterwards they were asked to assess the present situation. In so doing, an attempt was made to prevent participants from simply stating their known positions.

- It is important to clarify to all participants the borders of the problem to be discussed in the pTA. The Novel Food NL dealt with novel protein foods as a substitute for meat. Environmentalists became annoyed by the restrictive treatment of the problem. Whereas the tight demarcation of the project did not allow an open political discussion, it did help to get industry involved and to develop an R&D programme.

  Within the Gideon NL project, the outer limits of the debate were determined by the idea that, in the long run, the Dutch agricultural sector needed to be economically viable as well as ecologically sustainable. This kept the project activities focused.
- Whereas a future perspective helps to escape the current political power games, it also limits the pTA's relevance to the current political decision-making process. This seems to be less the case when the outcome is an outlook to the future, as in the case of Delphi AU (a Delphi study) and Novel Food NL (an R&D proposal). One could argue that these two more expert-like pTAs are both future-oriented and directed towards finding solutions.

  The other more stakeholder-like pTAs are future-oriented and aimed at problem-finding. In these cases, translating the results of a pTA into action is less straightforward. Some organisers try to involve mediators to translate its result into action[11]. In the Copenhagen Traffic DK, participants had to hold sufficiently senior positions in order to be able to bring back the conference results to their organisations. Members of an advisory committee are also expected to play such a mediating role. In the Gideon project, a serious attempt was made to translate the outcome of the project into a form that could be directly used by politicians. This was done with the help of the advisory committee, whose members were expected to have a good feel for the relevant political issues and demands. The limited number of EUROPTA case studies seems to indicate that a special effort is needed (e.g. a separate design phase within the pTA) to translate the results of a problem-oriented pTA into results that are more 'ready-made' for (political) decision-makers.

11 See Chapter 3 (section 'Design')

Table 13.2 summarises the main findings of this section. With respect to expert-stakeholder pTA, the distance to the (political) decision-making process is a crucial design characteristic. The cases strongly suggest positioning expert-stakeholder pTA at arm's length of the (political) decision-making process[12]. If this is not done, the pTA arrangement loses its elementary function of creating a creative analytical space. Normally, the pTA tries to escape the current (political) situation by looking at the future. This is supposed to allow participants to leave their fixed positions and views, and look for new sorts of solutions, problem perceptions and strategic alliances.

Amongst the expert-stakeholder pTA cases, some can be considered more expert-oriented and others more stakeholder-oriented. Typical of the more expert-oriented cases (such as Delphi AU and Novel Food NL) is that the end product is an outlook on the future. Related to this, the pTA aims at finding solutions. The more stakeholder-oriented pTAs (Gideon NL, Copenhagen Traffic DK) basically deal with finding common problem definitions. The orientation to the future helps to enable this process by creating a proverbial 'ideal speech situation'.

When selecting participants, organisers of expert-stakeholder pTA need to find a proper balance between content- and power-related qualities. Participants were selected who represented a broad variety of actors and views within the problem-setting, who were thought to be creative, and who were in a position to mediate the results of the pTA to their organisation.

Comparing Public pTA and Expert-stakeholder pTA

As has been shown, public pTA and expert-stakeholder pTA are used within different problem-settings. Public pTA has been used to stimulate public debate and inform politicians about the opinion of (informed) citizens in cases of new technological developments that lead to a critical public debate. Although antagonistic, the societal situation addressed was often not fixed. This contrasts with expert-stakeholder pTA that normally dealt with existing technological systems and related fixed societal situations. In the following, we compare the design characteristics of public and expert-stakeholder pTA (see Table 13.2).

12 Traffic Forum AU seems to indicate that in case of a direct pTA, organisers are bound to respect the rules of the related decision-making process with regards to participation, communication and problem framing. We would like to argue therefore that there is no such thing as a *direct* pTA. When a participatory process becomes an integral part of decision-making, it ceases to be a pTA and becomes a participatory policy-making process. Participatory policy processes and participatory TA processes are often wrongly grouped together (see Grin, 1998: 6).

Table 13.2 *Comparing Public pTA and Expert-Stakeholder pTA*

Public pTA	Expert-stakeholder pTA
Relation to decision-making	*Relation to decision-making*
Indirect	Indirect by putting future perspective on the pTA
Improvement of impact by: • Building up reputation	Improvement of impact by: • Involving people who can mediate the results to their organisation • Addressing the pTA to a powerful actor • Getting support from key players
Participation	*Participation*
Main selection criterion: • Lay people should represent a broad variety of views	Main selection criteria: • Participants should represent a broad variety of interests and ideas • Participants need to be creative • Participants need to be in the position to mediate the results to their organisation
Issue of representation may be dealt with by the use of survey techniques	Issue of representation may be dealt with by involving key players in the selection process
Interaction	*Interaction*
Various types of roles of lay people versus experts and stakeholders: • Lay people getting informed by experts • Lay people questioning experts to form their opinion in order to advise decision-makers • Lay people and experts getting into dialogue • Lay people and experts as equal judges of proposed policy scenarios	Interaction amongst participants free from the strategic behaviour and unequal positions characteristic of real-life problem-setting. The creation of a protected analytic space is guided by the Habermasian notion of the 'ideal speech situation'
Problem framing	*Problem framing*
Participants have to get acquainted with the views and positions within the actual problem-setting	Participants have to get away from the fixed ideas and positions within the actual problem-setting
Treatment of the problem: • Synoptic treatment of problem scope • Elaborating treatment of complexity • Involved with problem finding	Treatment of the problem: • Within clearly set boundaries that agree with the objectives of the pTA • Within boundaries accepted by all participants
The written results of the pTA should always be approved by the participants	Translating the outcome of the future-oriented pTA into policy advice needs separate design step

Relation to (Political) Decision-making

One might say that a public pTA is indirectly linked to the (political) decision-making process by nature. It aims to support the representative democratic system by informing politicians about the various world views of the people they represent. The impact of a public pTA therefore crucially depends on the way decision-makers appreciate this type of information. In this respect, familiarity of parliamentarians with the method is crucial. The EUROPTA cases

often present first-time national experiences with public pTA. MPs' acquaintance with public pTA therefore is expected to be rather low, and building up a reputation takes a long-term effort of honest, serious and transparent experimentation.

Whereas public pTA normally deals with a problematic current debate, but an open future, the expert-stakeholder pTA deals with a fixed, often antagonistic, present situation that will – without any change – lead to an undesirable future. There is often a need felt within the problem-setting for change. At the same time, this setting prevents change that depends on joint action. In order to escape the current technological, institutional and cultural fixes, the expert-stakeholder pTA needs to exist at a safe distance from the decision-making process. In this way the pTA functions as a creative space; a laboratory to find new common alternatives. To escape the current power games, a future perspective is normally put on the pTA. Depending on whether the pTA is more oriented towards problem- or solution-finding, this 'transformation' has many repercussions for the design (see discussion below).

The more solution-oriented expert-stakeholder pTAs are aimed at creating joint forecasts of the future in the form of R&D plans or scenarios. In this case, the information produced within the pTA can easily be used by decision-makers. When the expert-stakeholder pTA is oriented towards problem-finding the direct usefulness of the pTA's results for decision-makers is much smaller. In this case, the pTA's aim is rather to strengthen the existing climate of change and to offer a 'temporary' platform to cultivate the existing seeds of change. Working out more ready-made policy advice seems to need a great deal of extra effort and a more permanent platform.

Participation

Lay people within public pTAs are selected to represent a broad variety of views. While organisers seldom claim that the pTA is representative for the whole population, the issue of representation is often raised by critics. It was found that this point of critique could well be addressed by using additional survey techniques.

As in public pTA, participants of an expert-stakeholder pTA need to stand for a large variety of views. Besides, participants are selected for their ability to leave beaten tracks. A selection criterion typical for expert-stakeholder pTA is the participants' capacity to mediate the results to the problem-setting.

Interaction

In public pTA, a crucial design criterion is how to shape the role of lay people versus experts and stakeholders. Several roles were found: lay people being informed by experts, lay people using experts as advisers, lay people and experts in dialogue, and lay people and experts both acting as judges of proposed policy scenarios.

The expert-stakeholder pTA shapes the interaction amongst experts and stakeholders. The organisers normally strive to create a protected analytic space in which each participant – in principle – has the same power position. In this way the outcome of the pTA is to be determined by argumentative power instead of political power.

Problem Framing

Whereas in public pTA participants have to be informed about the problem-setting, the participants of the expert-stakeholder pTA have to move away from the fixed ideas and positions within the actual problem-setting; in a sense they have to become de-informed.

A public pTA is often more involved with finding common problem definitions than with producing solid solutions. This resembles the problem-oriented expert-stakeholder pTA. In both cases, participants themselves, to a large extent, define the boundaries of the problem. In contrast, the solution-oriented expert-stakeholder tries to deliver a plan for the future. To come up with workable solutions, this type of pTA needs a more clear and narrow boundary of the problem.

Conclusions

In the analytical framework (Chapter 3) the rationale for pTA was introduced by posing a number of questions:

- What kind of problems are suitable for treatment through pTA?
- What determines the choice of method in pTA?
- When is it necessary or valuable to set up a pTA?

These questions will be addressed in the following in respect of the choice of method, and the relationship between design elements and decision-making, participation, interaction and problem framing.

As regards the first question, the choice of method for pTA is the search for a manageable and legitimate tool and a design for intervention in a problem-setting. Since pTA methods, by definition, involve people and therefore require people to be involved, these methods bear a price beyond the formal costs. This limits the applicability of pTA methods to situations seen to be of importance by the actors involved. Societal stakes have to be high enough in the eyes of all those involved. In the design of a pTA method, an important design criterion is whether the chosen form of pTA will be attracting the co-operation of those indispensable for its success.

PTA methods therefore should only be used in situations were the importance of the issue is clear to those involved. The type of situation (type B; see above) where a technology needs scrutiny in the eyes of some analysts or

policy watches, but where this is not recognised (yet), can in general be addressed better by more classical forms of TA. If one still thinks such issues warrant pTA because of the importance of the issue, an effort should be made to search for clear examples of the expected effects in order to draw in those to be involved in the issue.

New scientific or technological developments with uncertainties about effects, the values involved and norms to be applied, provide most examples of public pTA. Such situations are accompanied by relatively flexible social arrangements (relatively little vested interests) and high visibility on the public agenda. In these cases, involvement of a lay public seems indeed to be mostly legitimate, probably because of the uncertainty involved.

In relatively fixed situations of fully developed technological systems with high stakes involved we find relatively many examples of stakeholder TA.

The fact that public pTA and expert-stakeholder pTA are used to address different types of problem-settings has consequences for the design of the pTA. It is advisable to position both forms of pTA at arm's length of the (political) decision-making process in order to make clear that the pTA is rendering a service to decision-makers and is not trying to take over their job. In expert-stakeholder pTAs, putting a future perspective on the issue at stake normally achieves this aim.

Participants of both types of pTA are selected to represent a broad variety of views. With respect to expert-stakeholder pTA, extra requirements are set for participants, such as creativity and ability to mediate results. The issue of representation is relevant in both cases. In public pTA, this issue can be dealt with by using survey techniques. In expert-stakeholder pTA, it is often wise to use key players in the selection process.

Different public pTA designs can be distinguished on the basis of the roles lay people versus experts and stakeholders play within the arrangement. Central to most public pTAs is the transfer of knowledge from lay people to experts and/or vice versa. Expert-stakeholder pTA is not only about sharing knowledge, but also about creating new common knowledge. The more interactive nature of the expert-stakeholder pTA is guided by the Habermasian ideal of the 'ideal speech situation'.

Whereas in the case of public pTA participants have to be informed about the problem-setting, in expert-stakeholder pTA a huge effort has to be made to involve the actors away from the myths and truisms that dominate the problem-setting. Both public and expert-stakeholder pTA allow for a broad problem scope. Most pTAs are mainly involved with problem-finding. In these cases, the pTA seldom delivers ready-made advice for decision-makers. An extra, more permanent effort seems necessary to elaborate on the ideas generated within the pTA in order to make them practical.

Chapter 14

The Role of Participatory Technology Assessment in the Policy-making Process

Danielle Bütschi and Michael Nentwich

Introduction

In its essence, technology assessment (TA) has a strong political dimension. When the American Congress developed TA in the 1970s, it imagined a political tool that would give Members of Congress access to independent, objective and competent information on scientific and technological issues. Congressmen would thus be in a better position to appreciate legislative projects and able to base their political action on more viable alternatives. The concept of TA evolved further over the years, in particular in Europe. First, the addressees of TA studies were not always the legislators but increasingly also the bureaucracy and other levels of government. Second, while the American model was based on a rather scientific approach of the assessment (involving stakeholders only afterwards), European TA always struggled with how exactly to integrate interests and values in the assessment. One strand of European TA – mainly originating in Denmark – is trying to solve the problem of how to make values and interests fruitful by organising participatory procedures. With this 'participatory turn', the political dimension of TA is even stronger, as it is no more an academic activity whose outcomes are to be communicated to, and used by, policy-makers, but a political activity in itself. Integrating various actors is eminently political, as questions of power, influence and responsibility intervene.

The politicisation of TA activities by integrating participatory elements has its origins in the recognition that the State is under pressure. As discussed in the research framework (Chapter 2), new developments in science and technology put public authorities under pressure, as they are faced with *uncertainty* about the consequences of these developments and with a plurality of values and interests about them. In this sense, the development of participatory technology assessment (pTA) arrangements is a kind of response to the legitimacy crisis of the State. Also, from the viewpoint of *inequality*, the possi-

ble political contribution of pTA is to take into account the plurality of views and values present in society and to give them a voice.

The questions to be addressed in this chapter are: how do pTA arrangements perform in the policy process? And, what exactly is their answer to the legitimacy crisis of modern States? Aiming at integrating the analysis of scientific and technological developments into the societal debate, participatory processes face an ambitious task, while their role within the policy-making process[1] is rather complex. First, as a new instrument, pTA arrangements still have to prove to be worth the effort. Even then, the place they might find is far from obvious: pTA comes in addition to already highly complex political procedures and institutions that are, moreover, different from country to country. Therefore, pTA has to construct its role in each political system[2]. This becomes evident from the cases studied in the EUROPTA project. Most initiators wanted the pTA arrangements to influence the process of policy-making in some way, but with different goals and perspectives. However, the chances of a pTA arrangement having any political influence depend not only on the aims of the initiators, but also on the type of arrangement, the societal and the institutional context.

This chapter analyses both the types of roles in the process of policy-making that can be assigned to a pTA arrangement, and the factors that influence whether or not the pTA succeeds in having any political function. This is done in three steps: first, an inventory of possible political roles played by pTA arrangements is drawn up. Second, the political performance of the various arrangements is analysed. Third, the intervening factors influencing the actual political role as well as the relationship between these 'success factors' and the political aims of the pTA arrangements are discussed. The scope of this analysis focuses on the political role of pTA arrangements in the policy-making process in a narrow sense. Other actors, such as political parties, social movements and industry, may also be individually or collectively affected by pTA arrangements (social movements can, for example, gain legitimacy, an actor network can be restructured or replaced, etc.). Given the data gathered by the EUROPTA team, which analyses pTA mainly from the point of view of practitioners, political impacts that are not mainly directed towards the State[3] are only marginally considered.

1 By 'policy-making process' we understand here the various processes shaping a policy in a particular issue area (here mainly in science and technology policy).
2 The term 'political system' is used here in a rather general way, meaning the set of actors who are involved in dealing with a policy problem such as energy or telecommunications (see Chapter 3).
3 By the 'State' are meant the public authorities, including the state bureaucracy, government and parliament as opposed to the civil society including institutions representing special interests.

Description of Political Roles of pTA Arrangements: an Inventory

Generally speaking, pTA, as a special form of conducting TA, is an instrument to analyse technological developments and related policy options. In allowing many actors to intervene in this analysis, a common ground is created with a view to address the questions of risks and chances and to confront the different values. PTA is not bound to any specific phase of the policy-making process and hence its political role is potentially manifold. Studying the EUROPTA cases reveals that the organisers of the pTA arrangements had different objectives in mind. It should be noted, however, that only openly or explicitly stated objectives can be considered here, as additional information about implicit, or hidden, agendas is only rarely available. Furthermore, we can see that the actual role of a pTA arrangement is not always the one expected or is not fulfilled in every respect (point (3), page 239). Having the evidence of some 16 case studies of six countries with a broad range of subjects should help to reveal the main political roles.

Before presenting the various possible political roles found in our case studies, it should be noted that the following categories have been drawn up for analytical purposes only. In reality, most arrangements are intended to, or actually, play a mix of different roles. If a case is mentioned in only one or two of the following ideal-typical categories, this would not mean that it plays exclusively the political roles falling within these categories, but that they can be regarded as being the most typical example in that category.

(1) pTA with at best indirect political role

To begin with, and despite the main European conception of TA as an instrument for policy advice, it should be acknowledged that some pTA arrangements do not seek any (direct) political role at all, at least if we define the 'political' rather narrowly as we do in this chapter. Four types of only vague or indirect political aims could be identified. First, the Plant Biotech UK consensus conference was mainly intended to contribute to the public understanding of science, even though the Science Museum (one of the two initiators) tried to establish stronger political links[4]. In more general terms, we may coin this role as *promoting communication between science and the public*. Already in the beginning, the Biotechnology and Biology Sciences Research Council (BBSRC), which funded this consensus conference, stated that it would not change its policy on plant biotechnology as a result of the conference report. Accordingly, politicians and civil servants did not show strong political interest and/or commitment in the event.

Second, the GM Animals NL debate mainly aimed at *stimulating public debate*. Of course, organisers also had political aims (see below), but their focus was, by allowing an open dialogue between experts and non-experts

4 Public understanding of science can also be understood as a political role, since it is an official government policy in the UK (see Part III, Chapter 10).

and spreading information, to stimulate and enlarge public debate on genetically modified animals[5]. This seems also to be the case with the Sustainable Menu NL debates.

Third, the (nevertheless) 'political' target of the arrangement is not the decision-making process itself but rather the attainment of political or societal goals indirectly via *awareness building*. The Novel Foods NL conference is a case in point, which was based on the idea that changes towards a sustainable development could not be brought by direct governmental attempts at steering technology, but as the result of a variety of actors adopting new options and alternatives. Consequently, this conference did not aim at influencing technology policy(-making), but at exemplifying the feasibility and the paths towards a sustainable development.

Other pTA arrangements described in the case studies clearly share similar aims with these examples. In particular, many arrangements seek to build bridges between science and society and to raise interest among the broader public. But these aims are coupled with other, more explicitly political aims (for example, both the PubliForum on Electricity CH and the citizens' forum Biotech Baden-W. GE aimed at fostering public debate next to their direct political objectives, see below).

Other examples show that other 'indirect' roles can be considered, even though they have not been clearly stated by the organisers. A rather implicit role was that, in some cases, the arrangement should *raise sensitivity for the pTA method*, such as in Plant Biotech UK, Citizen GMO UK and Electricity CH. This kind of role can be treated as a further (indirect) political role since these changed perceptions may eventually have an impact on how the discourse about the policy-making on scientific and technological is shaped in the future. In a sense, the introduction and eventual widespread use of pTA can be said to be an 'indicator' for a changing political climate.

The majority of the case studies examined within the EUROPTA project were designed to target the political decision-making process directly. Obviously, the pTA arrangements differ not only with respect to their structure and procedure but also in their design to impact on the political decision-making process at different points and in different forms. The following direct political aims could be identified:[6]

(2) pTA as agenda-setter

The legitimacy and management crisis of the State may often have its origins in the inability or unwillingness of its representatives to recognise or acknowledge a problem. Traditionally, NGOs or citizen action groups are trying to

5 This focus is mirrored by the title of the arrangement itself ('Public debate on genetic modifications of animals').

6 Note that in the following, particular case studies are mentioned only in order to exemplify the following categories; the examples given are not intended to be an exhaustive classification of all the case studies; one of the reasons for this is that information about the (sometimes hidden) aims is not exhaustive and another is that a few case studies would fall into more than one category.

put an issue on the political agenda and, hence, pressure on the governments to consider these neglected problems or issues. The media often play an important role in multiplying the voices of the NGOs. In countries with a tradition of direct democracy, new issues can also be raised through popular initiatives (there was, for example, in Switzerland an initiative on genetic engineering). Arguably, pTA arrangements can have similar goals. By inviting several actors to discuss an issue and giving publicity and transparency to these discussions, the initiators of a pTA arrangement aim at putting issues on the political agenda. Such a pTA arrangement thus tries to identify all aspects related to the issue. The scenario workshop Urban Ecology DK can be described as the paradigmatic example of an 'agenda-setter pTA arrangement' aiming at putting the issue of the barriers and solutions to the implementation of the (already politically known and decided) sustainability aim on the political agenda. It succeeded in catching the attention of decision-makers on this topic. Also the Ozone AU consensus conference had a similar goal. It was, however, more part of a political game between some *Länder* which launched the pTA and the federal government: the issue of ozone was already recognised as a major issue, but the *Länder* wanted to force the hesitant federal ministry to launch a broad political debate on the issue, thus instrumentalising the arrangement.

(3) pTA as exploration of objectives

The plurality of values in modern societies implies that discussions about new technological and scientific developments are characterised by the presence of different and often conflicting preferences and values. PTA arrangements may be considered a platform of dialogue and exploration between different conceptions. In doing this, pTA arrangements set up a creative space. Their function then is to clarify the different preferences and values as well as to develop proposals for normative judgements on a problem or an issue. In this sense, such pTA arrangements are intended to deliver advice for the preparation of a decision by helping to define the objectives. The case of the Citizen GMO UK and the Gene Dialogue CH aimed at giving advice on the general objectives. In integrating lay persons in an early discussion on the new developments in this field, the organisers and associated institutions wanted to give advice on hopes and fears present in society with a view to guide future decisions. The PubliForum Electricity CH had a similar goal: even though the theme of electricity had been discussed for a long time in Switzerland, the country experienced the end of a 10-year 'truce' and many signals indicated the emergence of a new energy policy. In this situation, the PubliForum aimed at indicating paths for this future policy. Similarly, the future search workshop Copenhagen Traffic DK intended to create common visions of future scenarios for traffic in this big city. The citizens' forum Biotech Baden-W. GE aimed at exploring benefits and risks and public acceptance from the perspective of lay persons. Another explorative enterprise was the first phase of the Delphi AU, where experts generated alternative visions of the future of their fields.

Gideon NL is a final example of this category. In this case, the aim was to find solutions and enable the Members of Parliament to evaluate the current policy in the light of these findings.

(4) pTA as filter of policy alternatives

The political process might also be, in some cases, more advanced, but still in need of dialogue procedures. If several options or alternatives are considered, pTA arrangements can offer advice on the alternative to choose. The voting conference Drinking Water DK had the goal of putting in perspective different options with a view to contribute to the Parliament's legislative procedure. The citizens' forum Biotech Baden-W. GE aimed at filtering those alternative applications that would be acceptable to the general public. In the case of the Delphi AU, while the participatory process with expert groups generated alternative visions of the future technological developments, the Delphi survey itself should be a means of assessing these alternatives and, hence, reducing them.

(5) pTA as 'blockade-runner'

It often happens that the policy-making process is blocked – be it in the phase of the definition of objectives or of alternatives – with the consequence that no further steps can be taken. Some pTA arrangements were indeed designed in such a context. More precisely, no further steps could be undertaken because of unsolved conflicts between the concerned actors. Consequently, these arrangements had the objective to contribute to the management of this political conflict. The Traffic Forum AU is one example of an arrangement in which participation is seen as an alternative form of political dispute resolution. In a slightly different sense, the future search Copenhagen Traffic DK was also intended to overcome stalemate: here, the innovation system had developed into not being innovative at all. In this situation, the arrangement tried to reopen the system in order to admit reshaping of the technology.

(6) pTA as implementer and evaluator

Implementation and evaluation are still other phases of the policy process and we can find some cases of pTA intervening at this stage. First, even though the public debate GM Animals NL aimed at advising politicians on GM animals with a view to law-making, the arrangement had more the role of testing whether the ideas of the public were in line with the ideas of the politicians as the law had actually been enacted a few months before the conference[7]. It turned out that ideas of the public were in line with those of politicians, as both the law and the lay panel report pleaded for a restrictive use of genetic animals. In that sense the debate strengthened the existing policy. Policy evaluation is a genuine political role since if the result had been that the public had other views on the topic, this might have led to agenda-setting. Second, the

7 The speed of the decision was unintended for the organisers and shows how timing can be tricky.

Novel Food NL sessions focused on implementing the idea of sustainability, e.g. by influencing the priorities of funding institutions – again a clear political act. Third, even though it had not been clearly stated, the initiators of the Biotech Baden-W. GE hoped that the outcome of the arrangement would endorse the rather liberal, market-oriented policy of the regional government. But these hopes had not been fulfilled, as the report was rather critical of biotechnology.

This latter example shows that aiming at implementing or evaluating a policy can be rather tricky. The author of the case study pointed out that the implementers showed a tendency to 'instrumentalise' the pTA arrangement in the direction of promoting acceptance of biotechnology. Of course, such instrumentalisation can also occur when the aim is to explore objectives or to foster public debate, but the risk of such bias seems to be higher in the case of implementation and evaluation of policies[8].

Table 14.1 *Possible Political Roles of pTA Arrangements*

Possible political roles		Examples
(1) Indirect political role	a. promoting communication between science and the public	Plant Biotech UK
	b. stimulating public debate	GM Animals NL Sustainable Menu NL
	c. awareness building	Novel Food NL
	d. raising sensitivity for method	Plant Biotech UK Electricity CH Citizen GMO UK
(2) Agenda-setter		Ozone AU Urban Ecology DK
(3) Exploration of objectives		Electricity CH Gene Dialogue CH Copenhagen Traffic DK Biotech Baden-W. GE Delphi AU Gideon NL Citizen GMO UK
(4) Filter of policy alternatives		Biotech Baden-W. GE Drinking Water DK Delphi AU
(5) 'Blockade-runner'		Traffic Forum AU Copenhagen Traffic DK
(6) Implementation and evaluation of policies		Novel Food NL GM Animals NL Biotech Baden-W. GE

8 In this respect, pTA implementers looking for such a role should be open to redefine the policy in question if the outcome happens to be in contradiction to the existing policy. Otherwise, they will automatically face critics of instrumentalisation, as did the organisers of the Biotech Baden-W. GE.

Table 14.1 summarises the foregoing analysis by making an inventory of the various political roles of pTA arrangements and attributing our case studies to them. Note that, as regards items (2) to (6) in particular, the list reflects in which stage of the policy development the issue at stake is placed: starting with putting the issue on the agenda, two phases during the policy definition phase are covered (exploring objectives and filtering policy alternatives); other possible stages where pTA may intend to play a role are cases in which policy-making is blocked or in the implementation and/or evaluation phase.

The EUROPTA research framework came – in a top-down approach – to the conclusion that pTA has a double role in, on the one hand, providing a playground for deliberation and exploration and as a means of social learning and, on the other, in aiming at improving (and thus, implicitly, influencing) decision-making in a cognitive, normative and pragmatic dimension. Our bottom-up view, based on the evidence of the case studies, mirrors these two roles and therefore supports these general reflections: while what is called here 'indirect political role' (Table 14.1, points 1a–d) may be seen as part of the 'social learning' component of pTA, the direct political roles in the various policy-making phases (Table 14.2, points 2–6) reflect the other side of pTA.

Political Performance of pTA

Before discussing the intervening factors influencing the actual political role, the case studies are analysed here in terms of how they perform in practice. Were the various expectations met and how? We are entering here the tricky area of impact research. The manifold difficulties of such ex-post assessments will be returned to below (see also Chapter 15), but the following twofold caveat should be made here: first, due to the dynamics of politics, it is very difficult to distinguish between effects directly related to the pTA arrangement and those which have other direct causes. Second, in-depth analysis of the effects has been undertaken very rarely. Consequently, only few empirical data are available.

In a first step, the types of political roles defined above (on the basis of the aims of the pTA arrangements, as described in the case studies) were analysed in terms of whether they match with reality. This shows that all our case studies concluded that the arrangements played, in one way or another, a political role. Even arrangements without specific political aims have led to some discussion in the political arena. Note, however, that the political performance, i.e. the attainment of the envisaged political roles, of a majority was rather weak (see below).

In a second step, an attempt was made to specify to which extent the expected role was achieved, making a distinction between a weak, moderate and strong role. As no precise measures of impacts are available, it can be difficult – and somewhat subjective – to state with certainty whether a pTA arrangement had a weak, moderate or strong political influence on the policy-making process. Moreover, as various political aims could be observed, the

Table 14.2 *Criteria to Assess the Actual Political Role of a pTA Arrangement*

Political role	Weak	Moderate	Strong
(1) *a. promoting communication between science and the public*	Some communication took place	A wider communication process was established	The public and/or scientists learned something about the others
b. awareness building	Arrangement was taken notice of by the public	Results were discussed in public	Arrangement led to changes in attitudes and behaviour
c. stimulating public debate	Arrangement was briefly mentioned in the media	Arrangement was extensively mentioned in the media	Arrangement led to further events
d. raising sensitivity for the method	Arrangement was taken notice of by public/politics/media	Method was discussed	PTA was integrated in policy-making
(2) *Agenda-setter*	Arrangement was taken notice of by politicians	Issue addressed reached the political agenda	Arrangement is considered ex-post a milestone
(3) *Exploration of objectives*	Arrangement was taken notice of by politicians	Results were discussed in the political arena	Results were integrated in the policy-making
(4) *Filter of policy alternatives*	Arrangement was taken notice of by politicians	Results were discussed in the political arena	Results were integrated in the policy-making
(5) *'Blockade-runner'*	First steps towards breaking up the stalemate taken	Co-operation is again possible or stalemate is broken up	a final solution to the conflict was found or the system is being reshaped
(6) *Implementation and evaluation of policies*	Results were discussed	Changed attitudes in the respective field	Was a major contribution to the implementation/ evaluation

extent to which they have been met should be assessed accordingly. Table 14.2 defines the characteristics of the three degrees for each of the political roles of pTA arrangements.

As a general feature, a pTA arrangement has a 'weak role' when the overall assessment of the case indicates that the actors involved in the respective policy-making process were informed about the process, but did not explicitly react. In such a case, we cannot exclude that the arrangement implicitly influenced the policy-making process. A pTA arrangement is considered to have a 'moderate' influence, when the case study shows that the arrangement led to some political discussions. Finally, a pTA arrangement can be said to have a 'strong' influence if politics could not ignore it and if it led, for instance, to a concrete decision. Table 14.2 shows the operationalisation regarding the various roles.

Considering the case studies using Table 14.2, it becomes apparent that the expected political role is almost never completely fulfilled. Many factors can intervene, as will be discussed in the next section. Nevertheless, some arrangements happen to be more successful than others, and these may be seen as examples of good practice. One quite successful pTA arrangement seems to have been the voting conference Drinking Water DK as Parliament considered its results to take a decision on the issue. The scenario workshop Urban Ecology DK was also successful in putting this issue high on the political agenda. The arrangement in Gideon NL turned out to be a way for a minority proposal to get approved. This proposal was then not new in the debate, but as it has been endorsed by a wide variety of actors participating in the arrangement, its legitimacy was enhanced in the Minister's eyes and could be transformed into a concrete policy measure[9]. The project also seems to have played the role of 'enlightenment' in the policy process: as a result of the Gideon NL project, the Minister, in public, established a relationship between the objective of pesticide reduction and preventing plagues and diseases (which was something new). The PubliForum Electricity CH can also be counted amongst the success stories: even though its influence on the issue remained limited, public authorities considered the method as a meaningful tool to be implemented in science and technology policy-making.

Still, a large proportion of cases had only a weak or moderate political role. But this assessment is certainly relative in time. For example, in the UK, a government minister recently released a statement saying that there should be wider public consultation on science and technology issues, such as in the form of consensus conferences (note that the consensus conference on Plant Biotech UK took place as early as 1994). That came after another government minister, in 1997, recommended carrying out consensus conferences, and a Royal Commission suggested using consensus conferences more permanently, too (see Chapter 10). So, our assessment with regard to the case of Plant Biotech UK may shift in the longer run.

Moreover, even though the political impact remains small, case studies show some influence on the policy-making process. For example, the Citizen GMO UK arrangement resulted in the Environment Minister inviting the lay and stakeholder panels to a meeting at the Ministry to discuss their findings. Both the Electricity CH and the Gene Dialogue CH arrangements have been presented to Members of the Parliament. The Delphi AU has also been considered by the Minister and seemed to have influenced his political agenda. Moreover, it served to attach higher legitimacy to the later decisions taken by the Ministry since it was handy to point at the results of this study, which were based on the involvement of a large proportion of the relevant expert and stakeholder community. However, in an overall assessment, the impact of this arrangement was only moderate since it covered a variety of subject areas (from high technology to organically grown food) and had almost no follow-up in some of these.

9 As is discussed in Chapter 15, it is difficult to trace how much the pTA arrangement influenced the decision. At best, we can say that it contributed to it.

Table 14.3 *Ex-post Assessment of the Political Role of pTA Arrangements*

		Weak	Moderate	Strong
(1)	*a. promoting communication between science and the public*	Electricity CH	Plant Biotech UK	
	b. *awareness building*		Novel Food NL	
	c. *stimulating public debate*	GM Animals NL	Sustainable Menu NL	
	d. *raising sensitivity for method*	GM Animals NL Biotech Baden-W. GE	Plant Biotech UK Citizen GMO UK	Electricity CH
(2)	*Agenda-setter*	Ozone AU		Urban Ecology DK
(3)	*Exploration of objectives*	Citizen GMO UK	Copenhagen Traffic DK Electricity CH Gene Dialogue CH Delphi AU	Gideon NL
(4)	*Filter of policy alternatives*	Biotech Baden-W. GE	Delphi AU	Drinking Water DK
(5)	*'Blockade-runner'*		Traffic Forum AU Copenhagen Traffic DK	
(6)	*Implementation and evaluation of policies*	Biotech Baden-W. GE	Novel Food NL GM Animals NL	

The reasons for this varying political impact are manifold, as will be discussed further. Table 14.3 summarises the findings so far.

It should be pointed out that it is only in rare cases that a pTA arrangement will produce a new and original solution or option to an issue. Very often, participants in a pTA arrangement do not 'create' new ways of considering an issue or new policy measures, but gain inspiration from the deliberative process. In this respect – and the case studies confirm this – the way pTA will influence the policy-making process can be both innovative and legitimising: innovative in the sense that it can bring new ways of considering an issue (Urban Ecology DK); and legitimising in the sense it can make a proposal socially and politically acceptable (Gideon NL).

Factors Influencing the Political Role of pTA Arrangements

So far, the role of pTA arrangements within the policy-making process has been considered without discussing what factors or elements contributed to their 'success' or to their 'failure'. What follows addresses questions, such as why it is that the Urban Ecology DK was quite a success, whereas the Ozone AU can be described as a failure with regard to its actual political role. To understand fully the role of pTA arrangements in the decision-making process and to learn something about possible future(s) of pTA, the intervening factors that ensure that an arrangement plays its intended political role should be

considered. Referring back to the EUROPTA analytical framework (see Chapter 3), the starting point is that these factors can be related to the societal context, the institutional setting, and the properties of the arrangement itself (a–c, below). Using direct evidence from the various case studies, an attempt is made to identify which factors are most relevant for which political roles.

a) Societal Context

Three important factors can be identified under the heading of 'societal context':[10]

1 timing and public controversy;
2 the political relevance of the topic; and
3 structural properties of the political system.

(1) Timing: pTA arrangements are, in general, not a formal part of the policy-making process, but a policy analysis instrument aiming at feeding the process with new perspectives. A need for such advice must exist: more specifically, as an instrument that is meant to integrate in the same process uncertainties and conflicting values, there must be a social debate or a political debate that puts policy-makers under pressure. In other words, the timing of a pTA arrangement is of relevance. Put simply, this means that a pTA arrangement has to be set at the right moment. But what is the right moment? One may argue that it is linked to the phase in the development of the technology, or that the major factor to look at is whether the issue is socially debated or that the main aspect to consider is the stage of the political debate (thus privileging the policy-making process). Looking at the case studies suggests, however, that the answer might not be so simple. There seems to be no one right moment, but a number of different right moments. According to the phase one is in, the right method with the appropriate aims should be chosen, as the following will show.

First, contrary to the idea that the political role of pTA might depend on the phase in the development of the technology considered, our analysis did not find such an influence. Of course, when setting up a pTA arrangement, one has to choose carefully the appropriate methods and goals according to the phase of the technological development, but this does not affect directly the political role that is aimed at or achieved[11]. Rather, it is the phase of the policy process that is of crucial importance. For example, if a new technology is in an early phase of its development, it will require a specific kind of political decision (e.g. whether to fund research and development) and this has to

10 According to the terminology we use in the research framework (Part II), 'society' includes both the societal debates and the political system.
11 To give an example: if a technology is in a rather early stage of its development, it would not make sense to arrange a pTA filtering policy alternatives if policy objectives have not been explored yet. In this sense, one could not expect the arrangement to have a political impact.

be considered. Similarly, when a technology is fairly advanced and agreed on, the political discussion might concentrate on possible measures to implement so as to avoid side effects, which, again, has to be considered when setting up the pTA arrangement.

Second – and logically following this first set of observations – timing with the political process is an important factor for the success of a pTA arrangement. The Gideon NL project, for example, had perfect timing as it had been planned in order to feed the debate in Parliament about crop protection. In contrast, the arrangements of Biotech Baden-W. GE and GM Animals NL had very bad timing with respect to the political process, as in both cases a law on the considered issue had already been enacted at the time the project took place (in the latter case, this could not have been anticipated by the organisers when they decided to launch the project).

Third, whereas political timing is of crucial relevance for the success of pTA arrangements, social timing must often simultaneously be considered. Especially when involving lay persons, a pTA arrangement must be in tune with the stage of both the social debate and the political debate. The example of Electricity CH shows that timing with the political debate alone is not sufficient to contribute to the policy-making process if the aim is to integrate lay assessment in the policy-making process. While the issue addressed in the arrangement was hotly discussed in Parliament and with concerned actors, the social debate on energy was, in a sense, 'sleeping'. The energy issue was still being discussed, but the debate was much less heated than it had been during the 1970s and 1980s (at that time, Swiss citizens had had to vote on many popular initiatives dealing with nuclear energy). At the time of the PubliForum, the media and the public had their eyes mainly turned in the direction of gene technology. Therefore, even though the 10-year 'truce' was coming to an end, it seems that policy-makers did not have the impression that they should listen to the 'people's voice', or more generally, that they would have to involve more people. This does not mean that no participatory arrangement should be undertaken in such a situation. But maybe, in this case, the timing was not ideal to involve lay persons. It would have been worthwhile to involve concerned actors such as NGOs and energy producers. Such a strategy was, for example, successfully chosen in the case of Gideon NL.

On the opposite side, GM Animals NL is an example where the mere existence or stimulation of a public debate might not be sufficient to guarantee that a pTA arrangement involving lay assessment plays a political role. In this case, the goal was to encourage public debate and the project was successful in some respects in attaining this goal. But apart from raising sensitivity for the method, the arrangement could not have any major political impact since an important political decision had been made just before the pTA. By contrast to these examples, the arrangements Urban Ecology DK and Drinking Water DK – which both involved lay assessment – have been organised at the right time with respect to the policy-making process and the societal debate. In the latter case, Parliament was indeed preparing a law on this issue and public opinion was hotly debating it.

In conclusion, good timing with public debate is necessary if the aim of the pTA is to influence directly the policy process, as lay participation often seems only acceptable to politicians in times of heightened public debate.

Timing with both public and political debate is, however, not a necessary condition in every case. As the Gideon Project NL shows, when a pTA arrangement only involves stakeholders, the fact that there is not a public turmoil about an issue does not really matter. This seems independent from the intended political role of the pTA arrangement (in the Gideon project NL, the arrangement had the function of exploring objectives). However, even though there is no evidence to prove it, timing with the public debate might not be so crucial when an arrangement aims at de-blocking stalemates or implementing policies. In these cases, the pTA has inherent political purposes, independent of the social debate (in some cases, the blockades can of course be accompanied by public discontent).

Finally, some arrangements benefited from a general climate demanding for more participation. This was, for example, the case with respect to the PubliForum Electricity CH. This arrangement occurred during a political campaign on gene technology: during this campaign, many voices claimed more dialogue between science and society and the PubliForum was thus considered as a model for such dialogue. It was then a perfect time to raise sensitivity for the method.

In summary, good timing with social and public debate seems crucial for the perception as a valuable input for political decision-making. But from the analysis of our cases, it remains difficult to pinpoint the right moment to have a pTA arrangement with respect to public and political debate. To answer this question, one certainly needs some experience in dealing with the political process and some insights about the way the issue is discussed in public. What can be said for sure is that, if the policy process is already well advanced, it might be difficult for a pTA arrangement to influence the policy process. Then, pTA may at its best legitimise an existing policy[12]. In fact, according to the phase of the policy-making process, the right aims of the pTA arrangement must be set: if it is far ahead of the policy-making, it should, for example, aim at exploring objectives. With respect to public debate, the issue of timing also sheds light on the relationship between the type of public controversy about the subject matter: if the arrangement takes place when controversy is low, pTA may play a role in initiating a broader debate, bringing the issue to the attention of opinion leaders and putting the issue on the agenda or moving it up in the list of priorities. If public controversy is high, pTA may play its role in facilitating and moderating this process of controversy.

Finally, in many cases unintended events helped the implementers of the pTA arrangement to be successful or, conversely, actually prevented them from achieving their goal(s). In other words, timing is something that one

12 An existing policy can of course be influenced by a pTA arrangement. But in this case, the policy process should, in some way, be (re-)opened for such inputs.

cannot entirely control. For example, it had not been foreseen by the organisers of the public debate GM Animals NL that the Parliament would not wait for the conference to finish before taking a decision on the issue. The organisers of the PubliForum Electricity CH had more luck: in their case, the unexpected claims for dialogue between science and society raised the attentiveness for the experiment.

(2) Political relevance of the topic: Beyond timing with the policy process as just discussed, there are other subject-related factors that come into play in order to enhance political relevance of the pTA arrangement. There should be a problem that politicians think should be *solved*. For politicians to feel inclined to act, there needs to be a group of people who would be affected positively or negatively by the topic. Or, the subject has to be associated with socially important movements in the economy, with regard to the infrastructure or the social development of a country. Obviously, politicians are not interested in all kinds of issues, but only in those that 'sell' in the political marketplace. This was the case in the Drinking Water DK conference, as there was growing discontent with water quality in Denmark. Something had to be done and politicians seem to have been very attentive to any project concerning this issue. Similarly, Urban Ecology DK addressed an issue which was of special relevance for the new Ministry of Environment; whereas the arrangement was hardly noticed by politicians, it took on much more resonance when the new Minister had been appointed. He had selected urban ecology as a field in which to raise his own profile and immediately asked for implementation of the project results. This latter example shows that, as with timing, political relevance is something uncertain which cannot always be anticipated.

(3) Structural properties of the political system: Since political structures cannot be altered or amended at discretion, any element of policy-making support, such as a pTA arrangement, has to be in tune with the structural properties of the given political system. The questions are: To what extent? How much tuning is necessary? Putting those cases aside that did not even attempt to have any direct impact on policy, it can be concluded that a certain degree of compatibility between method and political system is indeed necessary (see also Chapter 11).

First, there seems to be a positive relationship between, on the one hand, a *political culture open for participation* and with a tradition of less formalised deliberation and informal procedures and, on the other, the actual role to be played by pTA. It is probably not by chance that we find two of the Danish case studies in the column for 'strong political role' (Urban Ecology DK, Drinking Water DK). Note that we are not talking about the classical consensus conference model here but about new models, even in the Danish context. Even if one takes into account the experience of the Danish Board of Technology in organising such events, we also need to take into account the Danish political climate, which seems to be more open to public debate than in other countries. In this context, it does not come as a surprise that the first

consensus conference in Austria (Ozone AU) was a failure, since there is a rather non-participatory culture (referendums and popular initiatives as well as participatory administrative procedures are the rare exceptions to the rule of representative politics). And the same is also the case in the UK.

Note, however, that a general participatory culture seems in no way sufficient a condition for a high rate of political impact, as in the case of Switzerland. Other intervening factors also have to be taken into consideration (as described elsewhere in this section). Furthermore, one might argue that the fact that a political system features highly formalised participatory elements, such as in a system with sophisticated and well-established direct-democratic elements, may even work against the introduction and, hence, a political role of new, non-traditional participatory elements. Organisers of the PubliForum Electricity CH, for example, had to face scepticism from people fearing that (representative) direct democracy would be replaced by (non-representative) pTA. Based on the Swiss example, we may therefore state more precisely that pTA is more successful in a political system with a tradition of *lively and vibrant civil society*. But this does not mean that pTA is not worth trying in less participatory political systems it might only take more time to prove its value. Nevertheless, in countries where public participation is accepted – as in Switzerland – this effort might take less time than in countries which do not have such a tradition of empowering the people[13].

Second, the case studies do not show any significant correlation between politically successful or unsuccessful pTA and a national corporatist culture. In fact, most of the countries considered in the EUROPTA project can be labelled as corporatist, except the UK. But the pTA arrangements held in the UK faced similar problems with respect to their political role as those arrangements held in the corporatist countries. And if pTA seems to be successful in the corporatist Denmark, the pattern is the opposite for Austria – the archetypal corporatist system. There seems, however, to be an impact on the type and design of the arrangement: in corporatist cultures, pTA might be more successful when taking account of the particular way of dealing with highly organised interests. In the Austrian cases, for example, the relative failure of two of the arrangements (Ozone AU, Traffic Forum AU) to have any substantial political impact seems at least partly due to this neglect of corporatist structures.

In conclusion, the available evidence does not clearly settle the issue of whether there is a necessity for a close match or fit of the pTA method applied and the political system in which the arrangement takes place. There are, however, hints in the EUROPTA data that systems already open for informal participation are more likely to accept pTA and, hence, give it a political role. The alternative hypothesis that performing pTA may actually have an impact on the political system or culture itself (and not only on particular issues) could not be confirmed, but it may well be that there is not yet enough long-

13 We know that the Swiss TA Programme did not face this kind of criticism when organising its second PubliForum, whereas other countries, such as Austria, are still resistant to pTA – at least when involving lay people – even though experiments have already taken place.

term experience of applying well-established pTA methods in different settings (see Chapter 11).

b) The Institutional Setting

Here, the following two issues are analysed:

1 the link to the political sphere of the pTA and/or the institution organising the arrangement; and
2 the issue of credibility of both the institution and the process.

(1) The link to the political sphere: The link of the TA institution and/or of the pTA arrangement with the decision-making process is an important factor to look at. It is easier for organisers to meet their goals with respect to the political role if they are part of an ongoing political process – or at least when they are near the policy-making process. Being too close to the policy-making process might, however, be counterproductive, as the arrangement would face problems of legitimacy. In the case of the Delphi AU, the pTA arrangement had been initiated and commissioned by the competent Minister and he sent representatives of the relevant sub-units of his department to the working parties within the pTA arrangement – thus, the Delphi project had quite a strong link with the policy-making process. It comes as no surprise that he considered this report when developing a policy, but we also find cases with a closer link to the policy-making sphere which were nevertheless unsuccessful (for example, the case of the Traffic Forum AU). In this arrangement, the fact that the vice-mayor of the city was involved in the participatory process was perceived as instrumentalising the arrangement for its own policy agenda. This example shows that having too strong a link to politics might be dangerous for the pTA arrangement.

The Danish Board of Technology seems to have a near optimal link to the political sphere: it regularly reports to Parliament and Parliament can ask it to organise hearings on specific issues, but it remains independent. All institutions setting up a pTA arrangement do not have, of course, such a link with Parliament, but this example shows the importance of direct contacts with the political world. If no such privileged link exists, it can for example be substituted by involving political actors in the process (see also below).[14] However, this link and/or involvement of political actors is not crucial for all types of political roles. When the outcomes of the pTA arrangement are not directly addressed to political actors (as in the case of the aim to enhance public debate), this link is not crucial, and political actors need not necessarily be involved. Political actors should rather be indirectly addressed by the arrangement, via the media, for example.

14 The best solution is to do both, as did the Danish Board of Technology in Drinking Water DK.

(2) The credibility of institution: In order to raise decision-makers' interest in a pTA arrangement, the credibility of the organising institution is certainly one of the most important factors, and possibly a necessary condition, in a pTA arrangement. In other words, the reputation and, hence, influence of a pTA arrangement is directly linked to the standing of the initiator. The Danish Board of Technology, for example, enjoys a high degree of credibility. It is considered serious and independent, and decision-makers are thus willing to listen to its advice. Consistency of its activities seems to be one additional ingredient for playing a successful political role. In turn, performing thoughtfully organised pTA may enhance the credibility of the organising institution, as was the case with the Dutch NOTA/Rathenau Institute.

Whatever the aim is of the pTA arrangement (be it to launch a public debate, to raise awareness, to put an issue on the agenda, to give advice to decision-makers, etc.), it is of crucial importance that the organising institution appears as competent and independent. To meet this condition might, however, be problematic for recently created or *ad hoc* institutions. In these cases, the institution cannot rely on an existing reputation, but must create its credibility parallel to the realisation of the pTA arrangement. For example, the *ad hoc* organisation must consist of all relevant actors. If this is not possible for any reason (in the case of the Gene Dialogue CH, for example, organisers could not get some critical organisations), the problem should not be hidden and the organisers should adapt their aims and method to this situation (the organisers of the Gene Dialogue CH, for example, stated that the arrangement should give advice to the institutions financing the project on how citizens think about gene dialogue).

c) Properties of the pTA Arrangement

The *de facto* role of a pTA arrangement within the decision-making process depends also on:

1 the goal definition;
2 the process itself;
3 its product; and
4 the involvement of political actors.

(1) The goal definition: To play any significant political role, it seems that organisers clearly defining what they want to achieve, both for external communication purposes and for design purposes, will have a greater chance to be successful. When such goals are not formulated precisely enough, as in the case of Sustainable Menu NL (it was only said that the arrangement should 'enhance public debate'), it is difficult to design the process around these goals. Consequently, the decision-makers, who should eventually get involved and be influenced by the process, find it difficult to figure out if it is worth the effort. In this Dutch case, the vagueness of the objectives

contributed decisively to the political failure, although the institutional setting was otherwise optimal insofar as the pTA organisers acted on behalf of the government. Similarly, when many actors have a leading role in the pTA arrangement, it may lead to a confusion of goals, with each actor having its own goals. In the case of the Citizen GMO UK, for example, the funding organisation (a NGO) hoped to get a picture of the public opinion about GMOs, whereas the person in charge of realising the project was mostly interested in fostering a new method for discussing science and technology issues. This, of course, raised confusion about the aims of the project.

It appears that the goal definition is particularly important when the pTA arrangement is directed towards specific kinds of actors. If the pTA arrangement is meant to advise decision-makers (i.e. the roles agenda-setting, exploration of objectives and filter of alternatives) or help building awareness of an issue, it is important that this goal is clearly stated so that the addressees know that they are the target of the arrangement and get information on how to treat its output.

(2) The quality of the process: It seems essential that the pTA process is considered fair and competent by the observers. Otherwise, the whole process is not legitimate enough to play a role in the political arena (see also the discussion of discourse ethics in Chapter 12). For example, in the case of Traffic Forum AU both the mediators and one of the key politicians (the vice-mayor) were criticised for not being neutral and promoting a personal agenda, and the initial presentation was not accepted. Many ways can be found to guarantee the quality of the process, which all have finally to do with good management (see Chapter 12). Interestingly, one can note that the organisers of those cases that we ranked as playing a strong role in their respective category – the Danish Board of Technology, the Rathenau Institute and the Swiss TA Programme – work with steering groups or advisory committees, which are in charge of securing the quality and neutrality of the whole process. These steering groups are very useful in helping the organisers in their work (they can, for example, help the organisers to find the experts, give input to the elaboration of a documentation, etc.), but they also act as control agents. In this respect, it seems essential that all the relevant actors dealing with the issue have the impression of being represented in these steering groups[15]. Other mechanisms can be developed to guarantee this 'control', such as hearings (Plant Biotech UK). And it is also clear from our cases that having such a steering group or advisory group is not sufficient to be successful.

(3) The quality of the product: When the output remains vague or too visionary, it is difficult to translate it into political action. In other words, the results of the process relate back to the credibility of the process itself. In the case of Ozone AU, for example, the poor quality of the outcome (only a rather thin consensus report with no proposals for action) seems to be directly related to

15 All actors cannot be formally represented, as steering groups must remain small.

the lack of any political role – although the institutional setting was certainly an even more important factor for the failure. Initially, involved politicians had guaranteed appropriate implementation of the conference's findings, but when the results did not meet their qualitative expectations, they distanced themselves from their previous statements and ignored the recommendations of the lay panel. Conciseness thus seems to be vital for success. When the arrangement aims at having a role in the choice of alternatives, results must show some practicability, i.e. they must present viable problem solutions. In the example of the Biotech Baden-W. GE, the implementers wrote a report summarising the results of the many citizens' forums that were part of the project. However, their recommendations appeared to be too cautious for the politicians to start anything with them. From these examples, we can see that it is important that the addressees of the arrangement understand the output and are able to make something out of it. This is especially important when the arrangement aims at awareness building, agenda-setting, exploration of objectives and filter of alternatives, as, in these cases, the outcome is addressed to specific actors.

(4) Involvement of political actors in the process: The link to the political sphere not only plays a role at the level of the institution (see above), but also at the process level: if the pTA process itself is somewhat isolated and only seeks influence by forwarding its findings to the political sphere afterwards, we may expect a smaller impact than if the political actors already play a substantive role during the arrangement. To take just two examples, in Delphi AU, representatives from the bureaucracies were part of the expert groups and thus deeply involved in various phases of the project, and in Copenhagen Traffic DK politicians and officials were also active participants. By contrast, it does not seem sufficient that politicians observe the arrangement from a distance or deliver a policy statement in the event only. The case of Electricity CH, for example, shows that even though the organisers tried to involve politicians at different stages and levels (most of them received an invitation to attend the PubliForum; one was sitting in the accompanying group preparing the conference; some addressed a speech in press conferences or at the opening session of the PubliForum; two intervened as experts), the more

Table 14.4 *Success Factors Influencing the Political Role of pTA Arrangements*

1	Societal context	• Good timing with public controversy • Good timing with de facto policy-making • Political relevance of the topic • Political culture open for (informal) participation
2	Institutional context	• Link to the political sphere • Credibility and reputation of the institution
3	Properties of the arrangement	• Precise definition of the political goals • Fairness of the process as perceived by the political observers • Product of the arrangement aiming at practical implementation • Involvement of political actors in the process

engaged advocates of the arrangements were those who were part of the process.

The factors influencing the political role of a pTA arrangement can be summarised as follows:

Conclusions

The debate about pTA often attributes to participation the role of helping decision-makers to make a decision. The analysis of the case studies of the EUROPTA project showed that the political role of pTA is far more complex and is related to the whole policy-making process. Moreover, whereas most pTA arrangements seek a direct political role, some try to intervene in the policy-making process in a more subtle manner, for instance by stimulating the public debate on the issue or by raising sensitivity for public participation. But while the discussion of the case studies showed that pTA has an inherent political dimension that can be recognised in the goals set by the organisers, their actual political role often falls short of the expectations.

Many intervening factors influence the political performance of a pTA arrangement. It seems that the 'political success' of a pTA arrangement not only depends on one or two favourable factors but also is the result of a particular combination of factors. This can be said, for instance, of all the consensus-conference-like arrangements outside Denmark; although the procedures are well tested in the Danish context and proved to be working well, various circumstances and factors led to rather poor results (in political terms) in other countries so far. Nevertheless, the analysis in this chapter shows that some factors must necessarily be met for each pTA arrangement to be successful, regardless of the particular aim: *credibility of the institution* and *quality of the process*. Other factors are also important, but they will be more or less crucial depending on the political role aimed at.

From these findings, two general recommendations with respect to the political dimension of pTA can be made (the more specific conclusions are discussed in the previous sections). First, when practitioners envisage the possibility of setting up a pTA arrangement, they must be conscious that, in some way or another, they will act within the given policy system. This can be intended or unintended and the intervention can be strong or minor. As a consequence – and independent from considerations related to the institutional setting and the properties of the arrangement – it is important, before starting any pTA, to consider carefully the actual political situation, so as to gain insights on the timing and the political relevance of the issue. The aims of the pTA arrangement should then be *adjusted to this political situation*. This will make it much easier to gain influence on the policy-making process. Moreover, as gaining influence is a matter of communication, it will be much easier for the implementers to communicate the results of the arrangement.

The second general recommendation mostly concerns the addressees of pTA arrangement – that is, politicians. Often, pTA is considered as an instru-

ment for giving advice to politicians on which decision to take. The analysis in this chapter shows that the influence of pTA on the policy-making process is of a much more subtle nature, as it can, for example, contribute to putting an issue on the agenda, sketch the direction a specific policy should follow or overcome blockades. Moreover, it is commonly expected that pTA should create something new or rescue politicians from a 'non-decision' situation. But, as was shown, in many cases pTA is rather a catalyst. Minority proposals are presented as viable solutions and get a chance to be accepted by the majority, too. In still other cases, pTA can bring new ideas that will develop in time and generate further new ideas. In this respect, the role of pTA on the policy-making process is of a very special nature. Finally, when assessing the role of pTA on the policy-making process, one should not forget that the actors intended to take up the results of the pTA do not always agree with its outcomes. PTA is always part of the political game in which power is at stake.

Chapter 15

Impacts of Participatory Technology Assessment on its Societal Environment

Leonhard Hennen

Introduction

Technology assessment (TA) is a procedure that deals with impacts of technologies on society, the economy and the environment, in order to provide knowledge that is helpful for political decision-making. So, the following could be a kind of a common-sense definition of TA – it is occupied with impacts. The impact of TA studies on decision-making, on public discourse or on technology development is an often discussed but scarcely investigated subject. Does TA or participatory technology assessment (pTA) matter in terms of 'Are there any effects on policy-making, on public debate, on technology development?' is of course a crucial question in debates about TA. It cannot come as a surprise that some of the chapters in Part IV of this book implicitly or explicitly tackle the question of impacts. Did the pTA arrangements under scrutiny in the EUROPTA project succeed in playing the political role that was intended by the implementers? Has the introduction of a pTA method in a new national political culture been successful? What is good management of pTA? These questions, of course, touch on the problem of impacts of pTA and in the respective chapters it is shown, for example, that pTA arrangements have 'impacts' in terms of, for example, playing a specific role in political and social debates on technology (Chapter 14) or introducing a new element into such debates and in technology policy (Chapter 11). In this chapter, the question of 'impacts' is dealt with explicitly referring to impacts in a more comprehensive way – namely, considering the effects of pTA arrangements on various actors and/or various areas of technology policy; and discussing the problem of measurement and identification of impacts.

In political debates on TA – in particular during the process of institutionalisation of TA offices in parliament – one can see that those voices criticising TA, from a left-wing perspective, often employ the argument that TA studies cannot make any impact on decision-making, because the political

system's decisions are guided by vested interests, which are resistant to information that is not in line with the preferences of the decision-makers. On the other hand, from the perspective of those with an interest in implementing technology, it is said that TA will lead to 'technology arrestment' thus supposing an overwhelming (negative) impact potential of TA studies on politics and society. Both perspectives suffer from an unrealistic view of the role of TA in political decision-making. TA and pTA are not designed to influence directly political decision-making, but to prepare knowledge that is relevant for decision-making. PTA is an attempt to include the knowledge and perspectives of social groups normally not involved in technology policy decision-making in order to expand the scope of perspectives considered in technology policy.

Identifying Impacts of TA Procedures

The reason for over- as well as underestimating the possibilities for TA to make an impact is based on a common understanding of the impact of TA following an instrumental model of policy consulting. At the cradle of TA as a concept stood the idea to improve the informational grounds for political decision-making by means of science. The expectations of the clients (political decision-makers), as well as of the TA practitioners have long been that scientific advice should deliver a kind of knowledge that could directly guide decision-making processes into saying what is 'right' or 'wrong', or what will be the effect of doing this or not doing that.

There are a number of well-known reasons why this model does not work: first, TA is not – or in the ideal model of it should not be – 'mandated science'. The clients of TA studies are not usually single actors with identifiable or articulated interests or intentions looking for support or legitimisation by TA. TA – at least when carried out by public organisations – refers to a contested field of interests, preferences and values. Science is part of this field and takes part in the selection and description of problems (Bechmann and Frederichs, 1996), and cannot deliver one best solution, since there are several solutions for several interests and preferences.

Secondly, given the scope of values, interests and respective problem definitions, as well as the complex interactions of ecological, economic and societal systems that have to be considered, TA often does not meet the expectations of political actors who are looking for instrumental knowledge that can directly be transferred into 'recipes' for political action, or that is helpful to legitimise options that are preferred by political actors. TA does not deliver information of this kind of technical instructions for use. TA increases the complexity of decision-making by taking into account different values to assess impacts of technology, by supplying all information and knowledge available and conveying uncertainties or deficiencies of knowledge and opening up the scope of possible choices and options.

A third restriction to impacts of TA as well as to pTA on decisions is given by the societal structures that political decision-making on technological development undergoes in market economies. Technology development, investment in new technologies and exploration of new markets are private decisions that can only slightly be influenced by the political system and public discourse, which in most cases are the addressees of TA. Government, with regard to technology development in most cases, can only establish a regulatory framework with hindsight. The political system is exposed to pressure from technological development as a precondition for economic development, international competitiveness of the national economy and social welfare. On the other hand, the political system is held to be responsible for avoiding negative consequences and adjusting technology development to social values. So the political system, the client of most TA studies, in many cases can only search for consensus that might legitimise developments that have been decided on elsewhere.

Therefore, when considering the impacts of TA, one has to bear in mind that there are serious cognitive, normative and pragmatic restrictions to a direct influence of results of TA processes (in terms of, for example, a change in the political agenda). What TA can provide (and so does pTA) is 'background knowledge' that might be used after having passed many filters of modification, simplification and selection according to the needs and preferences of the user (Lau and Beck, 1989). This makes it difficult to identify whether results of TA have had any influence on decision-making or public debates. Even if, for example, a change in the agenda of the political discourse is identifiable, it is difficult to tell whether it is a result of the pTA arrangement. Arguments, ideas that may have been dominant in the proceedings or in the outcomes of a pTA arrangement, are seldom totally new and can be found elsewhere in political and social debate, so that we can usually hardly tell whether a change in debates is the result of the pTA arrangement. Even when looking for 'impacts' in terms of use made of results of TA in politics or society (not in terms of a change in the political agenda or in decision-making) it is difficult to identify the 'real' influence of TA processes. We can observe that TA results have been referred to, for example, in parliamentary debates several times. Apart from the fact that this does not tell us much about the influence of the arguments referred to, actors may have used the results of a TA study to underpin their arguments or points of view without referring to it. These problems of measurement are well known in evaluation research on impacts of scientific policy consulting (see, for example, Beck and Bonß, 1984).

The literature on knowledge utilisation in scientific policy consulting sees the conceptual use of scientific knowledge as a more important kind of effect of policy consulting processes than an instrumental use. In recent decades, research on the use of knowledge in organisations deconstructed the initial ideal model of rational decision-making by taking into account the values and different interests that are guiding decision-making processes, thus conceptualising the role of scientific knowledge as being strategically used in processes of negotiation and bargaining according to different interests, values and

beliefs (Lindblom, 1959). In the so-called 'garbage-can model' of decision-making (Cohen *et al.*, 1972) the model of rational decision-making (dominated by objective knowledge and argument) is substituted by a conceptualisation of decision-making as an anarchic process in which several actors can put their claims into the process (the 'garbage can') and the outcome of the process is not determined by any kind of rationality, such as use of knowledge or argument as well as rational bargaining on different interests – it is more or less the unpredictable result of a game. Recent research draws on those insights by taking into account the fact that decision-making processes are not striving for the truth in terms of a one best rational solution of a problem, but are games of power, interests and beliefs in which scientific knowledge is used as 'political ammunition'. This, however, does not mean that there is no influence or effect of new knowledge perceived at all, but there might be long-term 'conceptual' or 'enlightenment' effects on the general perception of problems and practicable ways of problem solving. 'Knowledge, including scientifically produced knowledge, flows into the decision-making process through obscure channels from many different sources, and this results in a more general awareness of the way the world appears and is structured.' (Albaek, 1995: 85).

It is obvious that such long-term effects on a rather general level of problem definition or agenda-setting are hardly retraceable to single scientific consulting processes or reports being introduced in the political process. Effects of this kind can be more or less described as 'political careers' of new paradigms – like, for example, sustainable development – which have to be observed over a long period of time, passing through a lot of discussions on different levels of society and being shaped and reshaped by different social actors. Results of pTA arrangements in most cases do not introduce totally new paradigms into political or social debate, but are part of the ongoing process of problem definition and the search for problem solving. The outcomes of pTA may show the preferences of lay people with regard to discussions on risks and benefits of new technologies, or may convey areas of consensus and dissent among different stakeholders with regard to political decisions to be taken, or may open up the scope of problem definitions, interests or values that are relevant for selected areas of technology policy. PTA is a means either to shed new light on concepts of problem solving and evaluation of knowledge claims that are developed in technology policy discussions by integrating new under-represented groups into the process, or to introduce knowledge claims and perception of problems into the hitherto non-attentive wider public.

Impacts as Resonance – Findings from the Case Studies

Discussions within the EUROPTA team conveyed some of the difficulties mentioned above. Discussions always came back to the core question 'What is an impact?' or 'Shouldn't we make a difference between "real impacts" on decision-making or public debates and only some kind of reference being

made in debates to the process or the results of a pTA arrangement?' It proved to be nearly impossible to draw general conclusions in terms of relations between conditions that positively or negatively influence 'impacts' of pTA arrangements. We can of course not provide a conclusive definition of 'impact'; one that would give us the opportunity to measure impacts in terms of 'high' or 'low'.

How to Operationalise Impacts

One way to operationalise 'impacts' is to relate the term 'impacts' to the explicit or implicit goals of the pTA arrangement under consideration (i.e. in most cases, goals of the institution implementing the pTA arrangement). Such goals in the most cases are articulated in a very general sense. Explicit objectives that we can find in the case studies are, for example, to give input to decision-making processes, stimulate public debate and initiate social learning processes. An attempt to explore this is made in Chapter 14.

Another option is to give a multi-perspective view of impacts of the pTA and its outcomes by investigating the expectations of different actors involved, as well as their evaluation of the procedure with regard to their expectations. To do this would have made a series of in-depth interviews necessary, which was not possible in the restricted frame of the EUROPTA project. Most of the case studies only supply information on the expectations of the institution implementing the pTA arrangement.

Given the aforementioned difficulties in analysing impacts of policy-consulting processes in general and TA in particular, this would afford detailed evaluation of pTA arrangements for every single case. This would at least include:

- Evaluation research right from the beginning of the pTA arrangement, in order to get a detailed picture of expectations and intentions of any actor group involved in or observing the process.
- Long-term observation of the carrier of results of the pTA arrangement, including interviews with representatives of the scientific and political systems in order to follow the paths by which results of pTA may be used as background or conceptual knowledge by different actors.

In none of the case studies was this quality of information available to the EUROPTA team. The case studies are mostly based on information and material provided by the institution implementing the pTA procedure. With regard to impacts, 'impressions' reported by project managers or participants of the procedure often have to be relied on. Given this methodological restriction, in the following sections a structured overview is given of the impacts of pTA procedures, for which there is relatively reliable information. In so doing, a broad definition of 'impact' is used, whereby impact is seen as some kind of 'resonance' in the societal and political context of the pTA procedure.

In order to add analytical added value to this description, in a second step types of impacts should be related to possible causes (structures, processes, events), which might be relevant factors in producing or preventing impacts. Owing to the restricted scope of information on impacts, this analytical exercise can only intend to find suggestions for further research on best conditions in which pTA arrangements can have effects on the societal and political context.

First, one can identify types of impacts in a structural dimension. An impact of a pTA procedure can be regarded as some kind of resonance in the following *systems* or *social areas*:

- policy-making process (parliament, administration);
- scientific community (experts, research institutions);
- media (reports on the procedure, on outcomes);
- public debate (reactions of social movements, interest groups, agenda of the debate);
- industry.

In order to clarify the term 'resonance' and thus operationalise the term 'impacts' further, it is helpful to differentiate between *types of impact*, which can be characterised according to the various kinds of reaction to the pTA procedure:

- knowledge/information in relation to:
  - the issue at stake (such as insights regarding the impacts of technology, or options for problem solving);
  - actors involved (knowledge about their attitudes, preferences);
  - pTA as a procedure (knowledge about methods, about the political role);
- attitudes towards/opinion of:
  - the issue at stake (ethical evaluation of problems, evaluation of opportunities and risks);
  - actors involved (credibility of actors or institutions involved, trust/distrust in institutional competence of problem solving);
  - TA as a procedure;
- actors' behaviour/action regarding:
  - the issue at stake (new initiatives for regulation; additional initiatives to explore unresolved problems, or to fill identified knowledge gaps);
  - the actors involved (more interaction between relevant actors, climate of communication, new initiatives to involve the public, or interest groups);
  - pTA as a procedure (improve design of pTA procedures, pTA taken up as a method in other fields, by other actors).

When relating these kinds of impacts or 'dimensions of resonance' to the set of structural dimensions or areas in which pTA arrangements might have resonance, this results in a matrix that can be used to analyse more systematically impacts on the basis of the case study material (see Table 15.1).

Table 15.1 *Types of 'Impact' of pTA on Different Actors/Areas*

Type of impact	Knowledge/ information	Attitude/opinion	Actors' behaviour/initiatives
Impact on:			
Policy-making	**On actors involved** About attitude of lay people/stakeholders (Biotech BW. GE, Citizens' GMO UK) **On issue at stake** Concepts/scenarios for problem solving	**Towards issue** New perspective on problem (Gideon NL)	**With regard to issue at stake** Further investigation: research, commission (Urban Ecology DK) Effect on legislation (Drinking Water DK) Change in political agenda (Gideon NL, Urban Ecology DK, Drinking Water DK) **With regard to pTA** Willingness to take results of pTA into account, 'go on with pTA' (Electricity CH, Biotech Baden-W. GE, Urban Ecology DK)
Scientific community		**Towards actors involved** Attitude towards 'public understanding of science' (Plant Biotech UK) **Towards pTA** Scientific debate on participatory TA (Discourse GMP GE)	
Public debate		**Towards pTA** Comments on the procedure by interest groups (Biotech-Baden-W., Electricity CH, Traffic Forum AU)	**With regard to actors** New climate of communication and co-operation (Traffic AU, Copenhagen Traffic DK, Urban Ecology DK) **With regard to issue** Stimulate debate on new issue (Urban Ecology DK)
Media	**On pTA** Reports with main focus on the procedure in cases where pTA is newly introduced (Traffic AU, Biotech Baden-W. GE, Electricity CH) Reports on results when pTA is a well-established procedure (DK)	**Towards pTA** In some cases comments on procedure (critical: pTA is instrumentalised; supportive: new element of democracy) (Biotech Baden-W. GE, Traffic AU, Electricity CH)	
Industry	**On actors involved** Consumers' preferences Novel Food, NL) Stakeholders' views (Discourse GMP, GE)		**With regard to issue** Change in research and development programme (Novel Food, NL) (Delphi, AU?)

Industry

Representatives of industry have been included in the pTA arrangements as members of the steering committee or on the expert panel in several of the consensus conference-type arrangements among the EUROPTA case studies. There is no specific information on resonance of the pTA arrangement in these cases. There are three cases where industry played a major role as participant and/or addressee of the pTA procedure (Delphi AU, Novel Food NL and Discourse GMP GE). In the case of the Berlin Science Centre (*Wissenschaftszentrum*) discourse of genetically modified plants, one can only assume that the involved representatives of industry gained some new knowledge about the argumentation and problem perspectives of the environmental groups involved, but there is no information about consequences drawn by industry from the process or the results of the pTA arrangement.

In the case of the Dutch project on novel protein food, the workshop (involving consumer representatives) on the opportunities to substitute meat by novel proteins showed that consumers are reluctant to consider products as substitutes for meat but might accept novel proteins as ingredients of food products. This found resonance in the research programmes established by the involved food industry. This case was also the only one in the EUROPTA case studies where pTA was included directly in a process of technology development at an early stage (research phase). In the case of the Austrian Delphi, resonance was reported only in the political system. The results of the foresight (which included a proposal for a new programme on sustainable development, and the creation of new research competence centres in Austria) may have, in the long run, impacts on research and development activities of Austrian industry.

Scientific Community

Resonance in the scientific community (experts, public research institutions) can be expected by way of personal learning of experts taking part in a pTA procedure. For example, experts (and their organisations) may learn about lay people's attitudes towards the issues at stake, or they may subsequently engage in more communication with the public, taking into account fears or demands expressed by a lay panel or stakeholders in a pTA arrangement. Again, not having done interviews with experts attending or observing a pTA arrangement, valid information is missing in the case studies. It is likely, for example, that the Austrian Delphi had some resonance in Austrian scientific institutions and among scientific communities (bearing in mind the relevance of the findings of the forecasting procedure for their research agenda). It is also likely, for example, that a change in political problem definition (as is reported as an effect of the Gideon NL project) on crop protection affected experts and the scientific community (as well as industry). To identify these kinds of effects, however, would require long-term evaluations of pTA arrangements.

Interestingly enough, one of the cases in which the policy-making process had a low resonance (Plant Biotech UK) seems to have caused remarkable changes in the attitudes of parts of the British scientific community towards the general public's (or lay people's) role in debates on science and technology. Chapter 10 reports that the UK national consensus conference on plant biotechnology helped to lead to a change in the British 'public understanding of science' movement. The predominant, so-called 'deficit model' of public understanding of science, according to which lay people's understanding of science is lacking rationality, was questioned through the consensus conference initiative, since the lay panel revealed competence in evaluating plant biotechnology. An effect on the social scientific community, as well as on TA practitioners, can be stated for the discourse on herbicide-resistant genetically modified crops (Discourse GMP GE). This pTA arrangement induced a lively discussion on concepts of participatory TA in Germany.

Media

With regard to the media, the case studies suffer from a lack of systematic analysis and documentation of media reports, but there seems to be a general media interest in the procedures themselves as new elements of public or political debate. In most cases (with the exception of Traffic Forum AU) the implementers of the pTA arrangement strove for an involvement of the media in the process by press releases, press conferences etc. Many of the pTA arrangements had quite a respectable resonance in the media (some not only in print media, but also on TV and radio), although often a lack of differentiated reports on the issue at stake or the results is reported in the case studies (Ozone AU, Traffic Forum AU, Plant Biotech UK, Electricity CH). At least in those cases where the pTA method was newly introduced, the media predominantly report on the participatory procedure as such, in some cases appreciating it as a helpful new element in political debate and decision-making, in some cases being critical or sceptical with regard to the use of the results of pTA in decision-making (Traffic Forum AU, Biotech Baden-W. GE, Electricity CH). The three Danish pTA processes succeeded not only in gaining the attention of the media with regard to the procedure, but also with regard to the results or conclusions of the pTA arrangements. This might be due to the fact that pTA procedures, and consensus conferences in particular, can be regarded as being relatively established elements of political and public debate in Denmark.

Public Debate

Direct resonance in the public debate (in terms of reactions of interest groups) can be seen only as far as reflected in media reports. In some cases there are hints about media reporting made by representatives of interest groups on the pTA arrangement. Again these are comments on the proce-

dure: supporting pTA as being a worthwhile exercise, or sometimes questioning its political role. In some cases, especially those dealing with regional planning processes, pTA seems to have been successful in establishing a new co-operative climate of communication (Traffic Forum AU), or inducing processes of joint problem solving of stakeholder groups (Copenhagen Traffic, Urban Ecology DK). There are some hints that pTA arrangements made issues more prominent in public debate and thus had an effect on the agenda on the public/political debate. The Danish scenario workshop on urban ecology seems to have at least contributed to initialising debates and activities concerning urban ecology on the local and national level (partly due to the active engagement of the Danish Board of Technology in supporting local debates on the issue).

It can be expected that one relevant path in influencing public debate might be the distribution of results by representatives of the stakeholder groups that took part in the pTA arrangement, thus committing themselves to the process and declaring their will to take the results of the process into account with respect to their institution or organisation (as did the stakeholders in the Gene Dialogue CH case). However, information about whether results of pTA arrangements have been discussed within relevant social organisations is missing.

Policy-making Process

Most information can be found on resonance in the political system. This is not unexpected, as most of the case studies cover pTA arrangements within a political institutional setting/a setting of policy consultation.

In some cases, it is reported that parliamentary debates or representatives of the political administration showed interest in the procedure and publicly referred to results of a pTA arrangement by expressing the results to be helpful for decision-making and in being considered for ongoing decision-making processes (Gideon NL, Biotech Baden-W. GE, Gene Dialogue CH), even in such cases where the pTA arrangement was not directly linked to the policy-making process (Citizens GMO UK). Direct references to, for example, lay people's demands, as expressed in a pTA arrangement (consensus conference-type), show that pTA for decision-makers may deliver new knowledge on actors' attitudes. For the case of the citizens' forum on Biotechnology (Biotech Baden-W. GE), for example, it is reported that in a parliamentary debate on regulation of novel food, the demand for labelling of genetically modified food products as expressed by lay people in the pTA process was used as a reference for decision-making. The citizens' foresight exercise (Citizens GMO UK) brought reactions from the Department of the Environment, appreciating the citizens' call for a better, more transparent regulation of the food production system, and invited the citizens' panel to discuss the panel's findings. It is, however, in most cases not known whether this type of resonance (knowledge on actors' attitudes) in the political system caused changes in attitude of the system towards the issue at stake.

In some of the case studies, effects can be found with regard to attitudes expressed or initiatives (action) taken by the political system, which can be directly or indirectly attributed to the results or the process of the pTA arrangement. In the Dutch Gideon project on crop protection, for example, the government minister in charge, in a letter to Parliament, welcomed recommendations of the pTA procedure (preventing crop diseases instead of looking for better environmentally sound pesticides). One of the measures proposed by the minister in a programme on crop protection which was set up later (namely, the funding of crop protection measures that can be applied in small-scale farming) was in line with a major recommendation developed by the pTA procedure. Other observations of a change in political action with regard to the issue at stake in the aftermath of a pTA procedure are reported from the Danish projects on urban ecology (a national committee on urban ecology was established that used proposals of the scenario workshop, such as the creation of a Danish centre for urban ecology), and on drinking water (parliamentary debate on the results; new legislation includes elements of the action plan for solving drinking water problems proposed by the pTA arrangement). Political reaction in most of those cases is in the form of initiatives for further investigation into the issue at stake, such as setting up a committee or commissioning a study (Drinking Water DK). In at least three cases (Gideon NL, Urban Ecology DK and Drinking Water DK), there are suggestions that the pTA arrangement at least supported a change in the political agenda in terms of bringing a new issue or perspective into the political process.

In some of the cases, pTA or a particular method (such as a consensus conferences) was introduced for the first time in the national political context. Not untypical for these cases, one can find reactions of the political system merely with regard to pTA as procedure, and not so much in relation to the issue at stake (Biotech Baden-W. GE, Electricity CH, Gene Dialogue CH). It might not be a minor impact in those cases, when political decision-makers, after the pTA arrangement had taken place, mandated the TA institution to continue organising participatory TA for other issues (Electricity CH, Biotech Baden-W. GE). In this respect, the scenario workshop on urban ecology (DK) seems to have been a success for the model itself. Scenario workshops as a method were taken up by the European Commission, which commissioned pilot studies to use scenario workshops in local policy-making in four European cities. And the method is reportedly widely used in Denmark in education and research, and by consulting firms.

Factors Conducive or Obstructive for pTA to Produce Resonance

A rough classification of causes that may be relevant for the kind of influence pTA could have can be derived from the research protocol (see Chapter 4).

Types of factors that may influence impacts of pTA are:

- Quality of outcome (concrete recommendations or demands, dissemination of outcomes to target groups).
- Procedural setting of pTA (method, who participates?, intentions, expectations of actors involved).
- Nature of issue/conflict/problem at stake (including history of the debate, state of public controversy and political debate, societal context).
- Institutional and political setting of pTA (institution organising pTA, 'standing' of pTA, political commitment to the process, introduction of pTA).

Quality of Outcome

It is of course important to distribute and present the results of a pTA procedure to all relevant actors. It is obvious that the presentation of the results has to be well designed to fit the informational needs of the client. It is, however, difficult to say which kind of outcome may be the appropriate one for pTA. Whether pTA should come up with concrete recommendations or demands, or whether it should give scenarios on future development that are open to political interpretation depends on the issue at stake. When pTA aims at giving advice to policy-making, it will fail to have any impact if it does not come up with concrete problem definitions and demands for problem solving. There is one case study which gives an example of a bad outcome restricting the impacts of a pTA procedure. Owing to problems of the participatory design (young people panel in a consensus conference) the Ozone AU initiative failed to deliver a politically relevant result. The report did not include political recommendations, but very general remarks on the problem at stake. It could not have any resonance in the political system despite a quite strong commitment of government agencies to the procedure.

Procedural Setting of pTA

There are some cases where the problems that appeared during the process were caused by management failures, or by the design of the arrangement. Examples are: the reluctance of the lay panellists (in the case of Plant Biotech UK) to co-operate with the facilitator, because they felt they were pushed in a certain direction by her interference; and concrete conflicts between participants in the Traffic AU initiative. Different expectations of participants sometimes cause problems for the process, but in most of these cases, the reasons for a lack of impact can be found in the bad timing with regard to decision-making, or an unclear mission of the institution organising the pTA arrangement (as in the case of Plant Biotech UK).

With regard to impacts, the credibility of the procedure is of course an important factor. As is dealt with in Chapter 12, the fairness and openness of the process is a problem that is steadily dealt with by project managers to make sure that the results of the procedure can be regarded as unbiased by

the public or political decision-makers. To support the credibility of the procedure and its outcome in the cases of the Swiss PubliForum on electricity and the Danish conference on drinking water, it proved to be helpful to show that the results of the procedures were supported by surveys, thus strengthening the representativity of the results.

Support and commitment by relevant stakeholders and representatives of the political system by involving them in the procedure itself or in the advisory board is helpful in strengthening the credibility and visibility of the procedure, as is shown for example in the Swiss PubliForum on electricity or the Copenhagen traffic forum. This does not necessarily mean that a strong relation of the pTA procedure to the political decision-making processes is always helpful. Detachment from the policy-making process, taking off the pressure of political decisions, may be helpful to create a co-operative climate of problem solving (Gideon NL, Urban Ecology DK).

Nature of Issue/Conflict/Problem at Stake

There is some evidence from the case studies that the opportunities for pTA arrangements' results or findings to be processed or referred to in public and/or political debates are relatively good when there is a relatively open political situation, when relevant actors are looking for new ways of problem solving, and no immediate decisions are at stake. Typically these are situations when the problem is not yet politically well defined, or when relevant actors are searching for common paradigms of problem solving. Among the EUROPTA cases, at least four fit into this bracket: the Delphi AU, Gideon NL, Urban Ecology DK and Copenhagen Traffic DK. In all these cases, results of the pTA process were taken up by relevant actors. In the case of the Gideon NL project, the problem at stake was the extensive use of pesticides (this was a problem hotly debated in the public and in the political system), but the goal was not to look for new legislation on the issue but to develop new visions on how to handle the problem. This was carried out by the Rathenau Institute, which organised workshops with representatives of agriculture, chemical industry, consumers and others. One of the visions or scenarios that the pTA arrangement produced stressed the need for prevention of crop disease instead of developing better chemicals. This was taken up in parliamentary debates and in a letter of the Government Minister for Agriculture in which he addressed Parliament to consider the findings of the Rathenau project. For the first time, the Minister put the goal of reducing the dependency on chemical pesticides in line with the notion of preventing plagues and diseases. The catalogue of measures offered by the Minister included the funding of small-scale cultivation as a means to prevent crop diseases (this was not new, but made an old goal of association of small-scale farmers more prominent in the political sphere).

The scenario workshops on urban ecology can be described as a learning process without immediate need for political decisions Organised by the

Danish Board of Technology, the workshops produced action plans for environmentally sound urban development for local communities. It was more or less a common search for ways to reach a goal that would not be contested. The goal was to make the issue of urban ecology more prominent on the political agenda. In fact the government Minister for the Environment set up a committee on urban ecology that integrated some of the findings of the pTA procedure. Additionally the action plans or scenarios developed have since been taken up in discussions in several Danish communities (also due to the follow-up activities of the Danish Board of Technology).

In cases such as these – where development of ideas is the focus and the objectives are not highly contested – it seems that results of pTA arrangements (which include all relevant stakeholders in the process) have a good chance of being referred to in the public sphere and in policy-making. Of course this is partly due to the fact that the issue at stake is not highly contested, and that the results are often rather abstract, or open to interpretation with regard to the concrete political measures that have to be taken. As a politician was quoted in the case study on the Gideon NL project, the results may have the character of 'the Queen's Christmas message'. But nevertheless pTA may have a good opportunity to initialise learning processes, to establish processes of searching for paradigms and visions (*Leitbilder*) that can be shared by relevant actors as a kind of common reference for debates.

On the other hand, there are several cases where the issue at stake is highly contested, where interest groups hold definite positions with regard to the issue and (this is most important) public debate or political debate has already come to a conclusion (in terms of legislative decisions, and, or engagement of the political system in funding of research and development of the technology at stake). In these cases, public debate on chances and risks may still go on, but actors (and most decisively politics) are already committed to definite options. This, for example, applies to the Rathenau Institute's project on genetically modified animals (GM Animals NL) and to the citizens' forum on biotechnology organised by the Academy of Technology Assessment in Stuttgart (Biotech Baden-W. GE). In both cases the impact, in terms of media coverage of the results of the pTA procedure as well as the uptake of results by the client (parliament and/or government), were said by the organisers themselves to have been rather disappointing.

The Rathenau project on transgenic animals lost its political role when during the preparation of the project the parliament took a definite decision on the subject at stake. The project thus failed to have any visible influence on public and social debate, since these, by the decision of the parliament, had in a way already been settled. The citizens' forum on biotechnology (Biotech Bade-W. GE) has obviously been a well-designed and organised exercise in pTA (similar to a consensus conference process), but it suffered from the fact that an amendment of the federal genetic engineering law had just been passed by parliament, and the biotechnology policy in Germany had shifted from debates about regulation with regard to risks and safety to an active policy to

promote biotechnology and genetic engineering industry as a means to foster industrial development in Germany. Also, the government of the State of Baden Württemberg (the client of the TA Academy, and the addressee of the results of the pTA arrangement) did express its will to promote the regional development of biotechnology industry, and charged the Academy with a project that comprised two parts: (1) an expert assessment on opportunities for biotechnology industry in Baden-Württemberg; and (2) an assessment of lay people's attitudes towards benefits and risks of genetic engineering, which was carried out as consensus conference-like procedure.

It turned out that the results of the expert assessment on opportunities to develop biotechnology industry were taken up at least to support the government's plans to establish a funding programme through the creation of a biotechnology agency. The findings of the lay people's assessment on risks and benefits, however, failed to have any effect. It seems obvious that in a situation like this, where the political discussion on the issue of risks, which was the main subject of the pTA procedure, was closed by the genetic engineering law, and the addressee of the procedure had already decided on measures to be taken (i.e. promoting biotech industry), the pTA arrangement could be no more than an annex to the main task (searching for opportunities to develop the biotechnology industry).

However, when stakes are high and interests are well defined, this does not necessarily imply that it is absolutely unlikely for pTA to have any impact. It might be that relevant actors feel a need for negotiation in order to overcome a deadlock given by the adverse nature of the conflict. PTA may then succeed in establishing a new climate of co-operation by providing an opportunity to learn about perspectives and problem views of relevant stakeholders and opportunities for shared problem solving. In those cases (as in the Traffic Forum AU or the Copenhagen Traffic DK cases) it might not be the result of the pTA arrangement (in terms of a consensus or new knowledge about the issue at stake) that is important, but the process itself. PTA has the opportunity to prepare for a common ground or arena of discussion. Stakeholder TA (as argued in Chapter 13) may sometimes be more appropriate than public (lay people) TA. The pTA arrangement may then develop into a conflict mediation-like process.

Institutional Setting of pTA

Aspects that seem to be relevant with regard to the institutional setting of a pTA arrangement are the commitment of decision-makers to the pTA procedure, the standing and mission of the institution organising the pTA, and the establishment of pTA as a well-known practice within the country.

In the Danish cases, impacts on the process of policy-making and on public debate seem to be relatively visible. This in part may be due to the fact that pTA is a well-known and accepted feature of TA practice here, that the mission of the institution (the Danish Board of Technology) to organise public debate and to give input to the policy-making process is quite clear and well

known, and that the awareness of the public and the political system of pTA in comparison with other countries is high.

On the other hand, there are case studies that reveal a lack of commitment by the political system towards the pTA arrangement and an unclear mission of the institution, which sets major restrictions on opportunities for impacts on public debate, the media and/or policy-making. In the case of the Traffic Forum AU, for example, which involved a workshop series to find ways to resolve local traffic problems, it seemed that the procedure succeeded in establishing a better climate of communication between stakeholder groups in a political deadlock situation. However, the fact that the pTA arrangement was the result of a personal initiative of the deputy mayor of the city and that the city council publicly announced that it was not committed to the result of the pTA arrangement, meant that the pTA failed to have any relevance in the political process.

In the Biotech Baden-W. GE case, the political commitment to the procedure was only a formal or symbolic one. The case of GM Animals NL reveals an unclear mission of the TA institution as being (together with the above-mentioned problem of timing with regard to political decision-making) responsible for a lack of public and political response to the results of the procedure. The Rathenau Institute at that time was in a phase of rethinking or redefining its role with regard to the policy-making process as well as to the public. The organisation of the public debate on genetic modification of animals was an experiment in public activities for the Rathenau Institute, to make the institute politically and institutionally more relevant. The reasons for starting the pTA procedure have more or less been institutional ones; the mission of the procedure with regard to the political process became unclear because during the preparation of the pTA arrangement a political decision on the issue at stake had been taken.

There are several cases where pTA as a procedure was introduced, for the first time, in order not only to test a new method, but also to give TA or a TA institution a voice in technology policy debates. With the exception of Denmark and the Netherlands pTA is still a new, not particularly well-known, and by no means widely accepted feature of technology policy (either on the local or on the national level). Therefore what is found in several cases is that the media do not report on the results of the procedure, but on the procedure itself as a new, interesting or problematic method. Similarly, reactions by interest groups or actors of the political system are with regard to the method, not to the results.

The case of the Swiss PubliForum on energy policy seems to be an example of a successful introduction of pTA into a new context. It had a respectable resonance in the media and in the government, but very clearly the media generally did not discuss the problem at stake but showed an interest in the method. The Federal Council (the government) encouraged the TA Centre to continue to use similar processes. The Centre was invited to present the results of the Forum to the commission of energy in parliament. Whatever the effects on decision-making may be in the aftermath of the pTA process, the pTA

arrangement obviously gave visibility and legitimacy to the rather new Swiss TA programme. This is an impact that may be a precondition for impacts on the policy process and public in terms of resonance to the procedure's results and stimulating debates in the future. There are good reasons for this form of impact: the problem at stake was prominent in the public as well as in the political system; the end of a 10-year moratorium on nuclear energy was in sight, parliamentary debate on a new energy law was under way (but had not yet ended in a result), and the potential for resistance to nuclear energy in the Swiss public was high. The procedure was in fact perfectly timed, and was well prepared, especially in terms of intensive media contacts.

Conclusions

There seems to be some evidence from the EUROPTA case studies that the issues at stake and the state of public and political debate are important factors for pTA arrangements to have resonance in their respective societal and political contexts. It is difficult for pTA arrangements to produce impacts or effects on their own where there is no attentive context. Resonance in politics, the public sphere, science etc. is, above all, dependent on the logic and/or state of debate of the issues themselves.

If relevant decisions have already been taken, impacts on the political system and also the media are unlikely to appear. Other relevant factors are connected with the institutional setting: it is relevant whether the pTA procedure is carried out in a political setting where the procedure is connected to an expressed political will to involve the public/citizens. One can also see that in some cases the procedure itself causes the main impact on the media; media often do not merely report new knowledge on the issue stemming from a pTA procedure, but perhaps convey a new attitude to pTA or involving the public – the pTA procedure itself is the message. This fact again can be related to the institutional and the political context: in a political context were pTA is new, or where the mission of a pTA procedure (and or institution) is not clear, the 'issue at stake' is the legitimacy or credibility of the procedure itself, and impacts can be expected in terms of improving the societal or political standing and visibility of the institution.

The findings from the case studies have of course to be weighted against the fact of the restricted quantity and quality of information concerning impacts one finds in the case studies. There seems to be, however, some support of the findings of knowledge utilisation research, that a conceptual use of results of scientific policy consulting is more likely to appear than an instrumental use in terms of direct implementation of knowledge into decision-making.

What can be added from the case studies to these findings is that opportunities for pTA to have an effect on political or social debate are dependent on the issue at stake and on the state of public or political debate. With regard to the research framework of the EUROPTA project (see Part II), it

appears that the contribution of pTA to the process of dealing with uncertainty and inequality may mainly be in promoting social learning. The framework supposes that social learning includes the 'adoption of new factual knowledge', 'gaining insights into the rationales of other actors', and 'development of new strategies'. It is obvious that preconditions for all these aspects of social learning are given in an open situation of searching for common problem definition and options of problem solution. Such a situation may be given:

- in an early stage of technology development, when searching for feasible and socially sound technical solutions for socially defined problems, as was, for example, the case in the Novel Food NL project searching for ways of achieving sustainable food products.
- when there is a shared need for a common new paradigm or *Leitbild* of problem definition and solution. This might be due to the fact that relevant actors block each other and none of them is able to steer the situation according to his/her own interests, as in the two cases on traffic (Traffic Forum AU, Copenhagen Traffic DK). Alternatively it could be due to the fact that there is a widely accepted problem where search for shared solutions is necessary (Urban Ecology DK, Gideon NL).

Cognitive, normative and pragmatic uncertainty in this situation may be 'equally distributed' among relevant actors. Pragmatic uncertainty may be particularly important here, because actors are not sure about what might be a successful strategy in their own interest. Whilst this assumption is quite plausible (and by no means new), it cannot be confirmed conclusively on the basis of the EUROPTA case studies, due to the limited information available. In particular, it is difficult to come up with a conclusion on the opportunities of pTA procedures to induce processes of social learning with regard to settling debates and conflict situations, where openness for joint problem solving is missing. In the long-term perspective, participatory procedures may have the chance to change the climate of debate and foster an exchange of arguments instead of politics of power. In this respect the 'procedural' impact of pTA as a new arena for constructive debate, as an element of an emerging new political culture of political debate and decision-making in the field of technology policy, might be an important issue in further research on impacts of pTA arrangements. The fact that there is a noticeable growing demand for pTA in recent years to a certain extent supports this hypothesis. Again, however, it is up to long-term studies, following the different paths of the outcomes of pTA arrangements in different fields of society, to clarify what role pTA plays in technology policies, and to explore what opportunities pTA has to make a difference to a more technocratic style of technology policy-making.

Reference to the impact of pTA has to refrain from expectations of direct political impacts. The grid (or structure) describing resonance that has been applied in this chapter (Table 15.1), giving an overview of what lies on the

surface with regard to impacts of pTA, may be seen as a starting point for more in-depth research on the conceptual use of results of pTA, and the political effects of the procedural or cultural change that might be had from introducing pTA in the context of technology policy.

Chapter 16

Conclusions and Recommendations

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Drawing Conclusions from the EUROPTA Project

European participatory technology assessment (pTA) has, over the last 10 to 15 years, evolved into a rich, diverse activity, ranging from numerous stakeholder round tables, scenario workshops and lay consensus conferences to biotechnology studies, technology foresight and urban transport policy reviews.

One of the objectives of the EUROPTA research project was to 'map' this activity, so as to obtain a more systematic overview of the status of European pTA at the beginning of the 2000s. Apart from individually characterising, in the form of case studies, participatory methods and their particular institutional and national implementations, the EUROPTA project also sought to analyse comparatively and cross-nationally the various participatory experiences. This was accomplished by using a common research framework for the empirical study, and by carrying out a transversal analysis of various aspects of pTA.

The results and conclusions of the EUROPTA research project presented in this chapter refer to the research framework (Part II), the case studies (Part III) and the transversal analysis (Part IV). They should be read with the following qualifications in mind:

- Because of the considerable diversity of methods and the related intellectual, cultural and institutional traditions featuring under the term 'European pTA', the conclusions are necessarily of rather general nature. What this means is that while these conclusions would seem to hold true for the issue of pTA as a whole, at the level of individual participatory arrangements they ought to be considered in close relation to the context-specific factors in play.

- The more detailed, issue-specific results and conclusions are to be found in individual parts of this book, notably the research framework (Chapters 2–4) and the five analytical contributions (Chapters 11–15), and are not repeated here.
- The conclusions and recommendations in this chapter were reached collectively, thus reflecting on what the EUROPTA research team as a whole managed to agree.

At the end of the various sections, the main recommendations are summarised in boxes.

The Role of Participatory Technology Assessment

Much of the research undertaken as part of the EUROPTA project dealt with the functional role given to pTA. The aim was to achieve a more in-depth understanding, both theoretical and practical, of what purposes participatory forms of TA serve in various settings. As the genealogy of pTA is inextricably linked to that of policy analysis, the relationship between the two deserves special attention, as does the relationship between pTA and the decision-making processes of representative democratic systems.

PTA as a Complementary Form of Policy Analysis

The EUROPTA research shows that pTA, as currently practised in Europe, can have one of a variety of distinct roles of 'assessing' socially relevant issues of science and technology. Broadly, this includes:

- evaluating public attitudes towards, and expert opinions of, new technologies;
- identifying and characterising problems;
- helping to resolve conflicts;
- drafting policy options for R&D and/or for technology implementation;
- creating visions of future policies;
- creating (social) networks around technologies;
- carrying out strategic planning.

Arguably, most of the above roles are also part of 'classical', expert-oriented TA and, more generally, policy analysis. However, pTA is extending the analytical scope in comparison to classical TA, which in itself lends the outcomes/products of pTA a different quality. First, the participatory element increases the information on the social or political acceptability of, and agreement on, different viewpoints. Secondly, the involvement of social actors other than experts in the assessment processes often has a direct bearing on the credibility of the outcomes: where expert analysis alone may not be perceived

as credible due to the contested status of expertise – as is often the case in issues dealt with in technology assessment – the participation of a wider range of social actors can help to induce social credibility of the assessment, for example through their common problem definition and the broad range of social actors they represent. This is particularly the case if pTA actively responds to the (cognitive, normative, practical) uncertainties and inequalities found in socio-technological controversies (see Part II).

PTA should not be seen as competing with classical expert TA, but rather as a necessary complementary element thereof. As classical TA has certain limitations regarding its social functions and credibility in comparison with pTA, generally TA methodology ought to be complemented with participatory procedures.

Social Learning as an Extended Role of TA

In addition to serving as a particular, socially oriented form of policy analysis, pTA is often found to have an extended role linked to the debate about science and technology among the participants or among the wider public. This is the role of furthering deliberation, social learning and discourse, a role that is particularly visible in those participatory methods/arrangements where the wider public has access to the assessment procedures, either directly or through the media. Although less visible, the role is certainly also contained in the more closed expert/stakeholder procedures, as the participating stakeholders learn from, and about, each other and can be expected to utilise their experience of participating in the TA in their everyday life.

Through this role of encouraging debate, social learning and critical political discourse, pTA has the potential to enhance social cohesion and strengthen civic discourse. It goes without saying, however, that a precondition for this is the credibility and perceived legitimacy of the pTA arrangement and its institution.

Although rarely particularly well articulated, this role is often an important motivation behind the establishment of pTA. Seen in this light, then, pTA is not just an advanced, more sophisticated tool of policy analysis for, and of, experts and decision-makers, but more broadly a means of appropriating technology to the needs and expectations of society. What this means is that pTA – both its contents and procedures – effectively becomes more firmly embedded in social discourse. Compared with traditional expert analyses, pTA thus helps to broaden the range of actors, and to open up scientific-technological analysis to the public sphere of discourse, debate and controversy. Out of this, certain tensions may arise within a participatory arrangement, such as when there is a mismatch between the output-oriented policy analysis aspect and the process-oriented discourse aspect of the arrangement. The ability to combine the two aspects in suitable fashion may be said to be an 'art' of competent pTA management.

Where, in the course of identifying issues for treatment in TA, a need for social learning, critical (public) discourse and/or mediation is found to be a key characteristic of a given issue, the use of participatory methods seems appropriate and should thus be given due consideration.

PTA and its Relationship with Decision-making

One argument often used against pTA is that it muddies the water relating to the proper functioning of representative democracy. The reason for this, so the argument goes, lies in the competing claims for representation between elected politicians and appointed professionals on the one hand, and those involved in pTA, on the other. The EUROPTA findings do not support this argument. Although certain social actors may occasionally express – sometimes it would seem for tactical reasons – the fear that pTA competes with existing decision-making processes, the participatory arrangements held to date have been found to be complementary to the policy- and decision-making systems in place. There is no evidence from the EUROPTA case studies that pTA acts as a new power-base competing with existing political institutions. On the contrary, participation seems to act the same way as classical TA – as a supportive or consultative function for politics. The few projects among the EUROPTA case studies whose aims could be interpreted as 'direct political action' turned out to have effectively played a consultative role only.

These findings correspond with the fact that it has thus far mostly been public institutions (parliamentary organisations, government offices, local governments, independent public organisations) that have been charged with holding pTA initiatives on a wide range of socially relevant issues of science and technology. In other words, it seems to be the representative democratic system itself which, in response to public controversy and pressure, wishes to improve and open up the discourse processes of science and technology policy- and decision-making.

PTA should be explicitly established, in order to improve public discourse on, and political opinion forming about, science and technology, with the aim of supporting policy-making with relevant processes and inputs. Participants should not expect to get a decision-making power-base from pTA, unless the existing power-structure is represented among the participants.

PTA in a National Context

Globalisation is an important issue in the fields of science and technology. The technological agenda is increasingly set within an international context, as scientific-technological research and development take place across national borders at a global level. Then again, much of current legislation and regulation remains within the realm of national governments and occasionally limited supranational governments (such as the European Union and the Council of Europe). The EUROPTA research shows that there is an apparent need for national pTA, in spite of – or perhaps because of – the increasing globalisation of science and technology. From a pragmatic point of view, pTA at national level makes sense, as the implementation and appropriation of science and technology to suit the particularities of a nation or cultural entity is the prerogative of national or regional governments. National pTA also seems to make sense normatively, as national governments seek to clarify and reassert their role within a global context. Not surprisingly, the national context of scientific-technological developments is usually thematised within national pTA initiatives, such as when regulatory aspects or the role of a nation in relation to international treaties are considered.

A question at the centre of the development of pTA in Europe has been whether a pTA method successfully used in one national context can also be used in another, different national context. This has long been doubted because of the complex interrelationship between a participatory arrangement and its institutional and wider social setting. The EUROPTA research has shown that while the national and institutional context certainly have an important bearing on the actual role of pTA, this does not mean that participatory methods cannot be transferred across national borders to other institutions. Participatory methods, such as the scenario workshop, citizens' jury, future search conference and consensus conference, have been found to work quite well regardless of the type of national/institutional setting. However, the transfer of a method from one country to another often brings about a relative shift of functional role, as the understanding of the role of (participatory) TA and the standing of the institution involved tend to differ from country to country.

> As the functional role of pTA differs between countries due to variance in national political culture, and – paradoxically – because national politics have to consider the globalisation of science and technology, there is a need for national institutions performing pTA.

Towards a Pluralistic Approach to the Theory and Practice of pTA

There was no overall, comprehensive theory of pTA available when the EUROPTA research project was started. The first task of the project, therefore, was to put together a research framework, on the basis of which the empirical

research could be carried out. The EUROPTA team opted for a pluralistic approach to the different theories, concepts and models that can help explain the multiple aspects of pTA. This eclectic approach turned out to be useful and productive. The most important elements making up the resulting research framework, and thus helping to explain the need for pTA, are:

- the inequalities and uncertainties attached to scientific-technological developments, which calls for more inclusive, social policy analysis and decision-making;
- the status of expertise as part of the problem of scientific-technological controversy, and 'enlightened' social discourse as part of its solution;
- the multifaceted nature of the 'problem situations' tackled by pTA, requiring a broad methodology that provides various 'tools' to deal with specific 'problems';
- the (potentially) multiple roles of pTA, as seen from different vantage points;
- the communication among diverse social actors, which calls for discourse ethical standards that ensure fair and equal representation of viewpoints.

Conditions and Requirements for the Practice of pTA

Institutional Impartiality and Competence

The institutional setting of a pTA arrangement sets certain (limiting) boundaries, but at the same time creates positive opportunities. Given one of the overall objectives of participation – to produce policy options through high-credibility processes – independence and impartiality of the responsible institution are of great importance. How exactly the necessary independence is established is not that crucial, as long as there is a credibility connected to the institution, making it possible for the stakeholders/citizens to engage in the TA and feel assured of the impartiality of project management.

However, building up such credibility takes time. The expert community, the stakeholders, executives, politicians, citizens and the media all have to gain positive experiences of the TA institution and its methodology. This takes many projects with various kinds of participation. Encouragingly, though, this can be achieved, as the EUROPTA project has shown.

The need for independence and the (in the wider sense of meaning) political role of pTA suggests that ideally such institutions should be established with responsibilities towards parliamentary debate (parliamentary TA) as one of the obligations. As the credibility of pTA is socially and culturally defined, and thus of another kind than the credibility of scientific analyses, it is important not to impose a rigorous demand for scientific working methods on assessment activities, as this would hinder the participatory activities. This in general speaks for formal setting outside the scientific community, or at least for a pronounced profile of practice that goes beyond traditional scientific activities.

It is recommended that independently functioning TA institutions be established within the public domain, with the remit to build up expertise in participation. The institutions should be given permanent status, because of the required expertise and continuity, the time it takes to build up credibility, and the importance of experience with many different methods.

Defining Impact Goals

Whether a pTA initiative shows an impact is obviously not only of interest to those who organise it and those who participate in it, but also to those who commission the initiative – often public/political institutions.

As the role of pTA can be manifold, its outcomes and impacts can consequently be expected to vary. The question of the nature of impacts in relation to pTA has thus far been poorly investigated, and the required means of evaluation are not readily at hand. Despite the fact that empirical evidence was hard to come by, the EUROPTA research team devoted much of its time to analyse the role and impact of pTA, resulting in the conclusion that there is a need for a multifaceted view of what 'impacts' are in connection with pTA. Consequently, pTA activities should not be evaluated alone in terms of their direct impact on political decision-making. Improvements to the communication between actors (politicians, stakeholders, experts, consumers/citizens), as well as of the cognition of the problems and solutions are examples of other, sometimes more important, impacts.

The expectations of impacts should be realistic. 'First-timers' should level their ambitions to their experience, to the status of the project in the wider public, and to the type of their contacts with the various target groups. A project made locally by an *ad hoc* organisation with a minimum budget should not put up national policy changes as their main criteria of success. Even well-established TA institutions should, as part of their methodology, develop a communication strategy in order to be able to maintain realistic expectations among their users and customers. If expectations are unrealistic, any initiative will end up disappointing, no matter how satisfactory the actual outcomes are, as seen, for example, from a cost-benefit point of view.

Initiators, practitioners and users of pTA should develop, communicate and maintain realistic expectations of the impacts of participatory activities. Furthermore, they should appreciate the multiple roles, outcomes and impacts that are characteristic of participation. In general, expectations should be commensurate with the given conditions of institutional status, experience, resources, and available time.

Introducing/Adapting pTA

The introduction of participatory methods into new (organisational) situations – a national context, a parliament, a TA institution – should be done carefully regarding the adoption, modification and/or new development of methods.

An analysis (prior to the implementation of the pTA arrangement) should determine whether a well-established method can be imported and used one-to-one, or whether there are good reasons for modifying the method. It should be taken into account that modifying a method may spoil important features of the method.

It is advisable to take a rather conservative approach to the modification of methods, unless a thorough analysis of existing experience calls for adjustments. In particular, it is recommended to try to avoid changing the parameters that make up the specific qualities of the method (such as the search for 'common ground' in the future search conference, or the consensus element in the consensus conference).

Despite the need for a cautious approach, the process of trying and adapting participatory methods should be encouraged, since there still is a need for new methods and the introduction of participation into new arenas.

Development of new participatory tools might sometimes be the most feasible way of introducing participation in TA. If so, the recommendation is to involve experienced practitioners in the design phase.

Using a 'Toolbox'

A thorough analysis of the problem situation (what is at the heart of the issue to be considered, and how the institutional setting is characterised) should primarily determine the choice of a (participatory) TA method. Since the problem situation is influenced by a broad set of variables (such as timing, the nature of the technology, the innovation system and the institutional setting of the organiser), the set of methodological tools required is equally broad. In other words, there is no such thing as a universal method. Although there are already several methods at hand and new ones are being developed, there is still a need for further participatory methods to suit the different tasks facing pTA. Here, one problem is that institutions with no or little experience of pTA are often unaware of the range of methods already available.

It takes a full 'toolbox' to be able to pick the right method. Inexperienced organisers do not usually have such a toolbox at hand, and consequently may make methodological choices that are sub-optimal for the problem situation at hand. Such choices – of which examples have been seen in the EUROPTA case studies – may result from a decision to pick a method first and only then choose an issue. This may be good for the purpose of introducing pTA *per se*,

but it may be less ideal and efficient for achieving impacts in relation to the issue at stake.

As the 'toolbox' of existing pTA methods is rather well equipped, what seems important is to build up expertise and continuity of using the available methods.

> In order to achieve an optimal method selection for the treatment of a given topic in pTA, the organiser ought to make use of a comprehensive problem situation analysis and choose the method according to the characteristics of the specific problem situation. It takes a certain insight into the nature of available methods to make such choices competently. Consequently, it is recommended that institutions be set up that can ensure expertise, experience and continuity relating to participatory methods.

Communicating Participatory Methods

In many respects, institutionalised TA has been leading in the development of new, interactive methods of participation. Policy analysis fields other than those concerned with science and technology policy have begun to consider using participatory methods. Local authorities, national institutions and international organisations working in various areas of social policy increasingly appear interested in exploring the potential of social actor (stakeholder/citizens) involvement. It would seem important, therefore, to develop strategies for communicating the participation methodology developed in TA to interested parties outside the TA community.

> Due to the interest in the issue of stakeholder/citizen participation on the part of various organisations, public institutions and individuals working in the broad field of social/public policy, there is a need for strengthening the communication of aims, structures, procedures and related 'best practice' of existing methods of pTA.

Further Research Recommended

Following on from the research carried out under the EUROPTA project, there are several aspects of pTA that are in need of further investigation. One such aspect concerns the quality of outcomes resulting from pTA. There has been a relative lack of analysis of what makes an outcome qualitatively high or low. The issue of outcome quality is obviously linked to the aims and expectations of the related pTA arrangement. The analytical paper on management (see Chapter 12) touches on the issue of quality, but there is a need for a more detailed characterisation of relevant criteria.

Another aspect concerns the impacts of pTA. The EUROPTA analysis shows that there is a need for a more sophisticated understanding of what constitutes 'impacts', and how impacts should be evaluated. One of the problems facing the EUROPTA project was the relative absence of empirical evidence about impacts (see the relevant sections in the case studies, and Chapter 15). Future research should aim to further develop a typology and evaluation methodology of impacts and investigate the extent to which pTA arrangements impact on policy-making, social learning and public debate, and how this relates to the perceived usefulness of the individual arrangements.

Future research should also try to compare 'classical' expert TA with pTA. Here, it could be useful to characterise and compare the respective functional role, organisational feasibility, procedural and outcome qualities, strengths and weaknesses of both types of TA. This would help to determine the extent to which the two types may be complementary, and clarify the problem situations which should trigger the use of the one or the other TA strategy.

There is a need for further research concerning:

- quality criteria relating to the outcomes of pTA;
- the characterisation of the various types of impacts resulting from participation, and the development of impact evaluation tools;
- the comparative analysis of the aims, function and impacts of classical TA and pTA.

Practical Implementations

Implementations at European Level

Finally, with the practical application of these research findings in mind, the EUROPTA team would like to propose a number of practical actions aimed, among other things, at developing new participatory methods for use in novel situations. In particular, it is proposed that pTA be explored at European transnational level, in line with the pan-European developments of, and public debate about, science and technology. Given the existing experience of pTA at national level, such transnational TA should be able to be implemented on the advice of a team of national experts at reasonable costs and within a feasible period of time. In order to induce a learning process beyond the actual participatory arrangement itself and achieve active co-operation, it may be advisable to start with stakeholder participation.

Transnational implementation of pTA is recommended in line with the transnational development in science and technology policy. The following actions are suggested:

- pan-European pTA. Modified versions of existing methods (for example, the consensus conference) could be developed to instigate pan-European citizen and expert panels;
- simultaneous national participatory activities among the European Union member states. Existing methods could be used nationally, and the outcome of the national projects could be compared and/or aggregated at European level.

'White Spots on the Map'

There is a case for designing new methods that allow for the active involvement of political decision-makers at various stages of the participatory procedures, so as to achieve better integration of pTA into the policy- and decision-making processes. Some existing methods make it possible for politicians to involve themselves in TA, but our case studies leave the impression that such participation does not (yet) bring enough added value to this target group in proportion to the considerable amount of time required for their participation. Methods and procedures are required that more directly address the needs of decision-makers in the course of the TA process.

Social learning among the participants of a participatory process is an important outcome. In some instances it is possible to embrace 'the whole system' of social actors within one participatory arrangement, and the effect of social learning may subsequently result in a significant change in the roles of, and interaction among, the social actor groups. But in other situations, existing methods are only able to involve a fraction of the relevant social actors, and consequently the resonance of the process may be relatively low. Most of the existing pTA methods limit the number of participants to typically between 20 and 40, and therefore there may be a point in exploring new methods suitable for larger-scale participation (several hundreds). There are existing methods that involve large group participation (for example, deliberative polls or the voting conference), but the applicability of these methods is limited. A more complete array of large-group methods would serve an important purpose.

There is a need for the development of new participatory methods for the purpose of involving:

- decision-makers directly in the participatory process;
- large groups of social actors.

In conclusion, it is hoped that the EUROPTA research can make a valuable contribution to the ongoing discussion of the role of pTA in Europe and beyond. The researchers and practitioners involved in this project would be interested in taking part in relevant further research and dissemination activities. For example, one idea for future activities floated in the course of the EUROPTA project would be to compile a handbook of pTA methods, containing information on their relative strengths and weaknesses and giving guidelines as to how to put them into practice. Another would be to set up and centrally maintain a pTA network, for which a website could act as a main means of communication. It will be interesting to see whether these (and other) ideas will be taken up and how pTA will evolve in the years to come.

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