

## CHAPTER 2

### ADAPTA ANALYTICAL FRAMEWORK : ANALYSING THE INTERACTIONS BETWEEN PTA, PUBLIC DEBATE AND THE TECHNOLOGICAL TRAJECTORIES<sup>1</sup>

#### ABSTRACT

The necessity of public participation in technology assessment is currently widely acknowledged by policy makers, key institutions as well as many scholars. Such a recognition reflects the failure of current forms of policy making and the need for new types of interactions between science, technology and society. In the ADAPTA project, we consider two types of public participation: structured processes, such as *pTA* and less formal ones such as *public debate*. The central focus of this project is the analysis of the interaction between pTA, public debate, technology and policy process in the area of biotechnology. In order to perform an international and cross-cutting comparative analysis (two different technologies in six countries), a specific analytical framework is developed and it is presented in this chapter.

We refer to the notion of *public debate* as a set of exchanges of viewpoints and/or social confrontations which may include discussions and deliberations in formal processes (ethical committees, ...) as well as informal ones (protests, demonstrations, direct action, media coverage,...) Thus, public debate may be considered as a long process which allows expression and discussion of different worldviews and which favours social understanding of given issues through collective learning processes. As mass public societies are highly segmented, the way one can take voice and the modes of justification of the various conflicting positions are conditioned by formal and informal rules. We propose to use the concept of *arenas* which comes from political sciences to design symbolic spaces of confrontation<sup>2</sup> which influence collective decisions and public policies. Public debate may be confined to specialised arenas or it may overflow and develop through intensive *trans-arena interactions* which challenge the dominant socio-technical networks. This arena framework provides an original perspective on public debate. How can the trans-arena interactions be characterised? Which actors activate the trans-arena work? How do these activities challenge or fuel the policy process? What about the influence on the technological trajectories and on the process of innovation? (...)

This analysis of public debate also allows us to bring the pTA into the "arena framework". How can we characterise pTA in this context? Is it a new arena? If not what is its place in the public space? Is it mainly attached to an arena or is it more independent/isolated?

This perspective also leads us to raise the question of the relevance of the distinction between pTA and public debate. Of course there are obvious differences: pTA is organised and strictly framed by an initiator and generally directly implies non involved lay people; public debate erupts as a the result of mobilisation of social movements and it implies more or less mobilised actors which claim to act as

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<sup>1</sup> For the preparation of this paper, the author has benefited from the contribution of Gérald Assouline, Simon Joss, Sue Weldon and Joao Arriscado Nunes. The arena model has been constructed in collaboration with Claire Marris in a parallel project Joly, P. B., Marris, C., Marcant, O., (2001). Plantes et aliments transgéniques comme "problème public" : la controverse sur les OGM et ses incidences sur la politique publique aux Etats-Unis. Grenoble, INRA, Rapport pour le Ministère de l'Agriculture, DPEI..

<sup>2</sup> Symbolic space means that arenas are neither geographical entities nor organisational systems.

the "porte-parole" of parts of the society (consumers, the "public", the environment, farmers, future generations,...). But what are the differences in terms of trans-arena work? What are the learning effects? What is the productivity of the process in terms of exploration of new socio-technical options? How do the process contributes to the definition of *public* objectives through the integration of a wide variety of world views? What about the robustness of the results?

## 2 - 1. INTRODUCTION

The necessity of public participation in technology assessment is currently widely acknowledged by policy makers, key institutions as well as many scholars. Such a recognition reflects the failure of current forms of policy making and the need for new types of interactions between science, technology and society. Indeed, in the last fifteen years, the issue of participatory Technology Assessment (pTA) has been invested by many actors. This has resulted in a number of experiments unevenly distributed amongst countries and a quite significant corpus of literature in social sciences and political sciences<sup>3</sup>. In Europe, Denmark has certainly been at the forefront of this broad experimentation. The "Consensus Conferences", which were developed by the Danish Board of Technology, have been widely used in various countries<sup>4</sup>. However, consensus conferences are just "the tree which hides the forest" and indeed, a broader set of experiences has developed in various policy and cultural contexts : Citizen's Juries, Scenario Workshops, Focus Groups, Deliberative polls, Strategic Niche Management,... Overall, this broad experiment has allowed to better elaborate key questions and to better understand the issue of participation from a theoretical as well as a pragmatic perspective: How should "participation" be organised? What are the criteria for the best practical implementation of participatory methods at relevant decision-making levels? What are the connections with decision making processes? The EUROpTA project mainly deals with such questions and aims at contributing to a collective learning process of use of pTA at the European level (See Box 2-1)<sup>5</sup>.

However, the questions of broader interactions between pTA and Public Debate (PD) are seldom analysed. Previous approaches mainly focus on the internal properties of pTA and on the impact of these events on policy process. But since the notion of *public debate* is not really problematised and constructed the analysis of the interactions between pTA, the policy process and public debate are generally rather sketchy. These interactions are the main focus of the ADAPTA project (See Fig.1). We propose an "arena framework" which allows to consider through the same analytical perspective public debate, technological trajectories and pTA. In this perspective, pTA differs from other formal dialogue processes (such as legal processes, parliamentary debates, ...) since debate is not anchored within one single arena, but it entails interactions between different arenas. Thus, there is a similarity between pTA and other forms of dialogue and confrontations which favour trans-arena interactions (such as direct action, public protests,...). Of course there are obvious differences: pTA is organised and framed by an initiator; informal dialogue erupts as a the result of mobilisation of social movements and it implies more or less mobilised actors which claim to act as the "porte-parole" of parts of the society (consumers, the "public", the environment, farmers, future generations, patients,...). However, pTA and informal dialogue/confrontations processes have a common effect

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<sup>3</sup> See among other publications : Joss, S., Durant, J., Ed. (1995). Public participation in science : The role of consensus conferences in Europe. London, Science Museum., Renn, O., Webler, T. and Wiedemann, P., Ed. (1995). Fairness and Competence in Citizen Participation. Evaluating Models for Environmental Discourse. Dordrecht, Kluwer..

<sup>4</sup> See table A, in appendix for a list of consensus conferences organised outside Denmark.

<sup>5</sup> The EUROpTA project ("European pTA: Participatory Methods in Technology Assessment and Technology Decision-Making) has been funded by the European Commission TSER Programme. It characterised and compared 16 pTA arrangements in 6 countries (Austria, Denmark, Germany, the Netherlands, Switzerland and the UK). The EUROpTA report has been completed in October 2000 and it is published on : [www.tekno.dk/europta](http://www.tekno.dk/europta).

since they conduct to intense interactions between specialised arenas which allow to integrate a wide range of world views in technology assessment. But what are the differences in terms of trans-arena work? What are the learning effects? What is the productivity of the process in terms of exploration of new socio-technical options? How do the process contributes to the definition of *public* objectives through the integration of a wide variety of world views? What about the robustness of the results?

This new perspective will lead us to closely analyse the issue of the objectives (how does pTA emerges as a solution to a given problem) and of the appropriation of the pTA by the social actors (how stakeholders and actors engaged in the debate integrate the results of the exercise?). This analytical frame is also important in order to capture the way in which public debate and/or pTA may influence the rhythm and the direction of socio-technological trajectories.

In this chapter, we first present a rapid account of the emergence of the issue of participation in TA and of the two key dimensions of such exercises. We then present our analytical frame and we show that it provides a new and innovative way to look a public debate. This analytical frame also allows to give an original account of the societal dimensions of technological trajectories. We finish by presenting the main implications in terms of analysis of the interactions of pTA exercises and other formal or informal dialogue and debate processes in their broad socio-political and technological dimensions.

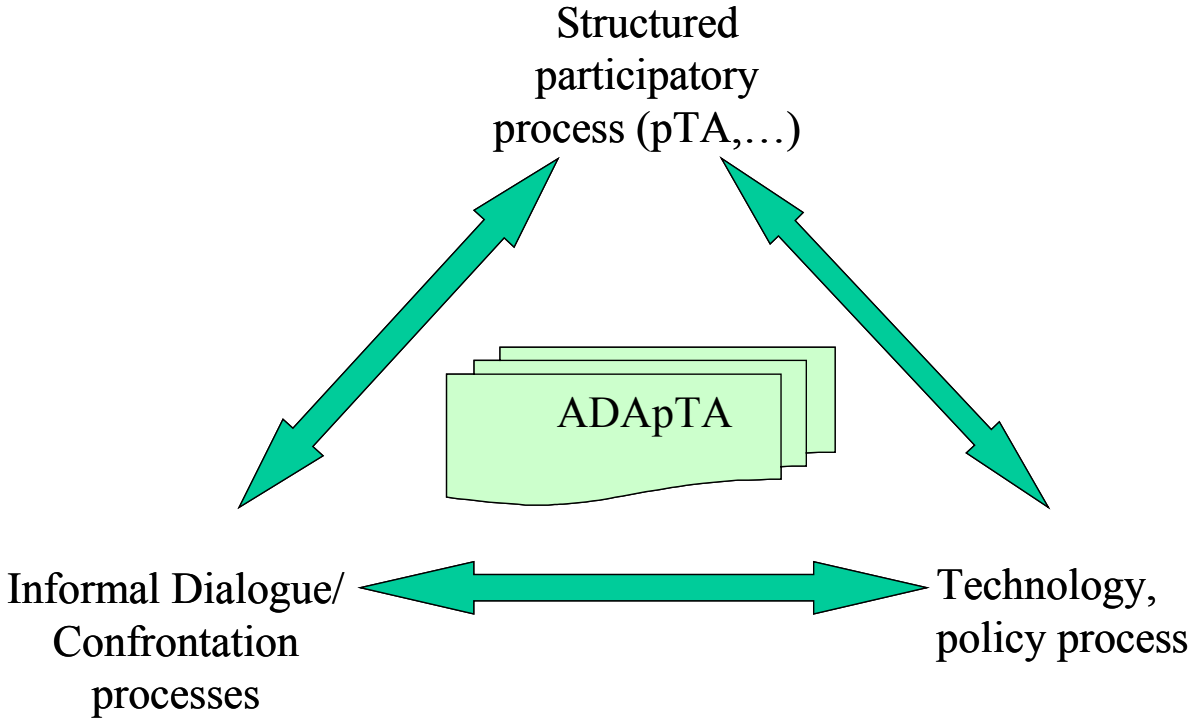


Figure 2-1 . Scope of the ADAPTA project

### **Box 2-1. Objectives of the EUROPTA project (Klüver 2000)**

"The overall aim of the project was to advance, within a multinational context, the understanding of the role of participation in technology assessment by critically assessing the experiences to date of different European national participatory initiatives, to identify criteria for the practical implementation of participatory methods at relevant decision-making levels, and to contribute to the development of participatory methods and practices in technology assessment.

In so doing, the project pursued the following three key objectives : first, to develop a theoretical framework on the role and function of participatory technology assessment, as a basis of both normative-conceptual discussion and empirical analysis. Secondly, the aim was to characterise and compare a series of participatory arrangements in the countries involved. Finally, the third objective was to evaluate and compare the political and wider social contexts of the involved countries in respect of their conduciveness to participatory technology assessment, and to make recommendations about the use of participatory technology assessment, at a national as well as a (European) transnational level.

## **2 - 2. THE MOMENTUM FOR PTA : CHANGING THE CONSTRUCTION OF TECHNOLOGY IN SOCIETY?**

Technology assessment (TA) was initially defined as a tool for policy makers in order to build their own assessment of socio-economic impacts related to technological change. With the increasing importance of techno-science, TA function appeared in the 70's as a key process in order to prevent the capture of important issues by scientists, bureaucracy and/or the economic forces. It was thus designed in order to give to policy makers access to independent, objective and competent information on scientific and technological issues. TA was first institutionalised in the United States with the creation of the Office of Technology Assessment (1972) and then in various OECD countries in the beginning of the '80s. In order for this new function to be independent of governments, TA offices are generally attached to the Parliaments<sup>6</sup>.

TA has developed through a variety of ways according to political culture and institutional settings. As shown by van Eijndhoven, TA was first conceived has a *neutral* assessment of the impacts of scientific and technological developments on social, cultural, political and environmental systems (Van Eijndhoven 1997)<sup>7</sup>. The difficulty to provide decision makers with neutral and impartial assessments appeared very soon. In the US, reflections on how to solve such problem led to what van Eijndhoven calls the "OTA paradigm". It clearly appeared that technology assessment is very often dependent on socio-political options as well as value judgement. Therefore, the way the scientific experts frame a given problem may not reflect adequately the variety of world views in a given society<sup>8</sup> :

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<sup>6</sup> For more details on the institutional settings of TA in Denmark, France, Germany, The Netherlands and the UK, see ADAPTA Task 1 report .

<sup>7</sup> According to Coates V.T. (*Readings in TA*, George Washington University, Washington DC, 1975)

"Technology assessment is the systematic identification, analysis and evaluation of the potential secondary consequences (whether beneficial or detrimental) of technology in terms of its impact on social, cultural, political and environmental systems and processes. Technology assessment if intended to provide a neutral, factual impact to decision making" (quoted in Van Eijndhoven, J. (1997). "Technology assessment: Product or Process?" *Technology Forecasting and Social Change* **54**: 269-286.).

<sup>8</sup> This leading experience of the United States was stopped with the suppression of the OTA in the mid 90's. As far as we know, the suppression of the OTA has not provoked much discussions and has not been specifically studied. Given the importance of OTA as a leading experience and as a much symbolic space of the political control of technology, it would be necessary to clarify this point.

*"The crucial characteristics of the OTA paradigm can be summarised as in-depth assessments leading to reports that provide a thoroughly informed analysis of a policy area in a scientifically valid, non partisan way, providing options for policy development, generated in a process involving stakeholders and tied in particular ways to a legislative client." (Van Eijndhoven 1997)*

In some European countries, the trajectory of TA evolved quite differently. Participatory TA (pTA) was initiated in Denmark as a reaction to a narrow understanding of TA as a mainly scientific assessment. pTA was designed in order to integrate the views, the interest and values of all stakeholders, *including "lay citizens"*, in the assessment process of technological developments and related policy options.

For sure, the Danish experience has been important and as lead some observers to coin the expression "participatory turn". And indeed, since the early '80s, pTA has developed in various countries in a variety of way. As a consequence, when they deal with pTA, scholars and practitioners identify very different types of exercises, from deliberative polls to consensus conferences (Cf. table 2-1)<sup>9</sup>.

**Table 2-1. Examples of pTA methodologies**

Appraisal process	Some key characteristics
Consensus Conferences	Typically involves less than 20 individuals, usually selected on the basis of a random process, stratified to account for basic demographic factors. Involves a series of meetings over a protracted period of time, to which representations are made by different interests groups and specialised witnesses called to a final public conference, with participation by the audience and attendance by the media. Consensus is regarded as a desirable outcome, but (depending upon the context) is often not a requirement - the expression of dissenting views being possible in the final report.
Citizen's Juries	Typically involves less than 20 individuals, usually selected on the basis of a random process, stratified to account for basic demographic factors. Involves a series of meetings over a protracted period of time, which are generally more private than those of consensus conference, with specialist witnesses being called, but no final public conference or media involvement. Generally less focused on achievement of consensus than a consensus conference - dissenting minority reports may be written.
Scenario Workshops	Similar model to citizen's juries, but making use of scenario techniques to envisage favoured and adverse outcomes under different perspectives and circumstances, with an emphasis on the construction of a consensual vision of a desirable outcome of course of action.
Focus Groups	Typically involves less than 20 individuals, usually deliberately selected on the basis of finely formulated demographic or other criteria. Structured discussion of a bounded topic by a small group of selected individuals under the moderation of a trained facilitator with full transcripts recorded and analysed and conclusions drawn by specialists.
Deliberative pools	Typically involves less than 20 individuals, usually selected on the basis of a random process, stratified to account for basic demographic factors. The eliciting of opinions by systematic questionnaire protocols augmented by some form of interactive process, with sampling often performed before and after deliberation.
Strategic Niche Management	Involves a variable number of different social actors with a manifest interest in the configuration of an emerging technology or technological system. Iterative and reflexive interactions, appropriately "modulated". Take place in a variety of ways and over a protracted period of development of the technology in question in a protected niche market.

Source : (Stirling 1999)

<sup>9</sup> Again, we refer to the EUROpTA which presents an analysis of 16 pTA experiences in various European Member States.

Public participation in technology assessment is not limited to such formal exercises. Various authors have argued that less formal and less well-focused activities which go on in civil society, extra-institutionally, can be seen as forms of social technology assessment<sup>10</sup>. This larger meaning of public participation has also to be brought into the picture. Basically, this is one of the main objectives of this project since "Public Debate", as argued above, largely covers this wide social interactions: social mobilisation, stakeholders strategies, media coverage,...

In the frame of this project, we define pTA in a specific way. For a dialogue exercise to be considered as pTA, the following conditions have to be fulfilled:

- . the participation is structured according to rules which are well known by the actors who participate;
- . participants have some direct control on the production of the dialogue;
- . the process does not only involve experts but also *lay people* and/or stakeholders, or actors who are considered as the "porte-parole" of lay people (public interest groups,...)
- . pTA procedures are not just a way to aggregate preferences (like polls or voting) but *spaces for deliberation*, which include the possibility of collective learning and changes of preferences through argumentation and exploration.

Accordingly, pTA is not restricted to processes where there is a lay people panel (such as Consensus Conference) but any participatory exercises cannot be considered. For example, focus groups might be qualified as pTA only under very specific conditions which are not generally met<sup>11</sup>

As argued by many authors, public participation in TA is necessary in situations where there is an uncertainty on the technical possibilities and a debate on the socio-economic, political or ethical dimensions of the choice. In such a case, it is necessary to design a procedure which allows to explore the various technological options from the perspective of different world views. Grin et al. (1998) illustrate this idea with the example of the development of car mobility and its environmental aspects<sup>12</sup>:

*"There is a great deal of uncertainty about the facts because it is difficult to predict car mobility developments and the effects of policy measures on them. It is also extremely difficult to predict the response of potential users to innovations such as electric cars. The value dissent is also substantial. For some people, car mobility is associated with deep feelings regarding freedom and independence. Others see car mobility as the preeminent cause of very serious social and ecological problems. In such cases, debates between the adherents to the various value system is necessary in order to structure the problem." (Grin 1997)*

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<sup>10</sup> See, *inter alia*: Rip, A. (1986). "Controversies as informal technology assessment." Knowledge : Creation, Diffusion, Utilization 8(2): 349-371., Cambrosio, A., Limoges, C., (1991). "Controversies as governing processes in technology assessment." Technology Analysis and Strategic Management 3(4): 377-396., Limoges, C., Cambrosio, A., Anderson, F., Pronovost, D., Charron, D., Francoeur, E., Hoffman, E., (1993). "Les risques associés au largage dans l'environnement d'organismes génétiquement modifiés : analyse d'une controverse." Cahiers de recherche sociologique 21: 17-52..

<sup>11</sup> For instance, people who participate in focus groups are generally not informed on the specific rules of the exercise and they have not any control on the production of the results of the deliberation.

<sup>12</sup> This configuration is very close to the type of situations Michel Callon looked for in his pioneering work in order for the sociologist not to be locked in an analysis of the conflict between "powerful technocrats and weak lay people and between technology and conscience" :

*"In order not to be prisoner of a worldview where machines structure the social world, the sociologist has to look for opened controversies where different negotiations take place, where the nature of the choices may be discussed and where exclusions are not definitive. »*

*Callon, M. (1981). "Pour une sociologie des controverses technologiques." Fundamenta Scientiae 2(3/4): 381-399.*

In such a perspective, the production of a pTA exercise may be characterised in two complementary dimensions :

1. the cognitive dimension : pTA exercises may first be distinguished according to the extent of socio-cognitive exploration which takes place;
2. the political dimension : the second key issue about pTA is the degree to which the results of the pTA are re-appropriated by social actors.

The combination of these two dimensions allows to propose a first typology of pTA (Table 2-2). More has to be said on each of these dimensions.

**Table 2-2. A first typology of pTA**

		Internal productivity	
		High	Low
External impact	High	pTA which develops learning that has radical socio-political impact	. pTA which confirms and amplifies “ready made” consensus . Old and known wisdom which may change society
	Low	pTA as an intensive learning process but with low effects	Low internal productivity and low effects

**2 - 2.1. Socio-cognitive dimensions of pTA**

To what extent does a pTA exercise actually favour a socio-cognitive dynamics which allows to explore a wide range of technological options? To what extent does pTA allow to discuss socio-political implications and to explicit value system? Does it conduct to explore new technological options that better take into account the diversity of worldviews? How does the better understanding of different world views may contribute -or not- to an agreement on *public objectives*?

However, pTA arrangements may also be oriented toward other –perhaps more modest- objectives. In many cases, the introduction of pTA experiences has been presented as a reaction to a perceived failure of the traditional ways to inform the public (e.g. the French and the UK experiences). In this context, pTA is not considered as a one way communication tool but it is also intended to provide a better understanding of public opinion on complex issues. The argument is that, facing unstructured problems, it is very hard to have a good feeling of citizens/consumers preferences because their concerns are not finely shaped. However, the low level of elaboration does not mean that these concerns are not legitimate<sup>13</sup>. In such case, participation of the public proves to be necessary in order to better elaborate these views and, to some extent, "materialise the public opinion".

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<sup>13</sup> For an account of theories and experiences of cTA, see inter alia : Rip, A., Shot, J., Misa, T., Ed. (1997). Managing technology in society. London, Frances Pinter., Grin, J., van de Graaf, H., Hoppe, R., (1997). Technology assessment through interaction. A guide. Den Hag, Rathenau Institute (available at <http://www.rathenau.nl>).

Therefore, a first way to consider the objectives of pTA is to figure out to what extent it aims to understand the public understanding of given technological choices on one hand or to explore new socio-technological options on the other hand (understanding or collective exploration). Both objectives are not mutually exclusive and they may be combined within a single pTA event<sup>14</sup>.

Related to this important dimension several key features which characterise the pTA arrangements have to be considered :

1. what is the diversity of participants in the pTA? How are they engaged in the technological trajectory and/or in the public debate?
2. how the issue is framed and how strictly the process is channelled? This question is important in order to understand how far the different world views may contribute to the construction of the issue under consideration?

According to the wished degree of exploration, the balance between these two dimensions may be very different. If the objective is to “understand public understanding”, focus groups may be a good formula since they may integrate a wide variety of “world views” and because the framing effects are very limited<sup>15</sup>. However, in focus groups, the organisers do not expect much cross-learning effects and sociocognitive dynamics. If the objective is exploration, collective learning is a key issue. If the arrangement combines a high diversity of participants and weak framing effects, the construction of robust results is highly improbable because of weak consolidation effects (for a definition of robustness, see Box 2-2). On the other hand, with no diversity of participants and strong framing effects, the construction of robust results is also highly improbable because of weak articulation –and not because of consolidation effect–.

For sure, the characteristics of the pTA arrangements are very important in order to achieve the goals of the exercise. However, the performance also depends on external features. In some instances, the socio-technological trajectories are so irreversible that any process of alternative exploration would require huge research and development investments. Moreover, the practical possibility to organise the pTA experience is dependent on the state of socio-technical networks (STN). For instance, in situations where no alternative and/or independent scientific expertise is available, the discussion on socio-technical options may be reduced to the opposition between technology and moral values, with no possibility of fruitful articulation<sup>16</sup>. Therefore, the account of the characteristics of the technological trajectory and of the state of public debate is necessary in order to understand the role of pTA. This account is at the core of the ADAPTA project.

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<sup>14</sup> As shown in the EUROpTA project, political roles of pTA are more diverse. These political roles were considered as follows : (i) indirect role (promoting communication between science and the public, stimulating public debate, awareness building, raising sensitivity for method); (ii) Agenda setter, (iii) Exploration of objectives; (iv) Filter of policy alternatives; (v) "Blockade runner"; (vi) Implementation and evaluation of policies. As we adopt a perspective which focuses on "public action" rather than on "policy process", we won't use this linear analytical frame (see section 3).

<sup>15</sup> Typically, focus groups may be conducted without injecting expert knowledge. This allows to construct an exercise on the base of the world views of participants. Consensus Conferences are very different since the training period transforms the participants which become “informed lay-people”. Indeed, the framing effects of this latter arrangement are more important. However, as learning in pTA is a cross-arena learning, with input from all arenas, the influence of specific positions and interests may be limited.

<sup>16</sup> The French electro-nuclear programme developed in the 70s offers a good example of the impossibility of democratic debate because of a monopolisation of the scientific and technical expertise Nelkin, D., Pollak, M., (1981). The Atom Besieged. Antinuclear Movements in France and Germany. Cambridge, MIT Press..

### **Box 2-2. Learning effects associated with participation : the issue of robustness**

The kinds of learning that occur can be described in terms of *robustness*, a concept that describes features of outcomes of a controversy (articulation and consolidation). The achievement of robustness depends on two general requirements :

1. there must be a sociocognitive dynamic, that is, interaction between contending parties *and* problem definition. Otherwise, there will be no mutual articulation in the course of the controversy;
2. since articulation work requires additional effort, parties will not generally do so by themselves, and a forceful focus must be present, often provided by an external actor.

If these two requirements are not fulfilled, a controversy only produces specious inflation and reduction of claims, and no social learning can be expected.

*Source : adapted from (Rip 1986)*

## **2 - 2.2. Political acceptance of pTA**

As convincingly argued by Van Eijndoven, the development of consensus conferences in Denmark has been considered by many observers as a way to enhance democratic procedures through citizens involvement in policy process (Van Eijndhoven 1997). Therefore, in Denmark, the result of pTA is considered as an important and legitimate input for policy. Although such a view may be widely shared its effective acceptance has been problematic in many countries. For instance, Van Eijndoven reminds that consensus conferences were criticised in the Netherlands because they could circumvent the prerogatives of democratically chosen representatives. Therefore, in the Netherlands consensus conferences have been renamed "public debate" in order to clearly indicate that the final document provides an overview of laypeople's views rather than a consensus to which should be attributed a political meaning. The political acceptance of pTA is even worse in countries like France and the UK usually characterised as representative democracies where elitism and technocracy have traditionally a key role in technological choices<sup>17</sup>.

How pTA Is considered by the various actors of the public sphere? How does this form of deliberation interacts with other institutions? (...)

These are key questions which the "political dimensions of pTA" aim to address. pTA can be considered as a "virtual world" constructed in order to examine problems and solutions. The issue is to know to what extent -and how- social actors who do not participate in the pTA exercise will re-appropriate what is produced in such a frame.

In their review of pTA arrangements, Rowe and Frewer, name this political dimensions "acceptance criteria" (Rowe 2000). They propose to look at the features of the method that make it acceptable for a wider public :

- . Criterion of representativeness ("the public participants should comprise a broadly representative sample of the population of the affected public")
- . Criterion of independence ("the participation process should be conducted in an independent, unbiased way")
- . Criterion of early involvement ("the public should be involved as early as possible in the process as soon as value judgement become salient")

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<sup>17</sup> Interestingly, in both countries (as in many other countries), consensus conferences have been set up for the first time in order to discuss the use of GM crops. We provide an explanation for this in Marris, C., Joly, P.B., (1999). "Between consensus and citizens: Public participation in Technology Assessment in France." Science Studies 12(2): 3-32..

. Criterion of influence ("the output of the procedure should have a genuine impact on policy")

. Criterion of transparency ("the process should be transparent so that the public can see what is going on and how decisions are made")

Although this criteria play an important role in the public acceptance of the results of the pTA the re-appropriation process also depends on the state of the public debate. Therefore, it is necessary to catch how the various actors involved at different levels in a pTA exercise argue on this point and - eventually- refer to such criteria<sup>18</sup>. It is also to capture the actual influence of the exercise on the views and positions of some actors and the way the actors refer to it. This is the originality of the analytical perspective of the ADAPTA project which focuses on the external interactions of the pTA rather than internal features.

## **2 - 3. THEORETICAL FRAMEWORK : ARENAS, PUBLIC DEBATE, TECHNOLOGICAL TRAJECTORIES AND PUBLIC ACTION**

For sure, the move toward pTA is to be related with the expression of a will to open the discussion and/or the process of construction of technological options to a wide range of social actors. In some ways, pTA exercises are new types of relations between science and society which rely on the broadening of the collective learning processes involved. In the frame of the ADAPTA project, the choice has been made not to consider formal pTA as the only way to achieve this goal, but also to take into account other forms of formal and informal dialogue processes. This choice has two main reasons :

. former studies on socio-technical controversies have argued convincingly that public controversies may be considered as informal technology assessment processes. Such studies show that these controversies are not just confrontation between scientific expertise and non scientific. At the contrary, controversies spaces usually oppose different conceptions of science and technology (Callon ,1981, Rip, 1986, Cambrosio and Limoges, 1991)

. the possibility to integrate various forms of public participation, including stakeholders initiatives, NGOs mobilisation, media coverage, direct actions,... offers a way to construct an analysis which takes advantage of the variety of socio-political contexts represented in the 6 countries under study. This results from pragmatic as well as more theoretical reasons. On one hand, not all the countries have experienced formal forms of pTA. On the other hand, even in some countries where pTA has been experienced, the relevance of this experience may be uncertain. Therefore, adopting the perspective of the formal pTA to analyse these situations would result in a view which would not give an accurate account of the role of pTA in such socio-political context. It is therefore necessary to develop a symmetric analysis of pTA and Public Debate (the latter reflecting any other formal or informal dialogue process in society than formal pTA).

The first difficulty in keeping a balance approach of pTA and Public Debate is the lack of common definition of the latter concept. Public Debate is commonly considered as either -negatively- what

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<sup>18</sup> According to the pragmatic perspective adopted in our project, we do not check if the actors refer to such a pre-determined list of factors. Instead, we have to follow how the actors argue their position and eventually refer to this type of factors. Note that the EuropTA project identified three types of factors influencing the political role of pTA –from the comparative analysis of 16 arrangements in 6 countries-. These factors have some common ingredient with the list of Rowe and Frewer but still differ : (i) factors associated with the societal context (good timing with the public controversy, good timing with de facto policy making, political relevance of the topic, political culture open for –informal- participation); (ii) Factors associated with the political context (link to the political sphere, Credibility and reputation of the institution); (iii) Factors related to the property of the arrangement (precise definition of the 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).

circulates in the media or -positively- as free dominant discourse like in an idealistic view of the Greek Agora.

We refer here to the notion of *public debate* as a set of exchange of viewpoints and/or social confrontations which may include discussions and deliberations in formal processes (ethical committees, ...) as well as informal ones (protests, demonstrations, direct action, media coverage,...) Thus, public debate may be considered as a long process which allows expression and discussion of different worldviews and which favours social understanding of given issues through collective learning processes. In this perspective, in order to go beyond usual sketchy views of public debate (which oppose on one hand a reduced view of the media as the only public arena and, on the other hand, a uniform public space), it is necessary to refer briefly to a theory of social organisation<sup>19</sup>. Mass public societies are highly segmented and this segmentation conditions the way one can take voice and the modes of justification of the various conflicting positions. Let us consider the concept of *arenas* which is used in political sciences to design symbolic spaces of confrontation<sup>20</sup> which influence collective decisions and public policies<sup>21</sup>. Several elements characterise the arena concept<sup>22</sup>:

- (1) the rules of access to the arena and the type of arguments and resources (money for the economic arena, power for the political one, scientific proof, reputation,...) which can be used. Thus, arena are characterised by "dominant actors" (Cf. Table 2-3). For instance, it will be very difficult to argue in the scientific arena for actors who are not scientists. Also, each individual actor may have different identities according to the various arenas : in the economic arena, we expect to observe an identity of consumer, as the identity of citizen will be present in the political arena (etc.) ;
- (2) the conditions which determine the type of confrontation between actors, their interactions with wider audiences, and the way disagreements or conflicts are handled and eventually solved, according to "symbolic referentials".

The main features which characterise the arenas are given in table 2-2.

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<sup>19</sup> This analytical frame has first been designed in a parallel study in process Joly, P. B., Marris, C., Marcant, O., (2001). Plantes et aliments transgéniques comme "problème public" : la controverse sur les OGM et ses incidences sur la politique publique aux Etats-Unis. Grenoble, INRA, Rapport pour le Ministère de l'Agriculture, DPEI. It has then been further developed within the Adapta project.

<sup>20</sup> Symbolic space means that arenas are neither geographical entities nor organisational systems.

<sup>21</sup> These are symbolic spaces since there may not have a specific geographic or institutional localisation.

<sup>22</sup> Our approach of the arena concept has to be related to various sources, mainly : Dodier, N. (1999). "L'espace public de la recherche médicale. Autour de l'affaire des ciclosporines." *Réseaux* 95: 109-154., Renn, O. (1992). The social arena concept of risk debates. *Social theories of risk*. G. S. Krinsky, D., Westport, Praeger., Dobry, M. (1992). *Sociologie des crises politiques*. Paris, Presses de la Fondation Nationale des Sciences Politiques.. We also use the concept of "configurations" proposed by Chateauraynaud and Torny and which characterises the type of resources (rhetoric, arguments, ...) which the actors use in order to make their point according to the various situations Chateauraynaud, F., Torny, D., (1999). *Les sombres précurseurs*. Paris, EHESS.. Note that the concept arena is used for the biotechnology area in Bauer, M., Durant, J., Gaskell, G., (1998). Biotechnology in the public sphere : a comparative review. *Biotechnology in the Public Sphere*. B. J. Durant, M.W., Gaskell, G., London, Science Museum: 217-227.. But the authors do not relate it explicitly to public debate.

**Table 2-3. The concept of arenas: general characteristics**

Arena	Setting	Resource <sup>23</sup>	Symbolic referential	Deviations	Dominant Actors <sup>24</sup> and specific identities	Productions
Economic	Market	Money Image	Efficiency, transactions	Domination	Producers Consumers	Products
Scientific	Laboratory, Scientific institutions (Expert committees)	Scientific proof, method, reputation	Truth, Rationality, Rigour, Impartiality	Lack of rigour, Fraude	Scientists, Experts, Lay people	Knowledge Expertise
Regulatory	Agencies, authorities	Rules, codes, procedures	Control, independence	Corruption	Experts, Regulators Producers	Regulations Norms
Legal	Courts of Law	Laws, procedures	Justice	Partiality Judicial error	Legislator Judges, Lawyers	Jurisprudence
Political	Parliament Street	Power, trust	Democracy	Autism Private interest	Politicians, Citizens	Laws, R&D trajectories
Religious	Church	Religious texts, Traditions	Absolute truth	fanatism	Priests, Laity	
Media	Newspapers, TV, radio	Audiences, sources	Information, Truth, Freedom of speech Truth	Simplified "storyline" Scoop, Lies	Journalists Audiences	Media stories, emotion, awareness, Scandals

Within a policy field, several arenas may exist in which actors have to be present in order to influence the policy process. As shown by various theories on public mobilisation, the framing of a given issue is very much associated to the social form of the public debate<sup>25</sup> -and therefore in our terms to the kinds of arenas within which the confrontations take place-; to some extent, the context and the content of the debate are co-determined and have to be analysed as such<sup>26</sup>. Accordingly, the construction of the cognitive (what is the problem about?), normative (which general principle conditions the decision?) and pragmatic (How can we decide? Which are the instruments?) dimensions of a given issue is very much related to the type of arena within which controversies and debate take place.

<sup>23</sup> Although particular resources are attributed to each arena, an important aspect of this approach is to analyse the ways in which the same resource (e.g. money or scientific proof) is used *differentially* in different arenas, and how these resources circulate between different arenas.

<sup>24</sup> "Resident" actors in the arena in non-controversial periods.

<sup>25</sup> We refer here inter alia to the theory of agenda setting (Cobb, R. W., Elder, C.D., (1983). Participating in American politics : the dynamics of agenda-building. Baltimore, John Hopkins University Press., Hilgartner, S., Bosk, C.L., (1988). "The rise and fall of social problems : A public arenas model." American Journal of Sociology 94(1): 53-78.) and to the theory of mobilisation (Snow, D. A., Rochford, E.B., Worden, S.K., Benford, R.D., (1986). "Frame alignment processes, micromobilization, and movement participation." *Ibid.* 51: 464-481.). For a recent discussion of these approaches, see Joly, P. B., Marris, C., Marcant, O., (2001). *Plantes et aliments transgéniques comme "problème public" : la controverse sur les OGM et ses incidences sur la politique publique aux Etats-Unis*. Grenoble, INRA, Rapport pour le Ministère de l'Agriculture, DPEL..

<sup>26</sup> The reader may recognise in this sentence one of the results of the analysis of public controversies by Limoges and Cambrosio Limoges, C., Cambrosio, A., Anderson, F., Pronovost, D., Charron, D., Francoeur, E., Hoffman, E., (1993). "Les risques associés au largage dans l'environnement d'organismes génétiquement modifiés : analyse d'une controverse." Cahiers de recherche sociologique 21: 17-52..

Based on this arena frame, two main tools may be proposed in order to analyse the interactions between public debate and policy process.

### **2 - 3.1. A typology of public debate**

Based on the intensity of trans-arena interactions, we propose to distinguish different types of public debate and to define a qualitative scale :

. "A" is for no debate on the issue at all, in any arena

. "B" is for a debate which is mainly confined within a small number of specialised arenas, for instance, the scientific and the legal ones. Controversies, conflicts and negotiations remain within the confines of individual arenas, with very few interactions between the arenas. This corresponds to a "business as usual" situation where the problem is dealt in a "normal" way. The network of government bodies in charge of the problem and a few stakeholders involved is stable and the definition of the issue (what is the problem at stake? What are the solutions?) is not controversial.

. "C" is for a debate which involves a greater number of arenas and a greater interaction between the different arenas. Actors begin to move into arenas in which they are not usually "resident", and this can sometimes open up the opportunity for a challenge to the established frames of reference, or "symbolic referentials", of specific arenas. This corresponds to a "managed tensions" situation characterised by intensive controversies on the definition of the problem and solutions. The controversies space destabilises the network of government bodies in charge and stakeholders traditionally involved. Actors who mobilise set the issue in various arenas and open new strategic opportunities for resident actors in the respective arenas. This destabilising process contributes to the amplification of the problem;

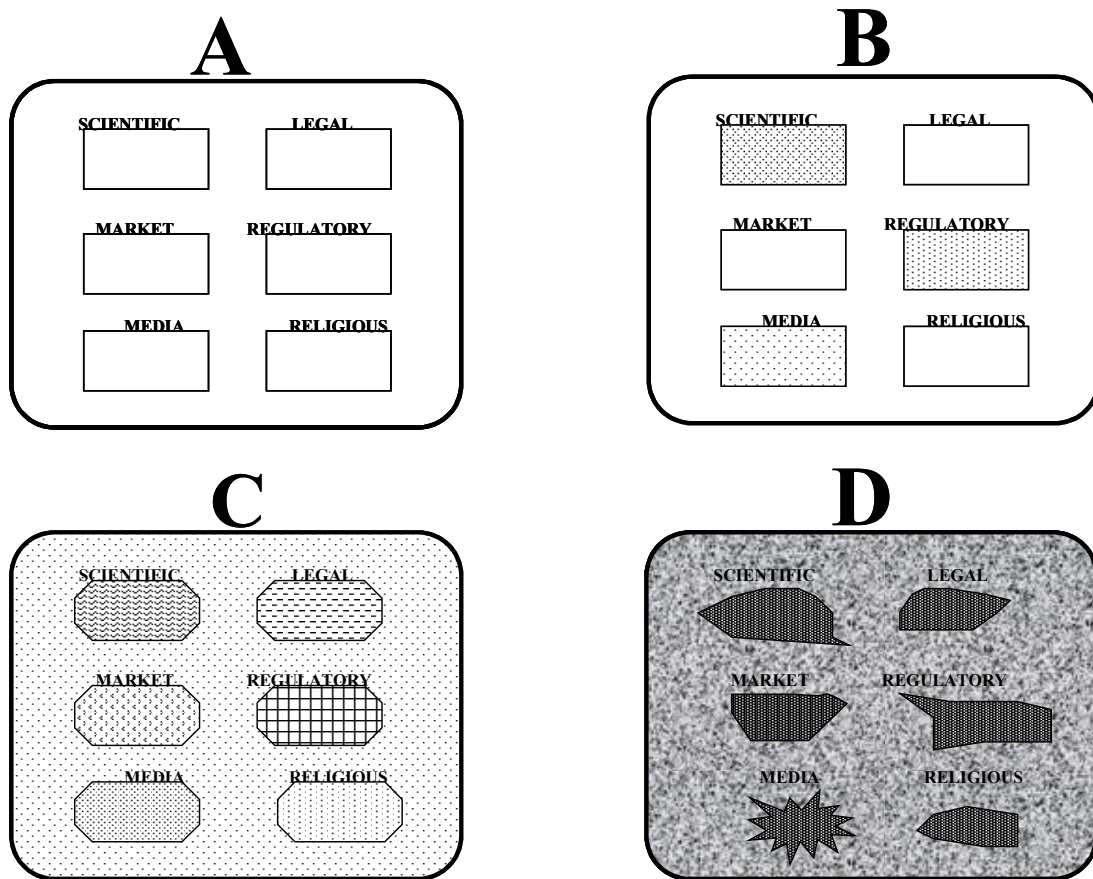
. "D" indicates that the fundamental characteristics of most of the arenas, including the type of actors present and the frames of reference used within each of them, have been significantly influenced by the dynamics of the public debate. This corresponds to a "crisis" situation since the controversy on the specific issue is globalised and may become a serious problem for existing institution. In terms of political process, actors of the social mobilisation may become as influential as the traditional stakeholders

In this descriptive model the "public opinion" does not exist at all as a discrete entity (the "media" arena should definitely not be seen as a substitute for it). The "public opinion" is in a sense a "phantom" which runs throughout the model, constructed and utilised as a resource by different actors, in different ways, in the diverse arenas<sup>27</sup>. The society can be seen as the combination of all the different arenas - including the spaces between them<sup>28</sup>-. Thus, when one moves from A to D, interactions between the arenas increase and the debate can be seen to "overflow" from the arenas: the gaps between the arenas begin to be filled also. Thus in the situation described by A to B, the gaps remain blank, but as one moves up the scale, they begin to fill up progressively.

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<sup>27</sup> Again, the similarities with the approach of Limoges and Cambrosio has to be pointed out (Cambrosio, A., Limoges, C., (1991). "Controversies as governing processes in technology assessment." *Technology Analysis and Strategic Management* 3(4): 377-396., Limoges, C., Cambrosio, A., Anderson, F., Pronovost, D., Charron, D., Francoeur, E., Hoffman, E., (1993). "Les risques associés au largage dans l'environnement d'organismes génétiquement modifiés : analyse d'une controverse." *Cahiers de recherche sociologique* 21: 17-52.). They consider that "public opinion is a resource constructed and mobilised by strategic actors in public controversies". However, as they do not use explicit definition of arenas and public sphere, they are to some extent limited in their analytical development.

<sup>28</sup> According to political theory, "public sphere" is the space between arenas



**Figure 2-2. A typology of Public Debate in the arena model**

This way of describing and analysing "public debate" or "public controversy" gives us an unusual angle for approaching the question "is there a public debate?", "how intense is the public debate?". It focuses on a description of the dynamics of the interactions between the actors (hence the need to "follow the actors" as they move - or not - from one arena to another, and while they learn - or not - how to use and/or modify the frames of reference used in the arena they enter into). Thus we can look at what are often considered to be *indicators* for the intensity of "public debate" as *results* of the dynamics we describe.

Thus, "A" does indicate "no debate". When one moves from A to the situation described by "B" the debate only involves a few professionals which handle the problems raised according to the rules which are specific to the separate arenas. It hardly enters the media or the "public sphere" between the arenas. "C" reflects a debate which begins to enter the public sphere space in between the arenas, and is reflected in greater media interest and changes in opinion polls. New or unusual types of public expression may arise which do not fall neatly within the space and rules of any one arena, such as direct action, broad demonstrations, field trials destructions, lobby on school canteens, monitoring of the food industry (for instance, publication of the "black list" by Greenpeace<sup>29</sup>). In such a state, the debate becomes "trans-arena", but the debate involves mostly NGOs which represent organised social movements. When one moves into the situation described by "D", media coverage is high and the non-

<sup>29</sup> This type of action mixes the identity of consumer associated with the economic arena with the identity of citizen associated with the political arena.

organised mass public becomes enrolled: everybody has heard about the issue and has something to say about it. As quoted in the UK case :

*“I think if you ask a London cabbie, they’ll have an opinion [about GM food]. Everyone has an opinion now, that’s the point.” (Nov 99. Director of an NGO promoting organic food and farming)*

## **2 - 3.2. The degree of openness of socio-technical trajectories**

This new approach of public debate allows to shed a new light on the characteristics of socio-technical trajectories. We propose to characterise socio-technical trajectories by a degree of openness<sup>30</sup>. Openness is a function of the diversity of actors who are involved in the technological development and in the innovations processes.

In order to better elaborate the concept of openness, let’s turn to the Actor Network Theory (ANT). One of the key ideas is that any innovation process may be characterised by the dynamics of a socio-technical network (STN) which describes the “world” that such a process mobilises. It is a STN since it relates social as well as technical entities. In our arena model, these networks are inter-arena since they involve actors which belong to different fields (scientific, economic, as well as regulatory and seldom political). According to their structure, such networks determine trajectories which are more or less irreversible and thus more or less opened for the exploration of new technological options. As shown by Callon, as far as irreversibility is concerned, it is sufficient to consider two extreme situations (Callon 1995).

On one hand, technological trajectories may have a very high degree of irreversibility. In this case, the evolution is quite predictable and it is very difficult to design alternative options<sup>31</sup>. The irreversibility of trajectories is the result of a strong cumulativeness in the evolution of the network. Both internal transformations (learning processes) and extension (recruitment processes) which take place reinforce the similarity of the different parts which compose the network. The actors which form the network are more and more like the other actors in the network; as stated by Callon, the different parts of the network are equivalent and each speaks for the others. The boundaries between the network and its “environment” are reinforced and the network breaks away from its context. The production of norms and standards contribute to a strong alignment of actors and techniques and they reinforce the trend toward irreversibility.

On the other hand, in opened networks, the recruitment process may conduct to the entry of new very different actors or entities. These actors may wish to re-negotiate the objectives of the innovation process and contest some implications on social, ethical or political grounds. If the flow of entry is constant, the level of heterogeneity of the network may remain rather high over long periods of time. In such trajectories, the overflow is the rule. All options remain opened, but a very few technical constructions take place because of the high instability.

Of course, these extreme situations are very rare. In real world, we observe intermediate situations which are characterised by a mix between framing and overflow (Callon 1997) :

. an irreversible trajectory is characterised by a strong framing (strong boundaries, strong similarities of the entities of the network) and very weak possibilities of overflow. Therefore, the rhythm of technological progress is rapid but the degree of diversity is low;

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<sup>30</sup> Note that our use of “openness” differs from the standard use in a political science context. Here, we refer to ANT where openness is a property of the socio-technical network.

<sup>31</sup> Economists of technological change have used the term “lock-in” to qualify such situations where alternative technological options could be of interest but are not actually possible because of the strong irreversibility of socio-technical networks (network externalities, scale economies, ...).

. an opened trajectory is characterised by a high level of overflow. As a result of the heterogeneity and the openness of the STN, many options may be negotiated and explored. However, the degree of socio-technical construction is rather weak.

What is at stake in the integration between science and society is to develop STNs which sustain technological trajectories with a good balance between framing and overflow.

The analysis developed by Callon at a micro-sociological level<sup>32</sup> can be used at a more macroscopic level, provided that we make the link with our arena model. In this latter model, we represent the society as a set of inter-related arenas. Each arena is characterised not only by individual actors, but also by networks which are more or less homogeneous. A STN which characterises a given technological trajectory is an inter-arena network which connects more or less intensively various parts of the arena's networks. This projection of STNs within the arena model is to some extent a way of linking a local and constructionist analysis with a more structural one. At the difference with the ANT which considers that the attributes of an identity is defined by its position in a STN, we state that it depends also of its location within a given arena. Therefore, in order to characterise the STNs, it is important to take into account two key elements :

. the number and the intensity of links between the different arenas;

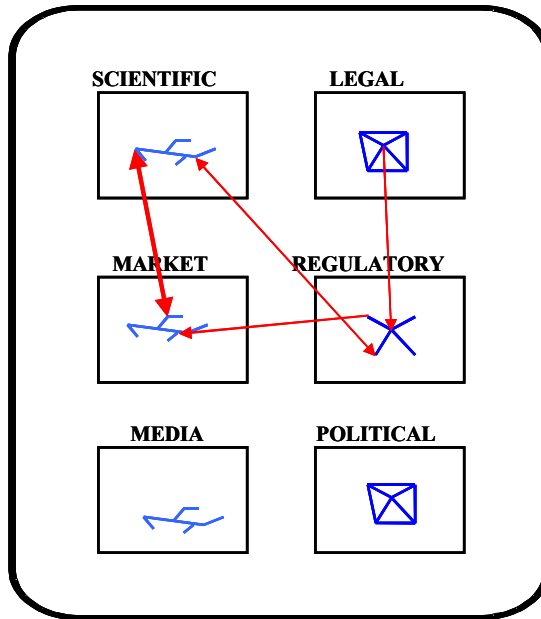
. the way the different arenas are connected through the STN. This element is dependent on the morphology of the networks in a given arena for a given technology. If the network is quite convergent and homogeneous, it may be correctly represented through any of its entity. The French electronuclear programme in the 70's is a well known example of such a situation where the strength of the STN relies on the high convergence of the networks in the various arenas (scientific, economic, regulatory, political,...). In this case, the trajectory is highly irreversible since the dynamics of the network conducts to a very strong closure process in the various arenas, including the political one. If the network are very heterogeneous and polarised, this is not the case. For instance, it may happen that, in the scientific arena, different disciplines –or even different paradigms within one discipline– have divergent views on the nature of the problems and solutions. In the economic arena, it may happen that the interactions between innovators and users are very weak and that the design of innovation rests upon a narrow range of lead users and does not integrate the visions of the world of the various stakeholders. In such a case where the various arenas' networks are heterogeneous and polarised, the STN may relate only some parts of these networks. It may also happen that they are several competing networks, (etc.).

This projection of the STNs in the arena model may be represented as follow (Figure 2-3). It allows to characterise the technological trajectories in “normal” states in the same frame as the one which has been proposed for the analysis of public debate. In this perspective, we state that the ways in which public debate will develop as trans-arena interactions has to be considered in the light of the inter-arena interactions within the technological trajectories. This analytical continuity between “normal”<sup>33</sup> situations and public debate is important, as claimed in the sociology of crisis (Dobry 1992).

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<sup>32</sup> Callon uses extensively the example of the Association Française contre les Myopathies (AFM) –a French patient's association very active in the field of human genetic research- to present the concept of “hybrid forum”.

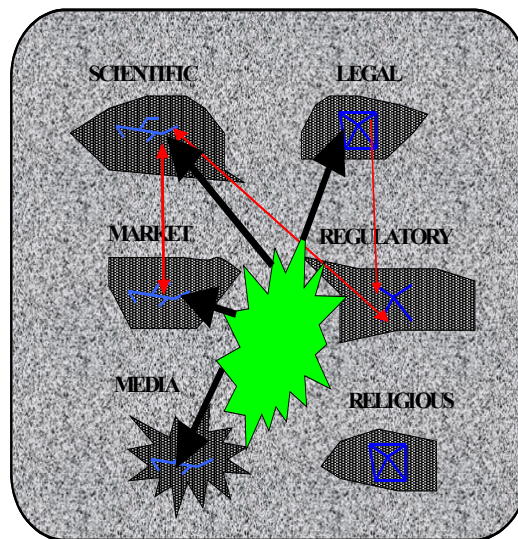
<sup>33</sup> “Normal” refers here to the kuhnian idea of “normal sciences”, which involves cumulative development in a given paradigm and which is opposed to revolutions.



Legend :

- . arenas' networks are represented in each arena
- . the main inter-arena interactions associated to the normal trajectory of the STN are represented by the arrows

**Figure 2-3. Socio-technical networks in the arena model –Situation B**



Legend and explanation:

- . The new arrows represent the trans-arena interactions. These arrows create new relations between various arenas. These relations overflow the previous STN.

**Figure 2-4. Socio-technical networks in the arena model –Situation D**

Situation A means no development of the technological trajectory; situation B means a “normal” development; situations C is a situation of public controversy where the “normal” regulations of the trajectory are contested but still prevalent; situation D is a general and wide contest of the regulations

of the trajectory and it is highly probable that they will lead to the exploration of new alternatives in the STNs dynamics. A representation of situation D is given in Figure 2-4.

Such an analytical frame allows to shed a new light on the “policy process”. In our perspective, the policy process does not refer to an independent process of design and implementation of public policies. To some extent, the policy process is embedded in the socio-technical network. As stated at the end of section 2, in the case of a very convergent and homogeneous network, it may happen that the policy options are just reduced to one possibility : follow up and accompany the pace of the technological trajectory, because it is not possible to think of alternative options. Indeed, in “normal” situations, policy options are a component of the STN. According to its structure, they may be more or less opened. Therefore, such a perspective refers to a *theory of public action* where policy options depend on the state of the STN and not only to the political arena nor to the governmental agencies.

## 2 - 4. INTERACTIONS BETWEEN PTA AND PUBLIC DEBATE

The analytical framework which has been exposed so far has been developed in the course of the present project. At this point, it is important to explicit the context of production since this has some key implications for understanding the status and use of such a framework :

1. at the beginning of the project, our intent was to use the ANT in order to analyse the interactions between pTA and Public Debate. From the ANT, we retained and adapted a methodological standpoint: “follow the actors” and try to look at the problem through their own glasses. However, the project team found it difficult to look at wider socio-political processes, such as public debate, in the ANT frame since this theory mainly deals with the dynamics of techno-economic networks in the perspective of innovators<sup>34</sup>. Thus the reference to a political theory of the segmentation of the society which appears to be complementary with the ANT. As stated in the ANT –and many other social theories-, actors take their form and acquire their attributes as a result of their relations with other entities. ANT focuses on human-non human networks, their configuration and their dynamics. We also focus on the influence of the grammar of arenas and their influence on the construction of innovation through various ways to take into account resources (money, power, justice, scientific proof, ...). Indeed, ANT leads to focus on openness, closure and boundary effects. The perspective of the arena framework conducts to look at trans-arena interactions;
2. this analytical framework has been developed while the field work was performed and after completion of the cases. Although the field cases have been produced independently from this framework this latter was necessary in order to construct the transversal analysis. To some extent, the analytical framework has to be considered as an output –and not a single input- of the research project Therefore, we must underline the inductive characteristics of our methodology. Indeed, the various cases have their own intrinsic value and have been developed through “broader glasses” which are not fully taken into account in this analytical framework. Therefore, the analytical framework and the transversal analysis are not the full story of this project but an original and specific perspective on what has been produced.

In our analytical framework, we consider that a detailed characterisation of public debate and its relation with technological trajectories is necessary in order to understand the objectives and the effects of pTA. This driving hypothesis is the main originality of the Adapta project.

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<sup>34</sup> This explanation may appear a bit weak if we consider on one hand the expansion of the ANT in various field and perspectives Law, J., Hassard, J., Ed. (1999). *Actor Network Theory and After*. Oxford, Blackwell Publishers., including on the issue of technology and democracy (see Latour, B. (1999). *Politiques de la nature*. Paris, La Découverte. and Barthes, Y., Callon, M., Lascoumes, P., (2001). *La démocratie technique*. Paris, Seuil.). On the other hand, we cannot sum up accurately the discussions we had in the course of the project on the way to use ANT.

Therefore, in our analysis, pTA is considered as a local point in a social trajectory which is connected with : (i) a technological development path; (ii) the nature and form of public debate. Two key characteristic will influence our methodology :

1. pTA arrangements are strongly embedded in national contexts<sup>35</sup>. What we call national context is a mix of factors including : social context (socio-demographic features, associative movement, professional associations,...), institutional setting, and political culture (openness of decision process, tradition of participation, interactions of science and policy and boundary work). National context conditions both the dynamics of public debate and the design of pTA arrangements. Therefore, these arrangements may not be properly considered in an analytical frame which would deal with each factor as an independent variable (*ceteris paribus*). Instead, they have to be considered as singular events which have to be analysed in a more holistic way. Obviously, pTA posits at the core of socio-political issues and process. Thus, it is not sound to consider that the Danish consensus conference model may be transposed to France or the UK since that would imply too much changes in the national context overnight. This does not mean that comparative analysis is not relevant. At the contrary, the forms of development of public debate and the actual arrangements of pTA may tell a lot on the national context. Therefore, the analysis of the links between national context and the actual design of the pTA arrangement on one hand, and its qualitative and quantitative impact on the other hand will be central. Also, as a team gathering researchers from various European countries, we have to take benefit from a reflexive stance which may feed the analysis. We ought to take advantage of the variety of the situations and of our own perception (or misperception) of these differences. In this perspective, it is meaningful to observe that in some countries it is very difficult to find pTA arrangements (say in Portugal) or than in other cases, the national research team considers that formal pTA have to be analysed in relation with various forms of direct action which trigger public debate, etc.;
2. Accordingly, our framework deserves close attention at the narrative of the initiation of the pTA arrangement : when was the pTA arrangement organised? how was it connected with public debate or policy process? who initiated? who participated? (...). In this perspective, pTA may be considered as pro-active or reactive. A pro-active pTA is viewed as a tool to associate lay people in early framing of public decisions; one expected effect may be to pacify the issue and then pre-empt public debate. Conversely, a reactive pTA may be organised with the intend to channel or redirect public debate and even in some cases, imposing already made decisions. However, the key point about the objectives is how they will be perceived by the various actors and how this perception will influence their actual participation. In this respect, the interaction between public debate and the pTA exercise are important. According to a very current interpretative scheme, the organisation of a pTA after the public debate has developed will be considered as a way to channel the debate or -worse- as a way to impose already taken decisions, whichever the actual and/or stated objectives may be. This is because, pTA will be considered as the response of policy makers to a perceived over-influence of some social actors (some interest groups, some stakeholders, the media) an the public opinion on the policy process<sup>36</sup>. The different ways to look at the objectives of a pTA (stated, intended, perceived, actual,...) lets an important place for ambiguity. We may imagine that this ambiguity will have a negative influence on the pTA acceptance since it will determine the way actors participate in the process and appropriate the results. Other studies have clearly established this point, showing that pTA acceptance is correlated to a political culture of participation and to a degree of institutionalisation of pTA. In the frame of our arena model, we will deal not only with the narrative of the setting up of a given pTA, but also with the analysis of the emergence of the pTA as a solution to given problems.

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<sup>35</sup> For a presentation of “National Contexts”, Cf. the specific reports annexed to this final report.

<sup>36</sup> It might be interesting to explore how this phenomenon is labelled in various countries. For instance, in France it is referred to it as "démocratie d'opinion".

It is also important to mention that within this project, we have not only looked at pTA but also at other formal or informal dialogue processes. This is because, as stated above, pTA is seldom –or even never- used in some countries. For instance, in some Genetic Test Cases, we have observed ethical committees.

Also, as stated above, the arena model allows to analyse public debate and pTA (or other formal dialogue process) in the same frame. Of course they are obvious differences : formal pTA is organised and strictly framed by an initiator and generally directly implies non involved lay people; public debate erupts as a the result of mobilisation of social movements and it implies more or less mobilised actors which claim to act as the "porte-parole" of parts of the society (consumers, environment, farmers, future generations,...). But what are the differences in terms of trans-arena work : what are the learning effects in terms of socio-technical articulation and in terms of robustness In this perspective, how can the trans-arena work be characterised? Are they strong boundary conflicts? Which actors activate the trans-arena work? How these moves challenge or fuel the policy process? What about the influence on the process of innovation? (...)

In the perspective of the arena model, it is also necessary to clarify the position of pTA in the public sphere. Is it a new arena? If not what is its place in the public sphere? Is it mainly attached to an arena or is it more independent/isolated?

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