

Ethics and Public Participation in Technology Assessment

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Abstract

New technologies and scientific innovations are the subject of intensive ethical reflections. Ethicization makes social controversies about new technologies, understood as conflicts of values and moral issues, even more complex; this needs to be reflected in technology assessment. In this paper we put forward the questions, if and how ethics can be taken into account in the whole range of models of participatory technology assessment (pTA). This ‘democratic’ TA is characterized by the involvement of diverse social actors from academia (experts), business, law, education etc., and the public – represented by interest groups as well as by individual citizens (laypersons). In pTA ethics is involved not just with regards to the policy output of the process, but also with regards to the assessment process itself. This is achieved in the various models of pTA, which have evolved over time, in diverse ways and to different degrees. Given the high potentials of conflict in ethical debates, we conclude that participatory TA is an unpredictable tool with limited possibilities.

Introduction¹

New technologies and scientific innovations are the subject of intensive ethical reflections as can be seen, for example, in the growing number of ethics committees and political funding lines (cf. European Commission 2013; Fuchs 2005; Owen et al. 2012; Stehr 2008). Ethical reflection must examine moral statements and their implicit rules using assessment criteria such as functionality, consistency, generalizability, etc. “In ethics, [...] rules are created to assess actions and these rules are evaluated as to their generalizability” (Gethmann 2000, 63; translation our own). Ethics is thus placed in the tradition of enlightened critique and, as such, has explicitly found its role in technology assessment (cf. Woopen/ Mertz 2014; Kollek 2013; Grunwald 2013).

Moreover, a pronounced “ethicization”, i.e. focus on the ethics of conflicts revolving around scientific and technological innovations, can be observed raising questions about the methods and procedures of technology assessment (cf. Aichholzer et al. 2010; Bogner 2013; Bora/Münste 2012). Ethicization implies that scientific-technological controversies bring about *moral* conflicts (cf. Bora et al. 1997) offering up for discussion of differing models of society’s future (cf. Bora 2009; Grunwald 2012). Such controversies include multiple dimensions of knowledge as well as numerous constellations of social actors. As a result, the question of the design of technology assessment (in short: TA) is vital. In other words, ethicization presents technology governance with the complex task of integrating heterogeneous demands, perspectives, interests, values, and future scenarios. Key question are: In which forms and processes can such diverse patterns of interpretation be negotiated among actors so that socially relevant suggestions for assessment and design are the result? While in the classic process of risk regulation (benchmarking, monitoring, audits) scientific expertise and the reference to “sound science” play a key role, in ethicized controversies about, for example, genetic diagnostics or stem cell research, personal questions of conscience are the focus. “Confessions are made that are based on a conscientious self-examination and self-exploration, not on calculations and prognoses. The focus is on the relational aspect.” (Bogner 2013, 86; translation our own) Therefore, ethicized conflicts are characterized by a high degree of interdisciplinary cooperation in the mode of *deliberation*. TA therefore places its attention more on the *procedural* dimension, where diverging claims to rationality – including ethical ones – are taken into account.

The addendum “participation” in participatory TA (or pTA) first and foremost hints at the inclusion of *citizens*. It aims at integrating the cognitive, the voluntaristic and the normative dimension. The normative dimension attends to the ethical effects on society and on different societal groups. Yet, ethics is involved in pTA not just with regards to the output, but also with

¹ Parts of this contribution have been taken from Abels/Bora 2004 and Abels/Bora 2013.

regards to the assessment process itself. In pTA diverse social actors from academia, business, law, education etc., and the public are involved. This brings about the question of how they interact measured against standards of procedural justice, which are founded on ethical rules (e.g. equality, fairness).

This contribution firstly introduces the underlying *problématique* of participation as an integrative instrument for the social regulation of technologies. Secondly, it sketches out a set of typical pTA models. Finally, we will reflect upon these models and the interaction among the social groups involved in the light of ethical standards for participation.

What is Participatory TA?

The term “participatory” refers to a design that allows to include laypersons and/or interest representatives (stakeholders) and that relates to TA’s policy advising function (Abels/Bora 2004; Bora 2011). Scientific expertise plays an essential role here, although the discussion among laypersons and experts is usually paramount. The participation of corporatist actors (e.g. representatives of industry, unions, environmental associations, etc.) is possible. Typically these procedures are deliberative, that is, discussion-oriented; they have a small but weak decision-making component.

The range of topics and questions dealt with demonstrates the attempt to integrate heterogeneous social rationalities. It can range, for example, from the introduction of genetic testing to the location of landfills or nuclear waste deposits to the use of nanotechnology in food production. In general, these tasks address three dimensions, which refer to various social sub-areas (functional systems):

- the *cognitive* dimension (“What can we do?”) addressed to science;
- the *normative* dimension (“What are we allowed to do? / What should we do?”) to law and ethics;
- and the voluntaristic one (“What do we want to do?”) addressed to politics.

Because pTA strives toward a comprehensive assessment for the purpose of preparing political decisions, it is primarily a coordination process among social discourses that convey scientific, legal, ethical, and political criteria.

Two ideal types can be differentiated: a science- or expert-driven model and a participatory, citizen-dominated model. Both models are, in practice, usually seen in mixed forms. Despite all critique (see Liberatore/Funtowitz 2003) expertise is always included, because scientific knowledge cannot be simply replaced by other forms of knowledge when trying to answer factu-

al questions, and it is an especially irreplaceable input for political arguments. However, there are limits to expert knowledge: Firstly, cognitive limits exist, that is, limits of scientific knowledge or that which can be understood with scientific methods. Secondly, the role of experts in knowledge production is today controversial; they are only *one* source of many when it comes to political decisions. Thirdly, while scientific knowledge needs time to develop, political decision-makers operate under pressure in terms of time and legitimacy. In sum: Expert knowledge remains necessary in policy advising and technology governance, but it is often not sufficient for the production of collectively binding decisions and comes under pressure in political conflicts. Therefore, procedures have developed that link decision-making with expert discourse.

Since the beginnings of TA in the 1970s, a participatory element has been called for; in the last two decades it has been included more often in the practice (see, for many, Bechmann 1993; Burgess 2014; Fischer 1999; Grunwald 2010, 91ff.; Irwin et al. 2013; Jasanoff 2003; Joss/Bellucci 2002; Stilgoe et al. 2014). In pTA, experts and laypersons, decision-makers and stakeholders, opponents and proponents try to arrive at a joint, argumentatively justified decision about whether a controversial technology should be introduced and how it should be regulated. Various models have been created to include laypersons in the advising process; in Europe (and beyond) they exist to varying degrees and also at different levels – ranging from the regional and national to the European context (Abels/Mölders 2007; Abels 2009; Boussaguet/Dehousse 2008; for the latest example of an EU-wide participatory event see <http://www.civisti.org/>).

Participatory TA as an instrument of social integration

Neither politics, law, economics, education, nor ethics are independently able to regulate technology: *Law* is able to secure stable expectations but only reacts with a delay to external changes and pressure to adapt. *Economics* is flexible, but for problems related to the common good, which come up in TA, it has demonstrated a lack of sensitivity. *Education* aims at long-term and sustainable changes via socialization interventions, but because of its long-term orientation and the uncertainty of result, its regulatory usefulness is limited. *Ethics* – understood as reflection theory of morality – may achieve important enlightening effects, but it often (together with science as a whole) remains distant from the practice of decision-making because, as the communication of respect/disrespect, it tends to produce effects that increase conflicts. Finally, *politics* can often only capitulate when it is ascribed comprehensive problem-solving competencies. With its structural “short-sightedness,” politics can often only offer limited solutions for long-term and transnational problems. These functional performance problems are often ascribed only to the

political system. That is to say: Politics is supposed to take care of everything. In light of these difficulties, pTA now represents an attempt to make an integrative mechanism available.

Expert-oriented procedures view regulation primarily as a question of *knowledge management*. Here, one refers to an information-theoretical definition of risk, and TA serves principally to mobilize sufficient knowledge. This TA variant especially enables decisions in law and politics by means of scientific input.

From the perspective of pTA, however, technology regulation is represented first and foremost as a *decision-making problem* relating to a non-specific lack of knowledge (Japp 2000). In contrast to a specific lack of knowledge, in which one knows that something is not known and what that something is and can therefore obtain the missing knowledge in a targeted manner, non-specific lack of knowledge refers to an area of a categorically unavailable lack of knowledge in which one cannot say what is not (yet) known. It is entirely missing from self-observation. Many well-known environmental and health catastrophes in the past decades were first characterized by such epistemic uncertainties and thus by subsequent catastrophic developments (for the DDT case see Carson 1962, for CFCs see Wehling 2006). Participatory TA then primarily fulfills the task of increasing the readiness for accepting political decisions by bringing various actors. By including laypersons the cognitive as well as normative and evaluative aspects shall be addressed.

Current debates on large infrastructure projects illustrate the often fragile legitimacy of parliamentary and administrative procedures, and that rule-of-law processes do not guarantee political acceptance. This was shown, for example, by the protests against “Stuttgart 21” (cf. Kropp 2012) as well as citizen protests against nuclear waste disposal sites, against power lines in the context of the “energy revolution,” against CO2 pipelines, etc.

Democratic reasoning for pTA

Participatory TA procedures are justified by pointing to democracy theories. However, there are multiple democratic-theoretical approaches which are fundamentally different in terms of their premises about the purpose and forms of citizen participation (cf. Schmidt 2010). These differing stances are reflected in the various pTA models and their justifications. As a whole, participatory procedures are assumed to be better able to motivate the participants, expand the basis of knowledge and values, initiate learning processes, show possibilities to avoid and manage conflicts, assert the common good, and, finally, increase the acceptance and legitimacy of political decisions. They are to have a key function in supporting public discussions about the consequences of technology; in contrast, their original, primary function of policy advising could start

to lose importance. Thus, pTA today is in part even in tension with representative democracy. However, these assumptions about the specific capabilities of pTA still require a more detailed analysis (e.g. Bora 1999; Görsdorf 2012). So that these procedures do not prove systematically futile or provoke expectations from politics by the participants, especially the citizens, that cannot be fulfilled and therefore lead to disappointment, a key problem is systematically linking pTA to the institutions of representative democracy. For this, differing political structures and cultures as well as the addressees of pTA must be respected (cf. Abels 2010).

It must first be noted that the citizens' participation in the advising and decision-making processes is fundamental for all contemporary democratic-theoretical approaches (cf. Laird 1993: 343ff.). Yet, they demand different forms of participation. *Participatory* approaches striving for the most comprehensive citizens' participation possible, and *deliberative* approaches focusing on the discussion of arguments in public discourse, both call for individual and direct participation; for these approaches, face-to-face communication among the citizens as well as with representatives of other functional systems is key. For *pluralistic* approaches, in contrast, only citizens organized in groups (stakeholders) are capable of conveying interests into the political process.

Also, the function of participation differs. While participatory approaches view participation as desirable in and of itself and as having an educational function, pluralistic approaches see the importance of participation solely in the effective assertion of group interests. It is thereby assumed that interests are exogenous and then negotiated. Deliberative approaches see the value of participation in better policy outcomes because they are based on better, rational arguments. They also assume that interests are developed in public discourse and can change because of arguments; they therefore are the result of advising processes.

Yet, in democracy theory participation is only one of many political mechanisms and legitimacy can be created in three different ways: (1) via *input*, i.e. access to the political process and participation in it are the focus; (2) via *output*, i.e. legitimacy arising from the best possible policy outputs is essential; and (3) via *through-put*, i.e. the quality of the advising and decision-making procedures is important and aspects such as procedural justice, transparency, accountability, etc.

While input-oriented and procedural democracy theory approaches are primarily concerned with who and how interests and preferences are fed into the political process and how these interests are handled in this process, output, efficiency-oriented approaches focus on the political outcomes and the quality of governance. These aspects of creating legitimacy cannot always be implemented equally. For example, the imperative of citizen participation and the pro-

duction of efficient policies could be in conflict with one another (cf. Dahl 1994). Looked at in this way, participatory approaches tend to neglect the question of efficiency. For pluralistic approaches, in contrast, the assertion of interests in the form of outputs is an important factor; this assertion is the objective of the interest groups' organization and activities. In this respect, pluralistic approaches are focused more on output. Finally, deliberative democracy approaches are not primarily related to the input side; they assume that the quality of deliberation among the participants can also create a better and thus more legitimate output. The quality of the output is their actual objective. However, proof of this is difficult to find, and the chain of effects from input, throughput, and output has only begun to be studied.

Different procedures of pTA

In the following we distinguish between seven different typical models of pTA. The details of these models are outlined in table 1.

Participants: The role of citizens and experts

Participatory TA is primarily concerned with linking the factual and social dimensions in a specific way and creating options for policy advising from this. By the participation of at least potentially affected citizens – as laypersons and stakeholders – as well as the participation of (possibly “representatively” selected) experts, a factually correct decision is to be made possible; conversely, the factual correctness of the outcomes is to result in a socially integrating effect. In other words: legitimacy is to be created by specifically linking participation and efficiency.

Empirically, different pTA models exist. Thus, it is helpful to describe them with the three dimensions “Who?”, “How?”, and “Why?” Concrete forms of participation each combine the characteristics of the three dimensions in a unique way (cf. Abels/Bora 2004):

- “Who?” – Here the focus is on which *actors*, speakers, are selected and included as being communicatively relevant. Two well-known and sufficiently differentiated procedures are representation vs. broad participation of all citizens (also known as “public participation” or “participation of everyone”). Many pTA procedures are found somewhere on a continuum between these two poles.
- “How?” – This dimension relates to the *participatory roles*, that is, the mode of inclusion. Various forms of active roles contrast with audience roles. The fact that even audience roles can be a form of participation – albeit a weak kind often criticized as being insufficient – shows the importance given to meetings open to the public when it comes to implementing political control of legal and political decision-making bodies.

Often the general public is not invited to participate at all, or only in certain events, or only indirectly through the media. Only in special cases is participation broad and open to everyone. Particular importance is hence placed on the question of which role representatives of the public play and which rules guide the options for participants' behavior in the procedure. The seven models identified therefore vary between purely stakeholder procedures and procedures with citizens, experts, interest groups, and policy-makers. The concrete form is expressed in various procedural roles and participation rules: citizen or expert procedures, procedural rules, and the mode of communication (argumentative, negotiating).

- “Why?” – What is the *goal* of participation – that is, why are people included? What is the function ascribed to their inclusion? Advising in the sense of deliberation seems to be the primary reason for pTA and is linked with the expectation of reaching a consensus through discourse. A direct link to decisions is rare. In addition, the functional expectations placed on participation in the different models, the question to whom the results are addressed, and the purpose of participation must be evaluated in each case.

Outcomes: Advantages and limits of pTA

Participation does not automatically improve decision-making, nor does it necessarily contribute to its success (cf. in detail Bora/Hausendorf 2010). On the contrary, participation can increase the number of decisions and thus the complexity of communication (for a discussion of participation and legitimation see Luhmann 1987). In this sense and from a sociological perspective, participation is a normatively neutral concept. Thus, the effect of the inclusion of people in specific decision-making contexts depends on the situational circumstances, the problem to be solved, the actors included, and the modalities of participation.

All of the seven models are directed in general at the legislative branch (parliament) and/or the executive (government, ministries). They therefore have a political importance even in cases in which participation is primarily directed at administrations. As a whole, however, pTA lacks institutionalized inclusion in the structures of representative democracy (Abels 2010).

In what follows we briefly outline the key features of these seven models, before we assess their performance in comparative and synthesizing perspective. We want to highlight that our typology is an analytical one; a mixture of models and deviations are possible:

- Model 1: The key feature of the *Dialogue Procedure* is that the participants consist solely of those interest groups engaged in a specific policy field or active regarding a specific topic. The participants are selected as representatives endowed with special

knowledge and interests; the size of the group of participant varies. The mode of communication in such procedures is arguing, inspired by the idea that a direct and open exchange among stakeholders increases mutual understanding, but also more corporatist-style compromise-oriented bargaining. The dialogue shall help to identify areas of conflict and cognitive as well as normative dissens in order to support political decision-making.

- Model 2: The *Participatory TA in stricter sense* is not open to everybody (in the sense of laypeople), but only to experts and stakeholders, i.e. organised interest groups. The focus is clearly on the cognitive dimension; therefore, experts (and counter-experts) are dominant actors in the procedure. Participants act as representatives for a specific field of (scientific) expertise respectively social interests. Again, the size of the group can vary. The process is itself open to debate among the participants (throughput dimension). The mode of communication is restricted to deliberative, argumentative reasoning.
- Model 3: *Public Hearing* is a Decision-Oriented Procedure for those affected. In many areas of administrative planning (e.g. environmental or urban planning) such hearings are compulsory; thus, they are organized by public authorities, which act as final decision-makers. Besides representatives of the public administration in charge anybody can participate in those hearings. This procedure is based on the principle of due process of law; this opens opportunities, but also establishes limits for the procedure. Administrative decisions have to be based on the scientific state-of-the art; therefore, experts are again important participants who contribute their knowledge. The laypersons have the right to be heard; they can bring forward their claims and interests and they shall be better informed about the issue at stake. The mode of communication is deliberative arguing.
- Model 4: In the Danish-style *Consensus Conference* is one of the most ubiquitous pTA procedures. It also known under names such as “citizens’ conference” or “PubliForum”. At the heart is the dialogue between laypersons and experts. Laypersons are usually randomly selected based on social representativeness (educational, social background, sex, age etc.). The group of laypersons decides on which kind of experts it wants to consult, supported by the organizers and moderators. The highlight is a usually two-day public hearing in which the laypersons question the experts, followed by internal deliberation among the laypersons and the release of a report with

policy recommendations. This procedure shall help to promote cognitive and social learning among the laypersons as well as the experts.

- Model 5: The *Expanded Consensus Conference* follows the design of model 4, but also includes co-opted interest groups in the procedure. In addition to the laypersons-experts dialogue now the exchange among organized groups of civil society (interest groups) and individual laypersons is prominent. The interest groups bring forward their cognitive and normative positions, which are then (most often separately) discussed and evaluated by the group of laypersons (supported by experts). This procedure reflects the plurality of civil society and the important role of organized interest therein.
- Model 6: The *Voting Conference* is characterized by a higher degree of heterogeneity among the participants. Besides laypersons also experts and policy-makers participate. The participants are selected as representatives. The total size of the group can be quite large. Unlike in the previous two models (4 + 5) the participating groups enjoy equal (procedural) rights. In case interest groups participate, they are limited to a ‘supplementary’ role. The involvement of policy-makers is driven by the idea that they shall be directly involved in a process of cognitive and social learning. The objective is to identify via deliberation – open to the public – several potential options. Participants then take a vote on these options. Nevertheless, the procedure is advisory and the vote is not binding on the policy-makers who take part in the Voting Conference. The new element of this model is the combination of deliberative and voting elements.
- Model 7: The *Scenario Workshop* is the socially most diverse procedure. Besides laypersons and interest groups (locally) affected by a potential decision, also experts and policy-makers – selected as representatives – participate in such a workshop. This model shares some similarities with models 5 and 6. The groups of participants enjoy equal rights. The total size of the group can be fairly large; therefore, parts of the discussion can take place in socially mixed sub-groups. This model is future-oriented insofar as the identification of possible scenarios is the core of this type of pTA. The fact that laypersons and stakeholders participate as (locally) affected in the procedure brings in an element of bargaining and compromise-seeking; thus, communication is not restricted to deliberative arguing. The different perspectives shall become transparent and their exchange shall promote cognitive as well as social learning. Thereby, political blockades shall be broken up.

Having sketched out the key features in some detail, we shall now come to the performance-oriented evaluation. In their internal structures, all models are based solely or largely on argumentation in contrast to strategic “bargaining” as their communication mode. The focus is primarily on providing the political and administrative actors with “good” reasons for any potential subsequent decisions. A second objective is the educational function for the general public. This already points to the fact that general technological-political questions play a role, that is, topics that must be discussed argumentatively. All procedures are first and foremost advisory. In ideal cases, the result contributes to, yet it neither anticipates nor replaces decision-making. Even in the Public Hearings (model 3), which is directly included by law in administrative decision-making, the rights of participation are directly related to the *procedural* controls but only indirectly to the control of the outcome. Participatory procedures are thus predominantly based on approaches of participatory, in particular deliberative, democracy but include pluralistic approaches to varying extents.

Given these commonalities, the various procedural models show several clear differences, as well. The procedural synopsis (see table) is characterized by an increasing degree of heterogeneity, by which a diversity of social groups participating in the procedures is meant, from model 1 to model 7. With this heterogeneity, the mode and scope of inclusion is combined in specific ways. Only the Public Hearing (model 3) is in a strict sense completely inclusive in that it potentially makes every interested person a legal participant in the procedure. All other procedural models are representative. They attempt to include the respectively relevant actors (stakeholders, citizens, experts, depending on the roles in the procedure) as affected persons to various degrees and have them discuss a technological-political conflict. Often, the public is only represented via the media. In addition, the procedures are not always open; that applies to the discussions of the layperson panel in a Consensus Conference (model 4) as well as for the debates of a steering committee in the Narrow pTA (model 2). All models contain “islands of secrecy” in which strategic negotiations might take place, or individual groups put up positions for discussion without being held accountable to their respective clientele.

Experts are represented in all procedures. In all models (except for model 1 Dialogue Procedure) experts must grapple with laypersons and/or stakeholders. Thus, in a formal sense and regardless of their heterogeneity, all procedures are “public” in only a limited sense (exception: public hearing). The term “public participation” should therefore be used with caution.

All models (model 1 only to a limited extent) are at their core characterized by communication between laypersons and experts; experts and layperson are given differing tasks. In spite of the heterogeneity of the respective model, one can differentiate among procedures that are

either dominated by experts or by laypersons (e.g. consensus conference), or those that are more balanced between both groups (Voting Conference, Scenario Workshop).

The expected outcomes and concrete goals are often diffuse; exceptions are model 3 due to its legalistic nature, and model 2 whose objective function (consultation) is clearly defined. In the Scenario Workshop (model 7) the agenda-setting function is sufficiently clear. However, there are many uncertainties about large sections of the various forms of consensus conferences. For Voting Conferences (model 6) and Dialogue Procedures (model 1), the objectives are also not particularly clear.

The evaluation of the actual capabilities is thus usually difficult. For model 3 there are empirical studies; its capabilities are severely limited due to strict legal procedural regulations. As a consequence, a number of suggestions have been made to either abolish or to procedurally differentiate the public hearings model (see Bora 2000; Bora 1999, Chapter 8).

Until today pTA is under-researched. At first glance there are no clear and undeniably recognizable empirical strengths of participation. At the same time, pTA is becoming increasingly common, whereby especially model 4 – and variations on this type of layperson-dominated procedure – are popular not only in Europe (cf. Joss 2009). Besides this, pTA models are today used in part in policy areas beyond scientific-technological challenges, even at a pan-European level (cf. Boussaguet/Dehousse 2008; <http://www.civisti.org/>). Still, pTA's political influence must be viewed skeptically.

Model 2, pTA in a strict sense, has remained a marginal. In the specific case of the so-called WZB-procedure (by the Social Science Research Center Berlin), the political “expiration date” of their topic (genetically modified, herbicide-resistant plants) had long since passed after the conclusion of the relatively long procedure; therefore, it did not resonate strongly with parliamentary politics. Still, influence on administrative procedures running at the same time or close to the time of the procedure can be proven for those cases in which pTA results were known. They were selectively used in administrative procedures (Bora 1999).

Whether model 1 systematically goes beyond negotiations is rather doubtful. All forms of Consensus Conferences (models 4 and 5) are of marginal importance in the practice, which also influences their effects. That holds true under differing political-cultural and institutional conditions; even in Denmark – the home country of this type of procedure – the resonance reported by the organizers and supporters of the procedure remains fairly modest. The oft-emphasized indirect effects – effects on the quality and intensity of public debates or the expansion of the knowledge basis and values for parliamentarians (cf. Joss 2002) – have been difficult to evaluate up to the present and are thus still speculative. A first empirical study (Görsdorf 2012) shows

how participants successfully adapt to an attitude of camaraderie within the context of the consensus conference, while communication with the experts continues to be rather difficult.

For model 6, the Voting Conference, one imaginable effect could be the strengthening of public interests. In addition, it must be asked what advantage the voting conference has in comparison to an opinion survey when it has to secure its legitimacy with such a public survey anyway if the conference's representativeness is questioned by those who lost the vote (which is to be expected). Finally, for model 7 (Scenario Workshop) several reports indicate one observable function as that of political agenda-setting. But here, as with model 6, discrediting tactics are also to be expected from the side of the "losers."

From the experiences to date and the problematic state of research one can draw cautious conclusions. A decisive factor for the performance of these models (not including those factors arising from the institutional, legal-political context) could be their structures. More precisely: The distribution of roles in the procedure (the "How?" question). Operating on the assumption that in every case an attempt is made to do justice to the basic imperatives of procedural justice, the distribution of roles between experts and laypersons in the various models remains the most important distinguishing characteristic. It seems that the more laypersons dominate, the less clear the models' normative functions (in the sense of the objectives and the expected results) have been and the fewer reliable scientific evaluations of the empirically observed activities there are. A dominance of experts combined with subject-area or social representativeness in the procedure or with adversarial elements does not guarantee the acceptance of results, but it does increase the chances of arguments being developed that can stand up to subject-area and social pressure and thus also increases the chances of an increased output legitimacy. Due to the dominance of experts, the problem of conveying the results to the political public remains the Achilles' heel.

For procedures with a high pressure to make decisions (due to legal pressures) and a strong legal framework (e.g. Public Hearings/Model 3) a procedural differentiation was suggested (see above). Balanced models with equal participation of laypersons and experts and the inclusion of additional social groups can promise policy advising with a high degree of legitimacy as well as broad acceptance – if this balance is kept stable with procedural rules. However, in most cases the normative functions remain vague and empirically founded evaluations are, in fact, rare.

Conclusion

The basic idea of pTA aims at regulating heterogeneous social rationalities by means of public deliberation. Inclusion of the public or of stakeholders does not usually mean participation in the decision itself, but consulting and advising when preparing decisions. The models' strengths are that they combine cognitive and evaluative dimensions, do justice to the plurality of social forms of knowledge, and react to the changed role of the modern state – which is developing toward an “activating state,” that is, toward cooperative forms of state activity in general. The weaknesses are serious, however. How are these forms legitimized? What type of results do they produce? What function do they have? They also relate to the concrete costs of participation: If procedures do not lead to win-win solutions, then participants may complain about negative effects to their sending organizations (e.g. environmental NGOs) and cultural milieus. Finally, empirical studies have repeatedly shown that the plurality of social discourse is too much for a participatory setting and leads therefore not to a consensual solution but, on the contrary, to increased frustration and lowered acceptance on the part of participants. In other words, participation is used to circumvent difficulties with the expert model, but it does not solve all the problems.

The starting point of our argument is that ethicization makes social controversies about new technologies, understood as conflicts of values and moral issues, even more complex. It thereby provokes controversial debates about society's futures including cognitive, normative and voluntaristic dimensions of knowledge as well as numerous constellations of actors. As a result, the question of pTA models becomes particularly urgent. Ethicization of technology presents technology governance with the complex task of integrating heterogeneous demands, perspectives, interests, values, and future scenarios.

Participation in TA arises from a presumed “failure of functional systems” and, in this light, represents an attempt to integrate differing and conflicting social expectations. Especially for that reason, however, pTA itself is often confronted with contradictory expectations that can essentially provoke “failure.” If pTA is to be successful as a concept, then the expectations placed on the capabilities of this instrument must not be too high. Generated by the ethicization of technology, pTA tries to transform ethical conflict into an integrative procedure, which proves to be a fragile construct eventually. Against the background of high potentials of conflict in ethical debates, participatory TA is an unpredictable tool with limited possibilities.

Table 1: Overview of pTA models

Participatory Procedures of TA							
	Number and Heterogeneity of Procedure Participants → +						
	Model 1 Dialogue Procedure	Model 2 pTA in stricter sense	Model 3 Public Hearing	Model 4 Consensus Conference	Model 5 Expanded Consensus Conference	Model 6 Voting Conference	Model 7 Scenario Workshop
	Interest Group Procedure	Expert-Stakeholder Procedure	Decision-Oriented Procedure for those Affected	Layperson-Expert Procedure	Layperson, Interest Group, and Expert Procedure	Vote-Oriented Procedure	Procedure with those Affected, Experts, and Policy-Makers
Affected							
Laypersons			X	X	X	X	X
Scientific Experts		X	X	X	X	X	X
Interest Groups	X	X			X	(X)	X
Policy-Makers						X	X
Selected Participants	Representative; In part those affected	Representative	“Everyone” participates; Those affected	Citizens: random/representative Experts: selection	Citizens: random / representative; Experts: selection; Interest groups: co-optation	Citizens: random / representative; Experts and policy-makers: representative	Representative
Form of Participation							
Roles	Participating actors equal	Experts = key role	Decision-makers = key role; Citizens supply arguments; Experts advise	Laypersons = key role; Experts as “suppliers of information“	Laypersons = key role; Experts as “suppliers of information“ (input for dialogue with interest groups)	Participating groups equal	Participating groups equal
Procedural Rule(s)	Dialogue between interest groups (in part with participating experts); Transparency of interests and perspectives	Discourse between scientific experts and interest groups	Legal decision; Affected have advising tasks	Layperson panel questions experts	Often separate advising by groups; Position of interest groups evaluated by citizen panel	Evaluation of scenarios that were developed in advance by stakeholders; Coordination of scenarios	Evaluation of previously developed scenarios; separate advising of groups internally within each group and between the groups
Typical Forms of Procedures	Mediation-oriented stakeholder discourse	In stricter sense, discursive pTA	Public participation in administrative approval procedures (technical plant and security law)	Consensus conference, citizens’ forum, citizens’ jury	Further development of consensus conference and citizens’ forum	Voting conference	Scenario workshop (Danish model)

Participatory Procedures of TA							
	- → + Number and Heterogeneity of Procedure Participants						
	Model 1 Dialogue Procedure	Model 2 pTA in stricter sense	Model 3 Public Hearing	Model 4 Consensus Confer- ence	Model 5 Expanded Consensus Conference	Model 6 Voting Conference	Model 7 Scenario Workshop
	Interest Group Pro- cedure	Expert-Stakeholder Procedure	Decision-Oriented Procedure for those Affected	Layperson-Expert Procedure	Layperson, Interest Group, and Expert Procedure	Vote-Oriented Pro- cedure	Procedure with those Affected, Experts, and Policy-Makers
Function of Participation							
Topic Focus	Technology assess- ment and design; in part planning process- es	Technology in general	Technology in indi- vidual cases (e.g. genetic engineering; decision on releasing GMOs)	Technology in general	Technology in general	Technology in general	Technology in general
Addressee	Policy-makers (decisi- on-makers); interest groups; public	Policies in general; Public	Administrative decision-makers	Policies in general; Public	Policies in general; Public	Policies in general; Public	Policies in general; Public
Task/Objective	Initiating dialogue between conflict parties; interactive exploration of objec- tives; possible devel- opment and evaluation of scenarios; identifi- cation of questions of consensus and dissent	Clarifying facts by experts and counter- experts; this creates options for political action; legitimation of political decisions	Deliberation in stricter sense, that is, influ- encing decisions with arguments	Communication be- tween laypersons and experts; Encouraging and informing public debate	Encouraging and informing public debate	Encouraging and informing public debate; perspectives from various groups	Planning process; dialogue among all groups of actors; strengthening mutual understanding
Ascribed / Expected Output	Disclosing various perspectives of inter- est groups / clarifying interests; overcoming blockades; feedback to associations; clari- fying options for political decision- makers	Risk assessment of technology-induced clarification of current situation; uncontro- versial knowledge as basis for making decision	Expected output: 5 normative functions: information for citi- zens, information for agencies, interest representation, legal protection, acceptance / legitimation	Typical layperson opinion; in part agen- da-setting	Exploration of objec- tives; typical layper- son opinion	Filter for competing policy options	Disclosing various perspectives of partic- ipating groups; agen- da-setting; political legitimation; breaking blockades
Democracy Theory Classi- fication	Pluralistic but delib- erative elements	Non-specific; tends toward deliberative	Formally participa- tory, in fact delibera- tive	Deliberative	Deliberative- pluralistic	Deliberative with pluralistic elements	Participatory- deliberative with pluralistic elements

Source: Abels/Bora 2004, 79 ff.

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