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Author(s): Jurgen Ganzevles and Rinie van Est (editors).

Organisation name of lead beneficiary for this deliverable: Rathenau Instituut, The Netherlands

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PACITA Partners

Teknologirådet – Danish Board of Technology (DBT)

Toldbodgade 12, DK-1253 Copenhagen, Denmark,

Contact: Anders Jacobi

aj@tekno.dk

www.tekno.dk

TEKNOLOGI-RÅDET

Karlsruhe Institute of Technology (KIT)

Kaiserstr. 12, 76131 Karlsruhe, Germany

Contact: Leonhard Hennen

leonhard.hennen@kit.edu

www.kit.edu



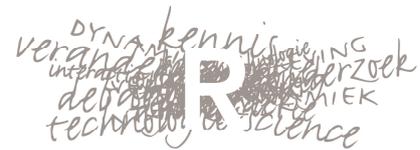
Rathenau Instituut (KNAW-RI)

Postbus 95366, 2509 CJ Den Haag, the Netherlands

Contact: Geert Munnichs

pacita@rathenau.nl/g.munnichs@rathenau.nl

www.rathenau.nl



Rathenau Instituut

Teknologiraadet – Norwegian Board of Technology (NBT)

Prinsens Gate 18, 0152 Oslo, Norway

Contact: Christine Hafskjold

Christine.hafskjold@teknologiradet.no

www.teknologiraadet.no



The Institute of Technology Assessment (OEAW/ITA)

Address: Strohgasse 45/5, A-1030 Vienna

Contact: Pacita-ITA team

pacita.ita@oeaw.ac.at

www.oeaw.ac.at



Applied Research and Communications Fund (ARC Fund)

5 Alexander Zhendov str., 1113 Sofia, Bulgaria

Contact: Zoya Damianova

zoya.damianova@online.bg

www.arcfund.net



**Instituto de Tecnologia Química e Biológica-
Institute of Technology of biology and chemistry (ITQB)**

Avenida da Republica, Estacao Agronomica Nacional, Oeiras, 2784-505, Portugal

Contact: Mara Almeida

marasilvalmeida@gmail.com

www.itqb.unl.pt/



Institute Society and Technology (IST)

Leuvenseweg 86, B-1011 Brussels, Belgium

Contact: Johan Evers

johan.evers@vlaamsparlement.be

www.samenlevingentechnologie.be



The Catalan Foundation for Research and Innovation (FCRI)

Pg. Lluís Companys, 23, ES-08010 Barcelona, Spain

Contact: Belén López

belen.lopez@fundaciorecerca.cat



**Fundació
Catalana per a la
Recerca i la
Innovació**

Swiss Centre for Technology Assessment (TA-SWISS)

Brunngasse 36, CH-3011 Berne, Switzerland

Contact: Danielle Bütschi

danielle.buetschi@ta-swiss.ch

www.ta-swiss.ch

Zentrum für Technologiefolgen-Abschätzung
Centre d'évaluation des choix technologiques
Centro per la valutazione delle scelte tecnologiche
Centre for Technology Assessment



Association Knowledge Economy Forum (KEF)

Galvydzio 5/96, LT-08236, Vilnius,
Lithuania

Contact: Edgaras Leichteris

edgaras@zef.lt

www.zef.lt



Technology Centre ASCR

Ve Struhach 27, 160 00 Prague 6

Contact: Lenka Hebakova

hebakova@tc.cz

www.tc.cz



Scientific and Public Involvement in Risk Allocations Laboratory (SPIRAL)

Boulevard du Rectorat 7/29, B31, 4000
Liège, Belgium

Contact: Pierre Delvenne

pierre.delvenne@ulg.ac.be

www.spiral.ulg.ac.be/



University College Cork (UCC)

Western Road, Cork, Ireland

Contact: Frederic adam

PACITA@ucc.ie

www.ucc.ie



Secretariat of the Hungarian Academy of Sciences (HAS-SEC)

Nádor utca 7, H-1051 Budapest, Hungary

Contact: Janka GAUGEZ

gaugecz.janka@office.mta.hu

www.mta.hu



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Executive Summary

This report describes and compares current practices of Parliamentary Technology Assessment (PTA) in Europe. In particular Austria, Catalonia (Spain), Denmark, Flanders (Belgium), Germany, the Netherlands, Norway and Switzerland are looked at. For each country or region, one actual project is included as a case study, which further illustrates the ‘nuts and bolts’ of daily practice. Overall, reporting is based on interviews, institutional archives, websites, earlier descriptions and expert judgement. In the concluding chapter, the comparative analysis is extended to organisations in Finland, France, Greece, the European Union, Italy, the United Kingdom and the United States.

The study is carried out as part of the PACITA research and action plan, under the umbrella of the European FP7. PACITA stands for Parliaments and Civil Society in Technology Assessment. It is a joint effort of experienced partners and newcomers to the field. The overall PACITA objective is to empower European member states with an interest in PTA to make informed decisions about institutionalising, organising and performing PTA. At the same time, PACITA is meant to stimulate reflexivity in regions and countries with established PTA organisations. In doing so, PACITA aims to improve the quality of knowledge-based decision making on science, technology and innovation in Europe.

“Parliamentary TA” is much broader than the label suggests

In this study, a new and open way of modelling TA, and in particular PTA, is developed. As the modelling does not take interaction with the parliament *a priori* as the main determinant of a PTA organisation, it is more open to a broader positioning of PTA in today’s governance structures. (Parliamentary) TA is modelled as an activity at the interplay between the parliament, government, science & technology, and society. (Parliamentary) TA acts as a ‘knowledge broker’ between these four spheres. Such interaction takes place on three (interconnected) levels: the institutional, the organisational and the project level.

Our study confirms all four societal spheres to be important for Parliamentary TA. The analysis of the dynamics on the institutional, the organisational and the project level reflects how connections to all the four spheres are being made. Even for organisations that are embedded ‘inside’ parliament, building and maintaining credibility towards the ‘outside’ spheres of science & technology, society and government is important. Recognising and enforcing demand outside parliament has already proved to diversify the financial basis for PTA organisations.

Five organisational models for Parliamentary TA disclosed

Our study discloses five organisational models for Parliamentary TA that are currently operational. The differences between the models are based on the relative involvement of either one of the four societal spheres: parliament, government, science and technology, and society. Model 1 reflects *mainly parliamentary* involvement in how the practice of PTA is organised. This model applies to PTA in Finland, France, Greece and Italy. Model 2 reflects a *shared parliament-science* involvement, which is the case for Catalonia (Spain), the European Union, Germany, the UK and the USA (for the Office of Technology Assessment, until 1995). For Model 3 entails a *shared parliament-science-society* involvement, applicable for Flanders (Belgium, until 2012) and Denmark (as of 2012). Model number 4 reflects a *shared science-government* involvement, being the case for Austria. In Model 5, involvement is shared between all four

spheres, labelled *parliament-government-science-society* involvement (the Netherlands, Norway, Switzerland and the USA (for the Government Accountability Office). All five models have different possibilities for addressing the work, at least partly, at parliament.

Common framework developed for reflecting on Parliamentary TA

The study has resulted in a common framework for reflecting on future prospects for Parliamentary TA within and beyond the scope of PACITA. This is done by giving an overview of issues on the levels of institutionalising, organising and performing PTA. Examples of relevant questions on the institutional level are: should institutionalised PTA stimulate public debate? How to maintain long-term political support for a PTA organisation? Organisational matters include, for example, funding schemes and the instalment of a board, panel, platform or steering committee. On the project level, relevant matters include which topics to choose, which stakeholders to invite and how to disseminate project results. The concluding chapter of this report reveals how different organisations deal with such issues, thereby making explicit much of the tacit knowledge within the European PTA community.

The outcome of the study is a common vocabulary that should facilitate mutual discussions between countries and regions. This common framework for reflecting on an organisation's contribution to knowledge-based policymaking in the field of science, technology and innovation may help to further develop existing institutions and to establish new ones.

Implications for new countries and regions

New Parliamentary TA organisations do not come out of the blue. The modelling, developed in this report, is helpful to make explicit the already available 'opportunity structure' for PTA in new countries and regions. It provides an open view to where the demand and ambassadorship for TA lies. Institutional structures already existing locally may well be capable of taking (Parliamentary) TA functions on board. In this respect, it is helpful that the open modelling with four spheres can easily be expanded towards other types of TA, such as TA that is mainly aimed at ministries or other governmental bodies (so-called Governmental TA) or TA mainly aimed at practices of research & development (Constructive TA).

In new countries and regions, proponents of (Parliamentary) TA can only benefit from such 'windows of opportunity' if they manage to connect the TA vocabulary to the discourses on the governance of innovation that are currently locally relevant. Though the principle of (Parliamentary) TA is highly appreciated by many stakeholders, it has proven to be soft selling at the same time. Public controversies with regard to science, technology and innovation offer windows of opportunity to increase the chances of (Parliamentary) TA becoming institutionalised.

Chapter 1 Introduction

*Jurgen Ganzevles, Rinie van Est (both Rathenau Instituut) et al.*¹

1.1 Background and aim of the study

This report describes and compares current practices of Parliamentary Technology Assessment (PTA) in Europe. It is a joint effort of all the partners in the PACITA project, including both organisations with and without much experience in Parliamentary TA. PACITA stands for Parliaments and Civil Society in Technology Assessment. It is a four-year research and action plan, funded by the European Commission Framework Program 7, under Theme SiS-2010-1.0.1 *Mobilisation and Mutual Learning Actions*. This report is one of the early results in the overall PACITA project.

The overall PACITA objective is to empower European member states and associated countries with an interest in PTA to make informed decisions about institutionalising, organising and performing Parliamentary TA. At the same time, PACITA is meant to stimulate reflexivity in regions and countries with established Parliamentary TA organisations. In doing so, PACITA helps to improve the quality of knowledge-based decision making on science, technology and innovation in Europe.

This report, within the PACITA context labelled as Deliverable 2.2, connected to ‘Task 2.1 TA Practices in Europe’, contributes to this overall objective by laying bare the political, strategic and practical choices that are involved in institutionalising, organising and performing Parliamentary TA.

1.2 Contribution to earlier studies on Parliamentary Technology Assessment

Technology Assessment (TA) is broadly defined as “a scientific, interactive and communicative process, which aims to contribute to the formation of public and political opinion on societal aspects of science and technology”.² Parliamentary TA is about policy-oriented TA activities, directed to the parliament, which are intended to live up to the requirements of the parliamentary decision-making processes.

In this study, we develop a new and open way of modelling TA, and in particular Parliamentary TA. Parliamentary TA is modelled as an activity at the interplay between parliament, government, science and society. TA in general, and especially PTA, acts as a ‘knowledge broker’ between these four spheres. Such interaction between (Parliamentary) TA and these four spheres occurs on three levels: the institutional, the organisational and the project level. This is explained further in Chapter 2, where we discuss the conceptualisation and positioning of PTA in more detail.

¹ Co-authors are, in alphabetical order: Frédéric Adam (University College Cork), Zsigmond Attila (HAS-SEC), Mara Almeida (ITQB), Marianne Barland (NBT), Danielle Bütschi (TA-SWISS), Zoya Damianova (ARC Fund), Pierre Delvenne (Spiral, Université de Liège), Ferran Domínguez (CAPCIT), Johan Evers (Instituut Samenleving & Technologie), Emiliano Feresin (TA-SWISS), Jon Fixdal (NBT), Katalin Fodor (HAS-SEC), Lenka Hebakova (Technology Centre ASCR), Leonhard Hennen (ITAS, KIT), Anders Jacobi (DBT), Ádám Kéglér ((HAS-SEC), Edgaras Leichteris (KEF, Lithuania), Lars Klüver (DBT), Ventseslav Kozarev (ARC Fund), Belén López (FCRI), Michael Nentwich (ITA-OEAW), Linda Nierling (ITAS, KIT), Paidi O’Reilly (University College Cork), Marie Paldam Folker (DBT), Walter Peissl (ITA-OEAW), Benedikt Roskamp (Spiral, Université de Liège) and Mahshid Sotoudeh (ITA-OEAW).

² Bütschi, D. et al. (2004). ‘The practice of TA; Science, interaction and communication.’ In: M. Decker & M. Ladikas (eds.) *Bridges between Science, Society and Policy: Technology Assessment – Methods and Impacts*. Berlin, Heidelberg, New York: Springer.

This new way of modelling builds forth on the modelling in existing literature. As it does not take the interaction with the Parliament *a priori* as the main determinant of a PTA organisation, it is open to a broader positioning of PTA in today's governance structures. In terms of ambassadorship, sponsorship and clientele, governmental spheres, for example, are also known to be important drivers for PTA organisations across Europe. In addition, the new modelling reveals, in more detail, the 'manoeuvring space' that organisations have within their institutional context, and, concurrently, the space in which TA practitioners can act on a project level, within their organisational context. This new approach is introduced in more detail in Chapter 2.

1.3 Interactive approach

This report is the result of an exploratory, interactive approach. All PACITA partners contributed to this mutual learning process, led by the 2.1 Task team, which consisted of the Rathenau Instituut (Netherlands), the Danish Board of Technology Foundation (DBT), the Karlsruhe Institute of Technology (KIT Germany) and Institute Society and Technology (IST Flanders, Belgium). Plans and interim results were discussed with all PACITA partners at the kick-off meeting in Copenhagen (30-31 May 2011), the consortium meeting in Brussels (7-9 September 2011), a two day workshop connected to the consortium meeting in Oslo (6-7 February 2012), the consortium meeting in Copenhagen (19-20 June 2012) and the virtual consortium meeting, held via video-conferencing, on 8 September 2012. Draft versions of plans, schemes and reporting texts were sent around for feedback. Participants performed updates of country and region descriptions, to account for changes that occurred during the course of the study.

The process took off with exploratory interviews in seven countries or regions with established PTA organisations: Catalonia (Spain), Denmark, Flanders (Belgium), Germany, the Netherlands, Norway and Switzerland. Interviews were held with politicians, NGO representatives and media professionals. All were questioned about their views on the governance of science, technology and innovation. This included reflections on the public debate and how to deal with public controversy. Staff members, such as directors, project managers and communication officers, either experienced or recently employed, were interviewed in a similar manner. In each of the countries and regions, at least five interviews were carried out (see Appendix B for an overview).

These interviews, together with the more theoretical reflections as discussed in Section 1.2, inspired the design of a reporting scheme, set up to describe the context and 'nuts and bolts' of Parliamentary TA in each of the countries and regions participating in PACITA. The actual chapters are not only based on the interviews; authors also consulted institutional archives, websites and earlier descriptions of PTA in each country or region. In this process of research and reporting, each PACITA partner who was experienced with TA was paired with one of the newcomers. The Austrian Institute of Technology Assessment (ITA) also took up the task of preparing a country description based on the same reporting scheme, although it did not have any contractual obligations within the context of PACITA Task 2.1 to do so. This resulted in eight comprehensive descriptions of TA institutes in each of the studied countries and regions, fully integrated in this report as Chapters 3-10.

These chapters report on the relevant dynamics on the institutional, the organisational and the project level. For each country or region, such dynamics have been exemplified further by a case study. Table 1.1 gives an overview of the case studies, illustrating the diversity in topics and methods deployed in Parliamentary TA across Europe.

It is important to realise that the PTA landscape in Europe is broader than the eight countries and regions that are described in-depth in this report. This has also analytical consequences, since the sample of eight organisations does not fully cover the great organisational variety found in practice. Mainly due to institutional constraints, Parliamentary TA organisations in Finland, France, Greece, the European Union, Italy and United Kingdom are not official partners within PACITA. As a consequence, the work of Parliamentary TA in these countries and regions could not be described in detail. In the concluding Chapter 11, however, we tried to overcome this shortcoming: where illustrative and doable, the analysis was extended to additional practices of Parliamentary TA. Existing literature was used, backed up by a number of experts and representatives from those organisations.

Throughout the concluding Chapter 11, the dynamics within the different countries and regions are compared. This leads to an overview of options for institutionalising, organising and performing PTA. In doing so, we built up a framework for reflecting on PTA. This creates common ground for discussing future prospects for PTA within and beyond the scope of PACITA.

Part of chapter	Country or region	Case study	Examples of methods used
2	Austria	Technology and autonomous living	In-depth interviews with end users of ICT
3	Catalonia (Spain)	Genetically modified organisms	Parallel research by different organisations
4	Denmark	Future energy systems	'Future panel' with decision makers from politics, industry and civil society
5	Flanders (Belgium)	Digital inclusion	Technology Festival for mixed activities with lay public, experts, civil society professionals and policymakers
6	Germany	Large-scale outage in the electricity supply	Thorough expert consultation
7	The Netherlands	Global trade in human biological material	Strong media campaigning strategy
8	Norway	Online gambling	Open start-up conference for broad set of experts and stakeholders
9	Switzerland	Anti-ageing medicine	Use of PubliTalks: student discussions, starting from one personal story

Table 1.1 Overview of case studies in this report

Chapter 2 Positioning and conceptualising Parliamentary TA

*Rinie van Est and Jurgen Ganzevles (both Rathenau Instituut) et al.*³

2.1 Introduction

Technology assessment (TA) involves an awareness about potential positive and negative societal effects of technological change, as well as the belief or hope that one can anticipate on these effects (cf. Rip 1986). TA is not a separate field of scientific research, nor is it a well-defined practice (Grunwald 2009). Many scientific disciplines – from policy analysis, risk assessment to ethics and cultural studies – have influenced the way TA is understood, institutionalised and performed.

TA can play a role in different social and institutional contexts and it can be directed towards various target groups. Figure 2.1 shows four major social spheres that together, at least to a large extent, define the institutional environment in which a TA organisation performs its tasks. The various spheres or poles (Callon et al. 1992) can be distinguished both by the actors constituting them as well as by the types of products and processes these actors create and manage. Within the science and technology sphere, certified scientific knowledge is produced, as well as technological artefacts. The main actors within this sphere are scientists and technologists, working within universities, public or private research centres, and high tech firms. The societal sphere corresponds to the world of the citizen as a user of technology and as someone who experiences the benefits and risks of technological change. Actors within this sphere are civil society organisations, such as employer organisations, trade unions, and environmental organisations, but also individuals and groups of citizens. The parliamentary sphere relates to the parliament, its procedures, its culture and routines, and the people working there, that is, the members of parliament (MPs), and also the clerks. The Parliament controls the government and makes democratically legitimised political decisions. The governmental sphere relates to the machinery of the government, including the civil servants working there. Public policies are developed and implemented in this sphere. Within this context, TA can take place on various administrative levels: European, national, regional, and municipal.

Actors from each of the abovementioned societal spheres are potential clients of TA, for example, scientists and engineers. In that case TA can be used as a means to guide research and technology development from a societal perspective. The term constructive technology assessment is regularly used to pinpoint TA that is aimed at influencing technological choice and design processes (Schot and Rip 1997). Policymakers are also potential clients of TA. The task of TA is then to inform policymakers about the societal aspects of science and technology. TA activities can also be aimed at the general public in order to stimulate the public debate on science and technology in society. Finally, TA can be directed towards members of parliament. This is

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called Parliamentary TA, that is, “technology assessment specially aimed at informing and contributing to opinion formation of the members of parliament as main clients of the TA activity” (Enzing et al. 2011: i). The PACITA project focuses on the latter form of TA, Parliamentary TA, which is directed at elected parliamentarians. PACITA partners are TA organisations that work on the national or regional level.

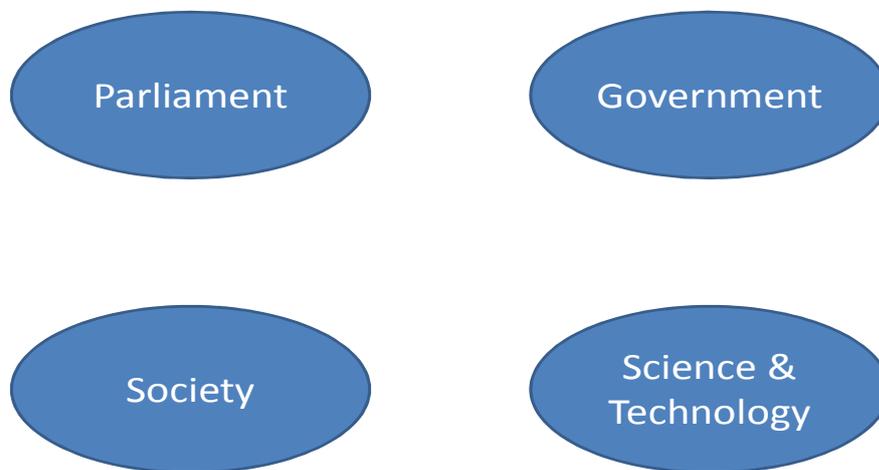


Figure 2.1 Four societal spheres constituting the institutional context of TA organisations

The political nature of Parliamentary TA is central to this analysis. Parliamentary TA plays a (politically legitimised) role in the democratic decision-making process on the governance of science and technology in society (Van Est & Brom 2012). Democratic politics can be said to depend on ‘puzzling’, ‘powering’ and ‘participation’ (Hoppe 2010). Puzzling is about “how well founded or convincing the problem claims are, and a judgement to whether government can make a difference” (Hoppe 2010, 18). Powering is about “whether sufficient pressure and influence can be mobilised for a problem claim to get proper attention” (ibid) within the political system. Finally, participation concerns “who is included or excluded from having a voice in the puzzling; and whose resources and connections create what weight and influence in the powering” (ibid). It follows that an organisation that performs Parliamentary TA is provided a rather privileged political position within the political system. Namely, it is given resources to partake in the puzzling, and it is given the institutional task to participate in the political decision-making process, thus to influence that democratic process. The way in which Parliamentary TA is institutionalised thus enables the related TA organisation to have an impact on the political debate. Simultaneously, that same institutional context will constrain the way in which that TA organisation may perform its activities.

This study aims to clarify how Parliamentary TA has been and can be institutionalised, organised, and performed. It does so by analysing a limited number of existing institutional contexts and practices in which Parliamentary TA is being performed. The report takes a closer look at Parliamentary TA practices in Austria, Catalonia (Spain), Denmark, the European Union, Flanders (Belgium), France, Germany, the Netherlands, Norway, the United Kingdom and Switzerland, however, with in-depth studies for only eight of these countries. The PACITA project aims to empower European member states with an interest in Parliamentary TA to make informed decisions. This work package tries to contribute to this overall objective by laying bare the many political, strategic and practical choices involved in institutionalising, organising and performing Parliamentary TA. Such an effort may enable those countries to decide whether or not they are in need of Parliamentary TA, and to gain an understanding of how to strengthen the current ways in which they deal with societal issues surrounding science and technology.

This chapter aims to provide a conceptual framework that clarifies the set of choices that shape, enable and constrain the practice and performance of Parliamentary TA. In order to get a first good impression of the relevant parameters in play, section 1.2 will describe some existing ways of characterising Parliamentary TA. Elaborating on those earlier studies, a framework is introduced to describe and analyse institutionalising, organising and performing Parliamentary TA.

2.2 Key characteristics of Parliamentary TA

In different European countries Parliamentary TA is institutionalised in different ways (cf. Bimber & Guston 1997, Vig & Paschen 2000, Falkner et al. 1994). In the literature on TA, several attempts have been made to characterise Parliamentary TA and to group distinct patterns of doing Parliamentary TA. This section tries to identify and group the key parameters that have been used in the literature to characterise Parliamentary TA. First, focus is laid on one of the latest attempts to sketch the European (Parliamentary) TA landscape and to characterise various institutional forms of Parliamentary TA, which was undertaken by Enzing et al. (2011), building forth on, amongst others, Hennen and Ladikas (2009).

Parliamentary Committee model: A dedicated parliamentary committee is in the lead concerning TAs. The committees tend to invite experts to their meetings or organise workshops and conferences in order to gain scientific support for their deliberations and decision making.

Examples: OPECST in France, Committee for the Future in Finland, the Greek Permanent Committee of TA, and VAST in Italy.

Parliamentary Office or Parliamentary Unit model: Parliament has its own office or support unit for TA studies, at the request of parliament. The Parliamentary TA office may be contracted out to an external (scientific) organisation. The Parliamentary TA office may outsource its work to external (TA) organisations and/or experts.

Examples: POST in the United Kingdom, PER in Sweden, CAPCIT in Catalonia, TAB in Germany, STOA at the European Parliament.

Independent Institute (or Interactive) model: The TA organisation operates at a distance from parliament, but parliament is the main client. Typically, these institutes have missions that go beyond informing parliamentarians and also include stimulating societal debate.

Examples: DBT in Denmark, Rathenau Instituut in the Netherlands, TA Swiss in Switzerland, NBT in Norway, and IST in Flanders.

Box 2. 1 Three models of Parliamentary TA organisations in Europe, based on Enzing et al. (2011) and Hennen and Ladikas (2009).

2.2.1 Client and institutional context

Authors like Hennen and Ladikas (2009) and Enzing et al. (2011) group Parliamentary TA practices based on two dimensions. One dimension refers to the task of a TA institute. A distinction is made between organisations that have the task to inform MPs and those that have to inform MPs and stimulate the public debate. In other words, a distinction is made between TA organisations that only have to serve the parliament as its client, and TA organisations that have to serve two types of clients: both MPs and the broader public. The second dimension refers to the institutional setting of the TA institute. A distinction is made between TA organisations that are located inside and outside the parliament. By using these two dimensions, three clusters or models of Parliamentary TA organisations in Europe can be identified: the parliamentary committee model, the parliamentary office or unit model, and the independent institute or interactive model (see Box 2.1). Thus, Hennen and Ladikas (2009) and Enzing et al. (2011) identify the client and institutional setting as key characteristics of Parliamentary TA. The parliament plays a central role in the way these authors conceptualise the client relationship of a TA organisation that performs Parliamentary TA, as well as its institutional context.

Other authors explain that a more in-depth understanding of both the client and the institutional setting are needed. Above it was explained that some TA organisations that perform Parliamentary TA may also have the task of serving the wider public. TA organisations may thus have the task to serve multiple clients, and these various organisational settings and tasks may not exclude each other (Bütschi et al. 2004, 18). For example, in case a TA organisation simultaneously has members of parliament and the wider public as clients, that TA organisation has the task to perform both Parliamentary TA as well as public TA (Van Eijndhoven 1997). In addition, besides having the (national or the European) parliament as a client, the government can also be the client of a TA organisation. This implies that one should be careful when equating or identifying performing Parliamentary TA with a Parliamentary TA organisation. We therefore prefer to talk about a TA organisation that has the task to perform Parliamentary TA, possibly amongst performing other tasks.

In addition, to understand the institutional context of institutes that perform Parliamentary TA, it is not sufficient to only look at the relationship between the TA institute and the parliament. Decker and Ladikas (2004), and also Falkner et al. (1994) and Peissl (1996), on whose work the English description of Parliamentary TA on the ITA-website (2012) is based, show that Parliamentary TA's institutional position towards and linkages with government, societal organisations, and the academic world might also play an important role. This counts both for what Enzing et al. (2011) describe as "independent TA institutes", and for TA practices, which are part of the parliamentary system, or positioned very close to it. Parliamentary TA is never an isolated activity. This is, first of all, because a TA organisation has to compete with other sources of information – that derive from the other spheres – for the "limited attention" of members of parliament (cf. Cruz-Castro & Sanz-Menéndez 2004, 105). Moreover, a TA organisation may be dependent for its own project on the information provided by actors within society, government and the science and technology community. Finally, activities within TA projects as well as results of TA projects may impact actors within those social spheres.

This study aims to take into account the complexity of the institutional context in which TA organisations are performing Parliamentary TA. Consequently, a TA organisation with the task to perform Parliamentary TA is positioned within an institutional space that consists of at least four interconnected social spheres: besides parliament, also government, society and science & technology (see Figure 2.1).

Identifier	Enzing et al. (2011)	Cruz & Sanz (2005)	Decker & Ladikas (2004)	ITA-website (2012), based on Falkner et al. (1994) and Peissl (1996).
Task TA institute / Who is the client?	Task: Inform MPs versus inform MPs + stimulate public debate			Potential clients: Parliament, government, wider public
Institutional setting / linkage	Inside parliament versus outside parliament		Internal office of parliament, link to academia, connection to parliament or government	Link to parliament, government, academia
Who sponsors TA?				Parliament, government, science
Who performs TA study?				In-house expertise, external experts
Who is involved in TA process?		Parliamentarians, S&T and policy experts, wider public		Experts, relevant interest groups
TA models	<ul style="list-style-type: none"> • Parliamentary Committee • Parliamentary Office or Unit • Independent TA Institute 	<ul style="list-style-type: none"> • Political Parliamentary TA • Technocratic parliamentary • Societal parliamentary 	<ul style="list-style-type: none"> • Parliament office • Scientific institute • Public institution 	<ul style="list-style-type: none"> • Classical TA • TA secretariat • Participatory TA

Table 2.1 Existing ways to characterise and model the practice of (Parliamentary) TA.

2.2.2 Institutionalising, organising and performing Parliamentary TA

Besides the task or client of a TA institute and the institutional setting, the literature distinguishes more parameters to characterise the practice of Parliamentary TA (see Table 2.1). For example, the following questions are also thought relevant for typifying (Parliamentary) TA: who sponsors the TA organisation? Who is involved in performing the TA study? And, who is involved (participates) in the TA process itself? In other words, a full analysis of Parliamentary TA should not only look at the way in which (Parliamentary) TA is institutionalised, but also at who is involved in the TA organisation itself, and in the TA projects it carries out, that is, in doing TA. These questions indicate that it is important to look at the institutional level of TA, but also to try to take proper account of the way TA is being shaped at the organisational and project level.

Accordingly, the study makes a distinction between three interconnected levels. The macro-level, or institutional level, concerns the political support for a TA organisation that has the parliament as (one of its)

main clients; it also concerns the way (Parliamentary) TA is legitimised and framed as an institutional solution for an institutional problem with regard to the relationship between science and technology, society, policy and politics. The meso-level, or organisational level, concerns the politics of shaping and controlling the TA organisation that has (amongst other things) the task to perform Parliamentary TA. Finally, the micro-level, or project level, concerns doing (Parliamentary) TA. Issues at this level are: how to frame a certain topic, what kinds of methods to choose and how to communicate the results of your TA project to the parliament, and other relevant clients, in order to have an impact on the (public and political) debate on science and technology.

2.3 Framing Parliamentary TA

Central to the study is to take account of the ways in which (Parliamentary) TA on the institutional, organisational and project level builds connections to the parliament, but also to the three other social spheres: government, science and technology, and society.

In this respect, it is important to understand the practice of Parliamentary TA in both informational and relational terms. Van Rijswoud (2012: 18) argues that “In explaining what an expert is, one can either refer to the particular knowledge people have, or to the position they occupy in a social network”. These two ways are referred to as respectively, the ‘realistic’ and ‘relational’ approach to expertise. The ‘realistic’ approach explains the authoritative position of the expert on the basis of his specialised knowledge; according to the ‘relational’ approach this position is due to the existence of a clientele. In practice, the informational and relational aspects continuously go hand in glove. Namely, exchange of information does not just happen; it needs to get organised. Accordingly, TA is framed in this study as a science-based practice of information production on science, technology and society matters. Moreover, TA is also regarded as a social activity where practitioners try to have an impact on their clients, by building up relations of knowledge sharing and trust with actors from various societal spheres. Of course, for Parliamentary TA, the relationship between the TA organisation and the parliament is of central importance.

In fact, the community of (Parliamentary) TA practitioners already frame their practice in both informational and relational terms, as they broadly define TA as “a scientific, interactive and communicative process, which aims to contribute to the formation of public and political opinion on societal aspects of science and technology” (Bütschi et al. 2004: 14). This definition mainly refers to the micro-level, the practice of performing Parliamentary TA. In this section, this line of reasoning is applied to all three levels. And on these levels Parliamentary TA is positioned within the institutional context, which is defined by four societal spheres: parliament, government, science and society (See Figure 2.2).

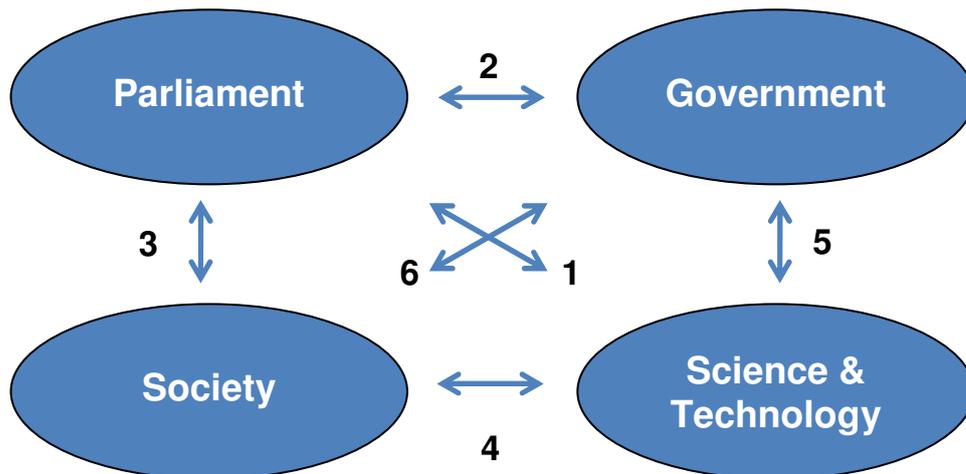


Figure 2.2 (Parliamentary) TA between parliament, science & technology, government and society

2.3.1 Institutionalising Parliamentary TA

Parliamentary TA as part of the national innovation system

The political question of whether or not to set up a TA organisation that performs Parliamentary TA is part of the wider policy discourse on science, industry and/or innovation. Setting up a TA organisation is a specific political intervention or policy instrument. It is an institutional solution for an institutional problem.

Technological change has long been portrayed as something that is developed in isolation from politics and society. This belief fostered a laissez-faire attitude towards science and technology. TA can be seen as critique to this position. First, it assumes that existing institutions, e.g. parliament or government, are not sufficiently equipped to adequately deal with technological change. Second, TA presents itself as an institutional solution and, at the same time, as a practice that empowers the parliament (Parliamentary TA), society (public TA), government, and science and technology, to adequately anticipate potential positive and negative aspects of technological change.

TA presents a political practice contested in principle. Promoters of TA therefore face the challenge of first finding and then maintaining sufficient support for institutionalising TA. The support and critique TA receives from each of the four identified spheres is relevant. For example, who sponsors the TA organisation, and is the science community promoting TA? Moreover, it is of interest to know what kind of conditions led to the institutionalisation, and possibly also the re- or de-institutionalisation of (Parliamentary) TA.

Parliamentary TA as an institutional solution

As said, this study conceptualises a TA organisation as an institutional solution to an institutional problem. Both the problem and the solution are defined by both informational and relational aspects. TA promises to deliver a special science, technology and society (STS) expert knowledge. As such, it assumes that there is a lack of such knowledge.

With regard to relational aspects, it is assumed that there is an actor or a client who is in need of that particular STS expertise. We are interested in finding out which clients the TA organisations are supposed to serve. As said earlier, a TA organisation may have the task of serving multiple clients. Another important question is where to position the TA organisation within the institutional space that is defined by parliament, government, science and technology and society.

From a political perspective, it is particularly important to understand how a TA institute is expected to influence the relations between the four societal spheres (see Figure 2). This is illustrated by the history of the establishment of the American Office of Technology Assessment (OTA) in 1972. OTA challenged the existing relationship between Congress, the government and science. In the 1960s, the US Congress feared that with respect to making decisions on S&T it had become the “rubber stamp” of the bureaucracy (Kunkle 1995). The establishment of a congressional TA bureau was a way to redress the imbalance between legislature and executive with regard to technological change (relationship 2). Besides, this TA organisation strengthened the relationship between the Congress and the scientific community (relationship 1).

It follows that depending on the way a TA organisation has been institutionalised, it may influence the relationships between, for example, parliament and science (interface 1), parliament and government (interface 2), parliament and society (interface 3), science and society (interface 4), government and science (interface 5), government and society (interface 6), and even combinations of these. A TA organisation that performs Parliamentary TA is supposed to influence at least one of the following three interfaces: 1) parliament and science, 2) parliament and government, 3) parliament and society. When a TA organisation has to serve more clients, the number of relationships it has to deal with increases.

2.3.2 Organising Parliamentary TA

The organisational level is about the question of which actors from which societal spheres are involved in the functioning of the organisations. Each organisation has several ways of arranging such involvements. In this study, they are referred to as organisational mechanisms (see Table 2.2).

First of all, who are the clients of the TA institute? Another relevant question is who the sponsors are, and in which way they are involved in the TA organisation and processes. Furthermore, we are interested in answering these questions: who appoints the members of the board, committee or platform; from which societal spheres do the members of the board originate; and what is the role of the board. Another matter is: who is involved in defining the agenda or working programme of the TA institute? And who is involved in performing the TA project? For example, in France it was concluded after an experimental phase that doing TA was regarded as a political activity. Consequently, it was decided that MPs themselves would be responsible for leading the TA projects (cf. Van Eijndhoven 1997: 271-272). In other countries, the TA project is guided by TA practitioners, normally scientifically trained researchers. In many cases, the TA project is assisted by an advisory committee. What kinds of actors are normally selected as members of such an advisory committee?

Organisational mechanisms	Societal spheres involved			
	<i>Parliament</i>	<i>Government</i>	<i>Science & technology</i>	<i>Society</i>
<i>Client</i>				
<i>Funding</i>				
<i>Evaluation of the organisation</i>				
<i>Board, Steering Committee, Panel or Platform</i>				
<i>Working programme</i>				
<i>Staff</i>				
<i>Project team</i>				
<i>Project participation</i>				
<i>Project advising and/or reviewing</i>				

Table 2.2 Matrix to indicate which actors from the various societal spheres are involved in the activities of the organisation performing Parliamentary TA.

2.3.3 Performing Parliamentary TA

It was stated above that a TA institute that performs Parliamentary TA does not only perform research. Often, its institutional mandate and responsibility forces the institute to go outside of its scientific comfort zone and get into contact with the outside world, that is, the other three societal spheres: parliament, government, and society. Maintaining a credible position in the academic world and also in the other three societal spheres requires, what Thomas Gyrien (1983, 1995) calls *boundary work*. Gyrien studied how scientists acted outside the academic sphere, for example in advising governments (interface 3) and communicating to the public (interface 4). Scientists tried to establish and maintain an authoritative position by distinguishing themselves from ‘non-science’. Van Rijswoud (2012: 20) explains that “[b]oundary work thus closely relates to the efforts going into maintaining a clientele, or in acquiring symbolic capital”.

Doing Parliamentary TA requires boundary work. For one, it needs to maintain its credibility towards the scientific community. For this, TA must uphold to scientific quality standards. As indicated above, TA has to compete with many sources of information for the “limited attention” of political decision makers and the public. In order to survive, TA is challenged to acquire its own special identity in association with the parliamentary system. This requires boundary work, in the sense of building connections of trust to the parliament and/or making itself useful for MPs. At best, clients should feel a kind of ownership over the information communicated to them by the TA organisation (Cruz-Castro & Sanz-Menéndez 2004: 108). In case the TA organisation has more clients, a similar argument holds. For example, when a TA organisation works for the government, it has to build contacts with policymakers and it has to build knowledge about the policy process within the TA organisation.

In this study we are interested in how, on the concrete project level, the TA organisation performs its boundary work; in other words, how does it make a connection to the parliamentary process? In case a TA organisation has multiple clients, we are also interested in how it connects its work to the other societal spheres: science, government, and society. We will study this boundary work in all the phases of the project life cycle, from selecting the topic of the TA project and defining and writing the project plan, to performing the TA project and communicating its results.

2.4 From concepts to practice: in-depth country and region descriptions

In the following chapters, the practice of PTA is described in detail for Austria, Catalonia (Spain), Denmark, Flanders (Belgium), Germany, the Netherlands, Norway and Switzerland. For each country or region, one actual project is included as a case study, further illustrating the ‘nuts and bolts’ in daily practice. Overall, the report is based on interviews, institutional archives, websites, earlier descriptions and expert judgement.

In the concluding chapter, we return to a more conceptual reflection on these practices. A comparative analysis is carried out, which is extended to organisations in Finland, France, Greece, the European Union, Italy, the United Kingdom and the United States.

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Chapter 3 Parliamentary TA in Austria

Michael Nentwich, Walter Peissl and Mahshid Sotoudeh (all ITA-OEAW)

3.1 The institutionalisation of the Institute of Technology Assessment

As yet, no genuine parliamentary technology assessment exists in Austria. The main TA institution – the Institute of Technology Assessment (ITA) – is affiliated to a large research institution and has no formal ties with the national Parliament. While ITA has a past and current record of collaboration and exchange with Parliament in various forms, and despite a number of initiatives, the political system in Austria has not yet been prepared to institutionalize PTA in a way similar to other countries. In the following, initiatives and the current state of affairs will be described.

3.1.1 Political Momentum

Similar to a few other countries in Europe, the discussion about the social consequences of new technologies – and hence also about TA – began in Austria in the late 1970s and early 1980s. Since 1978, when the majority of Austrian citizens rejected the newly built nuclear power plant at Zwentendorf in a plebiscite, it has been obvious, that such expensive errors should be avoided, using systematic analyses and a prospective technology policy. The second hot political issue was the conflict around the hydroelectric power plant in the river Danube near Hainburg, east of Vienna, in 1984. There was an intensive struggle between government, industry and the trade unions, on the one hand, and mostly young ecologically oriented people, on the other, who wanted to (and did) protect one of the last unspoiled alluvial forests.

As early as 1980, a symposium on “Technology and Society” was held in Vienna, which can be regarded as a kind of starting point for the implementation of technology assessment. One of the speakers at this symposium was Ernest Braun, a British-Czech-Austrian physicist and head of the Technology Policy Unit of the University of Aston in Birmingham (UK). One of the outcomes of this symposium was an invitation for Prof. Braun to join the Technical University of Vienna as a visiting professor. It was a few years later, however, that the course of the events gained momentum: In a symposium in 1984, the Minister for Science and Research for the first time officially spoke about the demand for an institution like the OTA in Austria (BMWF 1984, p. 5).

Some features characterized the parliamentary system in Austria at that time (and still do today to some extent): an absence of any policy advice from the social sciences, few opportunities for parliamentarians to get assistance and a strong pre- or extra-parliamentary decision-making system. The specific Austrian corporatist structure, usually labelled “Social Partnership”, was dominant in the political system at that time. There was (and is) a very close relationship between Austrian political parties and respective interest groups. Most of the parliamentary work in Austria consists of discussing and approving government proposals, elaborated by the federal ministries and fine-tuned under the influence of the social partners. Members of Parliament did not have a personal budget to hire staff until June 1992. Even the budgets from then on were and still are too small to pay scientific staff; consequently, the only way to get assistance was to pool the resources of several MPs and still rely on the preparatory work done outside Parliament – the think tanks of the social partners and those related to the executive branches of government, i.e. the federal ministries.

Against this background of a rather weak Parliament and important decision-making forums outside the legislative branch of government (ministries, social partners), it comes as no surprise to experts of the Austrian political system that TA has been institutionalized outside Parliament: On the initiative of the Minister for Science and Research, a TA working group was established in 1985 within the framework of the Austrian Academy of Sciences (OAW). This group was attached to the Institute for Socio-Economic Research, which later changed its name to Institute for Socio-Economic Research and Technology Assessment. In 1987/88, the Commission for Technology Assessment, then renamed Technology Assessment Unit (TAU; German: Forschungsstelle für Technikbewertung/FTB) was finally established as an independent offspring of the former institute. The first director (1987–1991) of this TA unit was Ernest Braun.

Despite the influential US American example of the OTA, TAU had no specific ties to Parliament and established itself as a think tank for the executive branch of government and as a research group accepting also projects from the European Commission and others. In the first years of formation and development, TAU conducted comprehensive and classical expert-oriented projects in the field of information and communication technologies (ICT). By recruiting new employees, environmental issues, medical issues and biotechnology have been subsequently added to the portfolio.

The second phase of consolidation and differentiation started with a change in the management of the institute. The Austrian economist Gunther Tichy, professor at the University of Graz, senior researcher at the Austrian Institute of Economic Research (WIFO) and member of the Academy, was appointed TAU's second director in 1991. Gunther Tichy's position at the ÖAW and his well-known status in Austria's technology policy was an enabling factor in the firm institutionalisation of the unit. After an external evaluation in 1994 the hitherto temporary research unit was transformed into a permanent research institute of the OAW and renamed Institute of Technology Assessment (ITA; German: Institut für Technikfolgen-Abschätzung). With regard to contents the major focus of projects of TAU, and then ITA, was still in the field of new information and communication technologies, to which new issues, such as telecommuting and electronic administration, were added. Thus, the range of projects was further expanded and since the middle of the 1990s ITA has dealt with environmental issues, the biotechnology conflict, problems and challenges deriving from the information society (e.g. privacy and cyber science) as well as issues in health technology assessment (the latter area moved to a newly established unit outside ITA in 2006). This line of research was continued and further diversified under the current director, who has held office since 2006, Michael Nentwich, an Austrian legal scholar and science & technology researcher with a background also in political science and economics (Peissl/Nentwich 2010).

While the main addressees of ITA's work have been government and research communities, ITA worked occasionally directly for Parliament in its first years of existence: In 1990 an expertise about a 380 kV power line from Kaprun to Zell am Ziller was carried out for the Petitions Committee (Braun et al. 1990). In 1992, it had been initially suggested that the first Austrian Enquiry Commission – a new parliamentary instrument for Austria – should discuss the possibilities of TA as such (like the German Bundestag did). However, the Parliament took another decision and invited TAU to assist the committee procedure and to give an overview of the social and political problems related to the application of genetic engineering. ITA produced a respective report and also advised the MPs in the editorial committee, who drafted the final report of the Enquiry Commission (Torgersen et al. 1992). Despite these promising beginnings, the relationship to Parliament was not further institutionalized for various reasons (cf. Peissl/Torgersen 1994). The most important reasons were probably a) missing contact persons in the Parliament: after the elections in 1994 some core members of the Enquiry Commission did not get re-elected; b) lacking financial resources of the

Parliament, which did not have any available funds to commission studies at that time and c) the legitimate question whether Parliament is the ‘right place’ among all relevant state institutions for discussing technological and political issues and deciding upon them.

Since then, the relationship between the Austrian Parliament and TA are on a personal rather than on an institutional level as individual ITA staff members are regularly invited to parliamentary hearings in order to give expert advice. Occasionally, members of the Austrian Parliament participate in project advisory boards and attend project-related events. Since 2007, efforts have been made to reinforce this relationship. In 2008, the Green faction invited Ulla Burchardt, Member of the German Bundestag, Armin Grunwald, head of the TAB, and senior ITA staff with a view to informing the members of the Committee for Research, Innovation and Technology about TA and ITA, followed by a formal hearing in that Committee in autumn 2010. Since 2011 the self-description of the Parliamentary Committee of Research, Technology and Innovation includes a direct reference to TA (Nationalrat 2011). Currently negotiations regarding a closer relationship between Parliament and ITA are under way.

To sum up, ITA has established itself over a number of years as the central TA research unit in Austria and a well-known actor within the European TA scene, but it is still to establish sustainable ties with the Austrian Parliament. It participates in a wide range of international and EU projects, including those carried out for the European Parliament, and is a key member of all main networks in the field. Starting with only a handful of staff scientists in the 1980s, ITA has grown over time with the help of successful project applications and a corresponding rise in basic funding to its present size with, currently, approximately twenty full-time equivalents of staff. Owing to this development and the organisational setup, ITA is currently able to cover a considerable range of highly relevant issues in the context of TA and to react rapidly to new developments.

3.1.2 Actual institutionalisation

As mentioned above, ITA is a research institute of the Austrian Academy of Science. Although since 2011, the bylaws of the Academy have enlarged the room of manoeuvre for institutes, Academy institutes have no independent legal personality and heavily rely on the Academy’s central administration for personnel management, book-keeping etc. Due to its interdisciplinary composition and research tasks, the Institute is one of the few research units of the Academy that are not affiliated to one of the two divisions (mathematics/natural sciences and humanities/social sciences), but to the Academy as a whole (“Gesamtakademie”). For administrative purposes, the office of the division of mathematics and natural sciences is responsible for ITA. The institute is advised and supported by an international scientific advisory board (SAB) and is evaluated externally at approximately six-yearly intervals.

ITA’s current mission statement reads as follows:

“The Institute of Technology Assessment (ITA) is an interdisciplinary research institute for the analysis of technological change, focusing on societal conditions and shaping options and impacts. Scientific technology assessment applies a broad array of methods stemming from a multitude of fields. An essential element of technology assessment methodology is the inclusion of various bodies of knowledge, values and interests via participatory procedures. Internal project teams, often in collaboration with external partners, carry out interdisciplinary and trans disciplinary scientific analyses.

The aim of applied and scientifically oriented technology assessment is to generate knowledge relevant for decision-making and to identify intended and unintended consequences of development options. This knowledge is targeted at supporting politics and administration, on the one hand, and at the general public on

the other hand. Our academic work seeks to better understand the societal relevance of technology and to develop further the methodological basis of technology assessment.”

There is no “constituent instrument” other than the subsequent formal decisions to establish, rename and renew the unit, taken by the Academy’s bodies and recorded in internal minutes. The above mission statement has been elaborated and adapted by the members of staff and the director of ITA from 2006 onwards. It represents a common understanding of the tasks and mission of the institute within the Academy as reiterated on several occasions, not least in the so-called Kuratorium, which was the predecessor of the current SAB and consisted of representatives of the Academy.

The mandate of ITA is therefore twofold: it has an academic mission and a role to play in providing knowledge to society and politics. The Parliament is not explicitly mentioned but subsumed under the term “politics”. Therefore, ITA’s target groups are manifold: As a political advisory instrument, the aim of TA is not only a reflective analysis of social changes related to technological innovations; rather, it provides information and advice to decision-makers. The target technology-policy actors in the public sector include Parliament, the administration, the professional chambers and other public institutions; ITA has conducted work for each of them. With these political target groups in mind, ITA does not only serve the academic community but strives to distil options for decision-oriented actions. It provides a basis of information to those who are interested in the conditions and effects of technological change and particularly to decision-makers who shape this change.

On a formal basis, no institution is obliged to react or follow the recommendations made in ITA studies. In reality, institutions that commission studies to ITA use the results in different ways. As for TA in general it is difficult for ITA to track back direct impacts of its studies. Moreover, ITA’s affiliation to the OAW has enabled independent and impartial consulting, but at the price of a certain political distance.

While a productive cooperation with other administrative domains has developed in the meantime, in the early phase of institutionalisation mostly the Ministry of Science and Research (BMWF) commissioned studies to the institute. Inter alia, the BMWF had set up the (now discontinued) Council for Technology Development shortly after the formation of TAU, whose scientific secretariat was provided by TAU in close cooperation with the technological policy department of the BMWF. As already mentioned, in the early 1990s the institute also worked directly for Parliament, while today it mainly addresses actors outside Parliament. According to the peculiarities of the Austrian technology policy, the main focus of ITA is with the executive branch, in particular various Austrian federal ministries and the European Commission at the international level. Main addressees are the ministries with technology policy competences like transport, innovation, energy, technology, economics, science and research. Moreover, ITA works for the Federal Chancellery and other ministries such as environment and consumer protection. Further cooperation partners and awarding authorities used to be the Council of Science and Technological Development (RFTE), various agencies, e.g. in the environmental sector, and public bodies such as the Federal Environmental Agency (Umweltbundesamt) as well as the Vienna Science and Technology Funds (WWTF). The Federal Chamber of Labour, the Austrian Health Promotion Foundation, the Advisory Council for Economic and Social Affairs and some non-profit housing cooperatives, various associations and public institutions commissioned studies to ITA.

From the very beginning of its institutional life, ITA cooperated with the European Research Area. From 1988 on it took part in different research programs of the EU, and in 1993 it became an associated member

of the European Parliamentary Technology Assessment network (EPTA) due to ITA's work for the Austrian parliament's Enquiry commission mentioned above.

Looking at ITA's role in political consulting and the potential impact of studies it is particularly important to emphasize the contacts to the European Commission. These contacts have been established based on an institutional membership in the European Science and Technology Observatory (ESTO) and its successor, the European Techno-Economic Policy Support Network (ETEPS). ITA also entertains good relations to the Institute of Prospective Technological Studies (IPTS) in Sevilla, which is part of the Joint Research Centre of the EU. Besides the European Commission, ITA most recently addresses the European Parliament as well within the framework of the European Technology Assessment Group (ETAG). Within the TA community in Germany, Switzerland and Austria, ITA acted as a founding member of the German-speaking Network Technology Assessment (NTA).

3.1.3 Financing

Currently, ITA's work is mainly financed by the Ministry of Science and Research through its mother institution, the OAW, and, accounting for roughly forty percent of income, by third-party funds. These additional funds stem from research funds (Austrian or foreign, incl. supranational, i.e. the EU framework programs), the governmental side (various Austrian ministries, agencies, the EU Commission), the social partners, and more recently to a limited extent from the European Parliament. The overall annual budget amounts to approximately € 1.5 million.

3.1.4 Quality control

For the institute as a whole, the quality control mechanisms are:

- an annual report to the Austrian Academy of Sciences,
- biannual reporting to the scientific advisory board (SAB) of the institute consisting of six international TA scientists and researchers, nominated by the Academy, and
- an external evaluation of the institute every six years. This is done by an international expert group, consisting of (three) academics, appointed by the Academy. So far, this evaluation procedure does not involve stakeholders.

For specific projects, in particular EU-funded ones, evaluation is organized on a project level, involving either the EU Commission and/or external evaluators.

Furthermore, the quality control of projects and publications are conducted through internal supervision by colleagues at ITA and scientific publication norms. Procedures include:

- a weekly Jour Fixe, which guarantees communication flow and interdisciplinary exchange of ideas;
- internal project advisory boards established for each project, comprising at least one staff member not engaged in the scientific/technological field at stake;
- external advisory boards with members of the awarding authority, administration or further experts, established for specific projects;
- project seminars, in which each project team presents the project at least twice to ITA staff, once in the beginning and once before writing the concluding recommendations;

- proofreading of all publications (if not co-authored anyway) by at least one colleague internally before submission;
- bi-monthly seminars (internal, but open to the public) addressing TA-related issues and aiming at advancing the communication with the scientific community.

3.2 Institutional context of the Institute of Technology Assessment

3.2.1 Relationship with stakeholders

Being part of the Austrian Academy of Sciences, ITA is part of the scientific community and therefore is not formally linked to any stakeholder within the Austrian political system. This ideally reflects the neutrality of technology assessment. Although there is no formal link to Parliament (see above), ITA has had good contacts to individual Members of Parliament from the early 1990s on. A number of examples across Europe show that it is necessary to find promoters of TA among the Members who actively want to get involved (Peissl/Torgersen 1996). The history of PTA is to some extent a history of individuals, being convinced of the benefit of TA for technology policy. Currently, ITA has good contacts to the head of the Committee for Research, Technology and Innovation in Parliament, who promotes TA and is working towards a closer link between Parliament and ITA. Slow internal procedures, minor political quarrels and external demands from other policy fields so far prevented the Austrian Parliament from implementing closer and more formal ties. By contrast, being part of the European TA Group (ETAG), ITA has worked for the European Parliament on a project basis since 2010.

With regard to other stakeholders, ITA has no formal links either, but entertains good contacts on the level of projects. Some projects have advisory boards, including members of public administration, or are commissioned by federal ministries. All projects include the relevant stakeholders in their contact database and involve them for advisory group meetings or other procedures like expert workshops etc. These contacts also include the well-established stakeholder institutions that are part of the Austrian “Social Partnership” (see above), as well as NGOs.

Links to universities and other scientific groups are established on a personal level. Most of the ITA staff members regularly teach at different universities in Austria and abroad. During its more than twenty years of existence, ITA has built a network of experts in and outside universities, which is utilized in different forms on project levels.

As far as the general public and the media are concerned, we try to care for our contacts. Occasionally, journalists invite ITA staff members to radio and, more rarely, to TV broadcasts, sometimes staff members approach them on their own initiative. Although ITA has an elaborated public relations concept, implementation will be improved. Nevertheless, ITA is one of the institutes of the OAW that get cited in the press most often. The press and an informed public is also addressed by the quarterly newsletter “ITA-News”, which reaches in its printed form approx. 500 addressees and is electronically downloadable from ITA’s website as a PDF. All reports, working papers and a selection of ITA’s academic publications are available open access from the ITA website or from the institutional repository of the OAW. ITA also contributes to outreach activities to the broader public such as the “Long Night of Research”, where on a specific day many scientific institutions open their laboratories or arrange interactive exhibitions all over Austria.

3.2.2 Relationship with other TA and TA-like activities

In Austria there are no direct ‘competitors’ as ITA is the only academically oriented institution that is dedicated to TA’s classical mission and interdisciplinary approach. There are, however, a few other Austrian institutions, units, working groups or single researchers who address similar topics. However, they often do TA not in the form of a systematic and coherent research focus but occasionally and, at most, partial; in the sense that they always focus on specific aspects of the technology/issue at stake. In other words, all other units perform TA not as their core business but do TA studies from time to time as a corollary to other research activities. Some of the research groups in Austria who also deal with future technological developments do this either in a foresight or mainly in a disciplinary perspective, as they usually lack the resources to include multiple perspectives (in particular also the natural and technical sciences) in a project; at ITA, this would be the exception rather than the rule. Others focus more on the perspective of STS-SSS (science and technology studies or social studies of science), mainly rooted in sociology, epistemology or political science. ITA, by contrast, follows an explicitly interdisciplinary approach. Therefore, ITA is similar to other institutions in certain dimensions only, but never in all. Most importantly, it is the only institution with an explicit TA focus that works at a highly interdisciplinary level and largely sets its agenda according to research-driven priorities. In that sense, it has a very specific function in Austria, which others do not fulfill. However, multiple personal contacts and a history of cooperation interlink some of the above-mentioned institutes and foster communication within the community.

3.2.3 Reflection on the institution’s niche

ITA is undoubtedly the central hub for TA in Austria and has gained high relevance in the European TA scene over recent years. The following facts support this claim: ITA keeps organizing the only TA conference series in Austria (which is one of two in this field worldwide). ITA is the Austrian member of the European TA Group (ETAG) delivering scientific analyses to the European Parliament, and it is a partner organisation in practically all other large international TA consortia. It maintains long-standing relations with other national institutions involved in TA-related research and collaborates on a frequent basis with many TA institutions in other European countries. ITA coordinated EU consortia on several occasions or led important work packages in international projects. ITA’s research portfolio covers most of the current ‘hot issues’ of TA research, and ITA researchers represent a wide variety of scientific expertise. Recently, the Austrian Council of Research and Technology (RFTE) in its 2009 technology policy agenda suggested strengthening the role of ITA in Austrian technology politics. Having ITA in mind, also the latest FTI strategy of the Austrian government (March 2011) lists the extension of independent TA as a measure to meet the challenges in the area of research and society. On an international level, ITA is known for its strength in research-based TA with a high publication output and academic reputation.

All TA institutions are somewhat unique because they are closely adapted to their specific scientific, political and societal environment, resulting in combinations of distinct features. The same holds true for ITA: Like the Rathenau Instituut and TA-Swiss, ITA is part of an Academy of Sciences. With its strong academic orientation and scientific output, coupled with a broad coverage of TA topics, ITA is comparable – although considerably smaller – only to ITAS in Germany. Unlike the full members of EPTA, ITA is not linked to the national Parliament, enjoying freedom in the selection of topics and projects and the option to deliver scientific advice to all kinds of institutions and branches of government. ITA is medium sized, comparable to the TA department of Rathenau, far bigger than most of the parliamentary units but much smaller than ITAS. ITA carries out its research mainly through its internal staff, often in collaboration with other TA institutes, occasionally subcontracting external researchers (comparable to ITAS, and unlike TA-Swiss and TAB).

3.3 Organisation of work at the Institute of Technology Assessment

3.3.1 Organisational structure

ITA is led by a director and, at present, employs about 20 staff in a very flat hierarchy. The researchers' expert knowledge in economics, business management, sociology, political science, telecommunications, informatics, information security, molecular biology, genetics, human ecology, chemistry and law is brought together in project teams assisted, if required, by external experts. An office team of currently four members is responsible for administration, public relations, project and knowledge management as well as computer support. Bookkeeping, personnel management and legal affairs are dealt with by the central administration of the OAW.

3.3.2 Priority setting

Research at ITA is always organized in projects, even if not externally co-financed. ITA carries out a considerable number of projects in parallel. A medium-term research program, adapted annually, covers three years ahead (currently 2012–2014) and defines the main research areas. Proposals for new projects from the team mainly result from ITA's monitoring activities executed in parallel to the research activities. Being embedded in an international network enables ITA to detect emerging technological trends and societal problem areas at an early stage and to further develop its research portfolio continuously. A two-day workshop finalizes the annual adaptation phase. As a medium-scale institute, ITA has to select issues of priority according to its specialization and expertise, complementing the international TA scene in a meaningful way. The medium-term research program is also presented to the scientific advisory board. Board members comment on it and provide guidance to its further development. There is, however, no involvement of stakeholders in setting the research priorities as yet.

This program is not a formally binding and thus potentially suffocating plan; rather, it provides a flexible framework for ITA's project work. In principle, the institute is free to respond to thematic calls from funding agencies or governmental bodies. Irrespective of formal external procedures like delivering proposals to funding agencies, a TA project is developed internally in a standard procedure. As a pre-condition, the research question or objectives of the new project must fit the medium-term research program. If this is the case, the internal promoter of the project brings the project idea to the weekly *jour fixe* and presents it to the team. After a discussion among the team members and the director's approval the project idea is further elaborated, usually involving other partners as well.

3.3.3 TA approaches

Throughout its history as a research institute, ITA has been largely committed to *classical TA* with its emphasis on expert knowledge. Apart from TA-specific approaches, methods include expert interviews, literature and document searches as well as other quantitative and qualitative empirical methods from the social sciences. ITA also engages in the methodological development of qualitative methods (expert interviews, participatory procedures, etc.).

Worldwide, participatory methods in TA have increasingly gained importance due to the tendency to integrate value-related issues into TA projects, the importance of new actors in the design of technologies, and environmental and technological conflicts appearing on the public agenda. ITA is fully aware of this development and has contributed on a conceptual and methodological level. From 2007 onward, ITA has been using participatory elements and methods in its projects as well. Pertinent experiences range from focus groups and scenario workshops to fully-fledged citizen conferences. Furthermore, ITA also has a tradition in

employing the Delphi instrument in foresight studies. As early as the late 1990s, ITA initiated the first Austrian Technology Delphi survey with a strong participatory element. *Participatory TA* has since become an integral part of ITA's work program.

Rather than a (theoretically motivated) general preference for particular methods, the needs of the project and of the issue at stake determine the appropriate approach and methodology. Important criteria derive from the character of the research question or the conflict eliciting the research interest. For example, questions of risk are appropriately dealt with using (expert) knowledge based studies; conflicts over values and interests call for lay or stakeholder participation (for further details see Nentwich et al. 2006). Summing up, ITA follows both expert-oriented and participatory approaches according to the topic, often combined in a single project.

3.3.4 Overview of projects and output

The current medium-term research program 2012–2014 (ITA 2011) focuses on three thematic areas, namely the information society, governance of controversial technologies, and technology and sustainability. Furthermore, an overarching research area brings together monitoring activities and critical reflection on, and further development of, TA methods.

In the area of the “information society”, ITA addresses three topics. “E-governance” is a catchword indicating the potential of ICT for enabling electronic interactions within government and between citizens, private sector organisations and governmental agencies at different levels. The analyses initially concentrated on the launch of electronic administration (e-government) and currently focus on the potential and obstacles of online political participation, which can be subsumed under the concept of “electronic democracy”. Under the header of “privacy”, ITA analyses the relation between technologies, fundamental rights and social/political consequences as a basis for deriving options for action. The starting point and core focus of the analyses are the effects of new and future ICTs on the private sphere. The third sub-topic, “networked environments”, is dedicated to the social consequences of pervasive computing and ambient intelligence. New media constitute another focus of interest, in particular the effects of their use on geographical and social structures and on modes of work in academia, especially with regard to Web 2.0 (“cyberscience”). In the field of “governance of controversial technologies”, ITA investigates technology controversies and their significance for, and role in, the process of governance. Technology controversies have left deep traces in modern society. Disputes not only pertain to specific applications (such as in agro-biotechnology) but also to what kind of research and development is to be pursued (for instance with respect to stem cell research) and how this should be done. Current hot topics are nanotechnology as well as synthetic and system biology. The work in the field of “technology and sustainability” has to be seen in the three-tiered framework of sustainability. An important issue is the discussion on the effects of climate change and resource shortages and the social problems they give rise to. ITA investigates and evaluates possible consequences of technologies, in particular the conditions under which a technology can contribute to sustained development. Current projects address energy technologies, climate change, ageing society and TA in engineering education.

In the following list, ITA's recent projects are categorized into (1) research and fact finding; (2) stimulating public debate and participation; and (3) influencing political decision-making.

(1) Research and fact finding

Most of ITA's projects fall in this category. Typically expert-driven, they gather, analyze and present facts, including technological and societal developments, and evaluate potential consequences and policy options. Recent examples include:

- Incorporating European Fundamental Values into ICT for Ageing: A Vital Political, Ethical, Technological, and Industrial Challenge (2010–2014)
- Interactive Science – Internal Science Communication Via Digital Media; Sub-project: Collaborative Knowledge Management and Democratization of Science (2008–2011)
- Integrative Analysis of the State of Knowledge Regarding Health and Environmental Risks of Nanotechnology, Including Establishing a Clearing House (NanoTrust) (2007–2013)
- Smart Response – Demand Response for Austrian Smart Grids (2010–2011)
- Communicating Synthetic Biology (COSY) (200–2009)
- eID – Systemic Change of the Identification of Citizens by Government – Electronic Identity Management as a Complex Technical Innovation and its Organisational, Legal and Cultural Matching in Selected European Countries (2007–2008)
- KB:Law|©: Knowledge Based Copyright Law (2007–2009)

(2) Stimulating public debate and participation

ITA usually intends to contribute to the public debate about new technologies and their consequences. Sometimes this is done more passively, via freely available research reports, the quarterly newsletter, or the mass media; as well as through conferences and lecture events and using Internet channels, more recently also Web 2.0 platforms. On other occasions, the active inclusion or participation of lay people and stakeholders in a project contributes to stimulating public debate. Participants serve as multipliers: they not only convey their knowledge from their every-day lives into the process but also distribute what they have learned or gained from their attendance in their respective networks. The following list includes some recent participatory projects:

- Comparative Assessment of e-Participation in the Context of Sustainable Development / Climate Change (e2democracy) (2009–2012)
- Citizen Visions on Science, Technology and Innovation (CIVISTI) (2008–2011)
- World Wide Views on Global Warming. A global citizen consultation on climate policy (WWViews-Austria) (2008–2010)
- Future Search & Assessment “Energy and End Users” (2007–2008)
- Privacy enhancing shaping of security research and technology – A participatory approach to develop acceptable and accepted principles for European Security Industries and Policies PRISE (2006–2008)

(3) Influencing political decision-making

As a scientific research unit ITA is not as close to political decision making as other PTA institutions. However, ITA may influence Austrian and European politics via its written output – the executive summaries of all project reports – and through personal communication and direct interaction with

stakeholders and decision makers. The set of addressees (Parliament, federal ministries, the European Parliament etc.) calls for different strategies for delivering results. Examples are:

- The NanoTrust project combines three classic roles of TA: research, fact finding and the organisation of debates. It was established with a view to scanning the knowledge base with regard to environmental and health related problems of nanotechnology. Providing access, and giving an overview on existing literature and debates, it functions at the same time as a platform for the discussion between science and politics of open questions. Results from NanoTrust feed directly into the nanotechnology-related policy of the federal ministries concerned.
- At the international level ITA serves the European Parliament's TA unit STOA within the framework of the European Technology Assessment Group (ETAG). It gives policy advice to the European Commission via several projects and the personal involvement of staff members into advisory bodies such as the ethical board of DG Research.

3.3.5 Reflection on criteria of success

On the institutional level, the success of ITA can be measured in the number and quality of publications in academic journals and books (preferred peer-reviewed, English-speaking), of oral presentations at conferences (preferred invited keynotes at international events) and of third-party funds raised (preferred competitive grant research). These performance figures are core criteria in the annual reporting, the assessment by the Scientific Advisory Board and the regular evaluation teams. In addition, the number of popular science talks and publications as well as the media resonance is being reported.

For its individual projects, there is no formal benchmark, except that it should not end showing a negative financial balance, and it should be finished in time. However, as a TA institution, ITA employs a set of implicit success criteria. While the number of scientific articles published and the times a project is mentioned in the mass media (press, radio, blogs etc.) is a positive indicator, there are other criteria that cannot be measured as easily, as for example the political impact. Many studies (e.g. EUROpTA, TAMI) showed the latter to be elusive: sometimes a direct relationship between a project or its conclusions and a political decision can be established, but usually this is not the case. Nevertheless, ITA strives for such impact and tries to follow-up on results, though not always as systematically and actively as possible (there is certainly room for improvement). An indicator for success of ITA projects has been the capability to integrate TA results into the decision-making process at an early phase of the development of national and EU research programs (AAL-benefit, EU Environmental Technologies Action Plan, EU Security Research Program etc.).

3.4 Case study: Ageing. Participative methods for “Technology and Autonomous Living”

Since 1998, ITA has been involved in the implementation of internationally established instruments of stakeholder and citizens' participation in technology policy in Austria (see above). Carefully prepared participative procedures may contribute to the public awareness of issues in science and technology. However, the prime focus of such procedures is to contribute to political decision-making using sources of knowledge other than expert knowledge. In the project „Techpol 2.0: Awareness – Participation – Legitimacy” (2005–2006), participative tools and topics were selected according to their suitability for different specific situations (see Nentwich et al. 2006).

From mid-2006 onwards, an analysis of strengths and weaknesses of participative interaction formats and of the Austrian research and technology policy with a view to finding good institutional and organisational anchors (starting points) allowed to identify appropriate topics for a participatory process. This analysis gave rise to a list of topics and appropriate tools for their application. Techpol 2:0 was the starting point for two other projects at ITA:

- Future Search & Assessment “Energy and End Users” (2007–2008) – a broad dialogue concerning the citizen-related aspects of the national energy research program “Energie der Zukunft” (Nentwich et al. 2008)
- Participative approaches for „Technology and autonomous living“ (2007–2008) – a project to clarify the requirements and conditions for considering social needs and users’ perspectives, and for shaping technologies at a very early phase of the technological development (Bechtold/Sotoudeh 2008). This project served as an initiator for a number of other projects at ITA.

3.4.1 How the topic of the project was put on the agenda of ITA and why

Against the background of the human lifespan increasing in Europe, and the perspective that the number of older people will constantly grow over the next decades, the societal need to actively tackle various problems is evident. The EU Ambient Assisted Living (AAL) Joint Program was initially set up for 2008 to 2013. The program’s planned total budget is 700 M€, of which approx. 50 % is public funding – from the AAL partner states and the European Commission – and approx. 50 % is funded by participating private organisations (e.g. companies)⁴. The Austrian national R&D program “Benefit” embedded in the AAL program aims at addressing these issues by boosting research and development of technology for autonomous ageing.

In the past, various studies conducted at ITA have dealt with the social needs of the ageing population in Austria (for instance, the study “Medizintechnik und Lebenshilfen für ältere Menschen” proposed measures for improving the autonomous living of older adults; autonomous living obviously requires more than mere technological support). Between 2007 and 2008, the Austrian Research Promotion Agency (FFG) commissioned two studies on technology and autonomous living, which served to assess the results obtained under the first call of “Benefit”: “Participative approaches for technology and autonomous Living I and II” (short: pTA Ageing I and II). The first study was a source of information with a view to possibly adjusting the objectives of the program and to further developing project guidelines. It was also intended to inform about future topics, relevant actors and potential pitfalls to be avoided.

3.4.2 Project activities and project results in each phase of the project

After an initial phase of desk research, a customized approach was designed making use of four different information sources in order to approach the challenging topic from the point of view of a “practicing expert”:

1. Exploratory group interviews were conducted to include the opinions of different users and intermediary persons on potential future topics, especially potential barriers to the actual adoption of technology. The different composition of the groups of interviewees served to integrate different perspectives. This allowed the range of future issues relevant for Ambient Assisted Living to be widened.

⁴ <http://www.aal-europe.eu/>

2. Experts in different fields such as gerontology, psychology, sociology etc. were interviewed to provide information complementary to the users', technology developers' and other actors' points of view. The relevant actors were identified through desktop research and co-nomination.
3. A secondary analysis of previous experiences with participatory approaches for ageing issues identified potential pitfalls for such approaches.
4. A comprehensive survey identified institutions and literature relevant to elder care and Ambient Assisted Living in Austria.

Test interviews led to a shift towards more practical aspects: Initially, a pool of questions for both approaches, the group interviews and the expert interviews, was developed. One test interview was conducted for each group to validate the questions, an older adult living alone at home and a physician specialized in ageing problems. Questions had to be adapted from theoretical to practical aspects, as it is better to discuss needs and problems of everyday life than to ask about the concept of ageing, potential technology fields or potential negative or positive impacts of a technology.

Group interviews: The following questions were designed to identify user needs and problems, the specific context, the relation between ageing and technology and the information exchange between technology developers and users: What is important to elderly people in their daily lives? Where do problems appear? What are the surroundings of older adults? What role do technical devices play? How do older adults gather information about technical devices? How can technology R&D learn about the needs of older adults? Five explorative group interviews were held with 26 participants who had been contacted by the project team (January 2007 to March 2007). Each group consisted of three to eight participants with different backgrounds. For instance, one interview was conducted in a small town outside Vienna with women only. The group differences allowed tracking different perspectives to widen the range of relevant future issues. According to the backgrounds, questions were fine-tuned to make sure that the participants would want to talk about a topic without being embarrassed. The group interviews of approximately 2.5 hours featured a short introduction on technology assessment and the project and its background. The method is similar to focus groups except that no standardized information on relevant technologies was provided in advance, because participants should contribute from their own points of view and share their experiences and knowledge as "practicing experts". After a short presentation of the participants, two facilitators moderated an open discussion without interfering with contents, ensuring that everyone got the opportunity to comment on each issue and preventing individual participants from monopolizing the discussion. All interviews were recorded and part transcribed; the facilitators also took notes.

Expert interviews: Between February and April 2008, seven experts from education, social work, gerontology and nursing, psychology and sociology of ageing and consumer policy were interviewed separately for 45 to 80 minutes on the needs of elderly people. The interviews were recorded and transcribed, two were conducted via telephone. The experts were identified through desktop research, co-nomination and recommendations by actors contacted. Questions were: needs and problems of older adults; (potential) turning points in the course of life; surroundings of older adults; estimated future situation and trends; technology and ageing: challenges, problems, potentials; actual and ideal interaction and information exchange between user and technology developer.

Secondary analysis: To identify factors to prevent potential pitfalls in the development of assistive technologies, a secondary analysis of participatory approaches for ageing issues was performed. The aim was to identify recommendations for the Austrian R&D Benefit program and for relevant projects. Seven projects with different participatory approaches were studied, selected according to content (relation to Ambient Assisted Living for the elderly) as well as authors and funding (EPTA network and EU funded projects).

Projects were not compared according to their capacity to engage people in a participatory manner because the design of such processes always requires adaptation to the research question. Instead, projects were analyzed in terms of questions addressed, participatory methods applied and lessons to be learned. Thus, the secondary analysis identified challenges for participation in this field and delivered inputs to avoid pitfalls for the program.

Survey: Using the project results, other relevant institutions in the area of care for the elderly in Austria were identified. The literature survey for 2004–2007 covered all pertinent and publicly available Austrian publications (including research projects) or publications with an Austrian contribution.

Results (for more detailed results see Bechtold/Sotoudeh 2008): Based on the above activities, the final report specifies the context of autonomous living:

- Autonomous living needs to address a number of activity fields of older adults and relevant needs in their daily life, e.g. health, information and learning, security, safety and privacy, supply with goods and services as well as communication and social interaction;
- Important actors influencing the autonomous living of older adults include the family, representative of user groups, industry, etc.;
- Users' behavioral patterns related to trust, experience, self-perception, the influence of intermediary people, etc., provide the context for autonomous living;
- There are trade-offs between benefits and risks of assistive technologies (ATs), e.g. support and social isolation, efficiency, control and bureaucracy in day-to-day care; security and privacy, support and perceived threat for autonomy, mobility and potential under-challenge;
- Conditions for R&D vary in different phases of the development and implementation of technologies;
- In addition, policy and regulation requirements for health care, rural development, technical education and social inclusion at different levels were identified;
- Participatory approaches and integration of users were addressed.

The report includes a number of recommendations to improve the quality of the R&D program:

1. Consideration and coordination of technological, social and organisational factors to foster innovation;
2. Bottom-up approaches to define the social contexts and the underlying needs as a precondition for the design of ATs;
3. Trade-offs between benefits and risks of ATs including socio-economic and cultural dimensions;
4. Coordination of activities at European, national and local level with special attention to geographical and cultural differences and differences between rural and urban needs.
5. The need for a long-term perspective on program and project level.

3.4.3 Type of expertise, organisation and know-how required

Phase 1: From December 2007 to January 2007 the project team (two researchers at ITA with an expertise in participative methods and sustainable development) identified and contacted actors – to inquire whether they would like to participate or send someone to the group interviews. For each group interview a balanced number of potential participants were contacted. In total, approximately 400 relevant persons, institutions, associations, university departments and institutes, enterprises and companies were approached. 26 participants took part in five group interviews. One student did the documentation in each group-interview.

Phase 2: Seven expert interviews were conducted by the project team.

Phase 3: The project team analyzed the results; the report was reviewed by one external and one internal researcher.

Phase 4: The project leader and two students surveyed the literature, reviewed by the second project team member.

3.4.4 Conveying project results to political decision-making

The project aimed at generating knowledge-based advice for a mission-oriented technology and research program in Austria. The Austrian Research Promotion Agency (FFG) decided to integrate experiences and knowledge of (end-)users and intermediary actors at an early stage of the program design, so the project could integrate the results of group interviews in the program development process. The project's intermediary and final results were presented to program officers at the Austrian Research Promotion Agency and staff of the ministry of Infrastructure, Innovation and Technology (BMVIT) responsible for the program design, including external consultants. Frequent discussions between the project team and the staff contributed to integrating the results in the call design. The project provided information on key players, stakeholders and (end-)users and the list of potential pitfalls important for decision-makers in their decision on public investments in ambient assisted living research. Study results were published and presented at conferences for technology developers, producers of supportive technologies, marketing managers and engineers.

3.4.5 Political impacts in each phase of the project

The project showed that participative strategies can contribute to knowledge-based advice for a mission-oriented research program. Results contributed to clarify the requirements and conditions to be met to consider social needs and users' perspectives and shape technologies at a very early phase of technological development. In addition, the results contributed to awareness building of actors involved in the planning phase of R&D and the design of assisted technologies; in the testing phase of products, services and systems as well as during market development. It supported the integration of technology assessment and ethical aspects into the evaluation criteria for the "Benefit" program.

3.4.6 Elements influencing political impact

The development of a research program is a complex process with many different inputs. In most cases, it is hardly possible to determine the actual political impact of a TA project. However, a number of qualitative and quantitative elements appear necessary, but not sufficient, for the quality and, thus, effectiveness of a project.

Qualitative factors:

- Inter- and transdisciplinary project design and performance to achieve socially robust recommendations,
- Full cooperation and functioning communication between the project team and the contracting body/addressee
- Timely delivery of results to be integrated into policy making processes
- Adequate communication and presentation of relevant results to the addressees of the policy
- (Scientific) publications that contribute to a broader debate on the role of participatory approaches in policy making

Quantitative factors:

- Availability of time and financial resources for participatory procedures

3.4.7 Project success and lessons learned for improving the impact

According to the Austrian Research Promotion Agency the project was successfully performed. Nevertheless, it is not possible for program officers to exactly identify the impact of a project on program development. The main influence of the project that is evident has been the integration of TA in expert dialogues in this field since 2009. From our perspective, the procedural quality management succeeded in fulfilling the demands of both the qualitative and quantitative factors (see above). The project was both a successful interdisciplinary piece of research at ITA and a cross-field exercise in Technology and Sustainability as well as Privacy.

3.5 Future challenges for the Institute of Technology Assessment

Since its foundation more than twenty years ago the institute has established itself as an important network node of the European TA scene. One of the daily challenges is to walk the difficult line between TA's aim to contribute to compatible forms of technology in the sense of providing political and social consulting, on the one hand, and the institutional status within a research organisation committed to fundamental research and demanding scientific excellence, on the other hand. Budgetary problems with regard to basic funding, which entail a pressure for seeking third-party funds, have so far been overcome thanks to the high level of international networking and the large demand for TA expertise among Austrian ministries, but will be an issue also in the future. Another challenge may be to further develop the hitherto weak formal relations to the Austrian Parliament.

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Chapter 4 Parliamentary TA in Catalonia (Spain)

Paidi O'Reilly, Frédéric Adam (University College Cork), Belén López (Fundació Catalana per a la Recerca i la Innovació), Ferran Domínguez (CAPCIT)

4.1 The institutionalisation of CAPCIT

4.1.1 Political Momentum

The Advisory Board of the Parliament of Catalonia for Science and Technology (CAPCIT) is the organ responsible for coordinating information and advice on scientific and technological matters that the regional Parliament of Catalonia needs. It aims to improve the scientific and technical knowledge of Catalan parliamentarians in order to support them in their parliamentary tasks.

Catalonia is constituted into an autonomous community in accordance with the Spanish Constitution of 1978, which recognizes the right to autonomy of the nationalities and regions that make up the state of Spain. The "Generalitat" is the institution that politically structures the self-governance of Catalonia through three institutions: the *Parliament*, the *President* of the Parliament, and the *Cabinet or Government*. The Statute of Autonomy of Catalonia, which establishes the Generalitat, constitutes the basic rules of the Catalan community in accordance with the Spanish Constitution. It defines the Generalitat's powers, institutions, and finances. Catalonia governs itself in all those areas defined by the Statute; in other areas, it develops the basic rules dictated by the Spanish State.

The Catalan Parliament represents the people of Catalonia and is the most important institution of the Generalitat and from which all other Catalan institutions are created. The Parliament is made up of one house, which is independent and inviolable.

The Parliament has long showed awareness of scientific and technical developments, and over a long period it has collaborated with many institutions active in performing and disseminating science and technology based research.

The first attempt to institutionalise those relationships was taken in 1999 when the Catalan Technology Assessment Office, CACIT (Comissió Assessora de Ciències i Tecnologia) was created by the Generalitat as a committee to advise the presidency of the Catalan Government in matters related to science and technology. It was composed of prestigious representatives from the scientific, economic, and social sectors. The secretariat was held by the Catalan Foundation for Research and Innovation (FCRI).

On April 29, 2003 the Parliament urged the Government to formally link CACIT to the Catalan Parliament. The following new tasks were agreed:

- Provide scientific and technological assessment to the Parliament of Catalonia
- Provide support in assessing strategic lines of research and technological development.

In this way and standardization with other European TA offices was achieved.

In 2008 an offer of scientific and technological advice was made to the Catalan Parliament by the Catalan scientific community, who felt that the voice of science and technology was not being heard enough in the Parliament. After examining and agreeing on the need to re-organise and re-structure the scientific and technical assessment needs of the Catalan Parliament a new organ called the Advisory Board of the Parliament of Catalonia for Science and Technology (CAPCIT) emerged on the 10 November 2008 and replaced CACIT. Unlike its predecessor, CAPCIT had a more encompassing membership that now included parliamentarians as well as members from scientific and technical institutions.

It should be noted that the Catalan Parliament is the only autonomous regional parliament in Spain to have a scientific and technical advisory body. In addition, there is no parliamentary technology assessment (PTA) body attached to the Spanish Parliament. This contributes to the perception in Spain of Catalans being leaders and innovators. While a question remains over the future of CAPCIT, it has managed to survive beyond the last regional elections (that took place in November 2010). This is a positive sign as to its future wellbeing.

4.1.2 Actual Institutionalisation

CAPCIT is an organ whose brief is to coordinate the assessment of scientific and technological matters required by the Catalan Parliament. While it is a body attached to the Parliament, nonetheless, it bears a nature, structure, and set of duties that ensures that it stands out from the other bodies of the Parliament.

CAPCIT is a mixed body, whose membership is made up of nine members of parliament⁵ and nine representatives from the foremost Catalan scientific and technical institutions:

- The Institute for Catalan Studies (Institut d'Estudis Catalans or IEC), which is entrusted with a host of tasks such as being the scientific academy of Catalonia. Moreover, it is the official academy for the Catalan language.
- The Catalan Foundation for Research and Innovation (Fundació Catalana per a la Recerca i la Innovació or FCRI), which is an institution whose goal is to support research and promote public understanding of science.
- The Catalan Council for Scientific Communication (Consell Català de la Comunicació Científica or C4), which is devoted to scientific dissemination and includes various professionals and other agents like well-known journalists.
- The Catalan Association of Public Universities (Associació Catalana d'Universitats Públiques), which has three representatives from three different Catalan public universities.

CAPCIT can be considered to be a forum through which scientific institutions submit reports to members of the Catalan Parliament to assist both the Catalan Government and the various functions of the Parliament, particularly in relation to their legislative and policy making duties. Its primary focus lies with working with parliamentarians in the following topic areas: (1) Science in its broadest sense; (2) technology, Internet and communications; (3) bioethics and health; (4) environment and energy; and (5) dissemination and education in the former areas.

⁵ The 135 Members of Parliament represent all the people of Catalonia, and not only those who voted for them. They represent Catalonia. They are chosen by secret, direct, equal, free and universal suffrage in the Regional Elections: 85 in the electoral constituency of Barcelona district, 17 in Girona, 15 from Lleida and 18 from Tarragona districts respectively.

CAPCIT's stated objectives in relation to these topics are: (1) To improve the somewhat weak scientific and technical knowledge of parliamentarians and Catalan society in general; (2) To channel the participation of the main scientific and technical institutions to guide and develop the Parliament's stance on matters of science and technology; (3) To cooperate and collaborate with the institutions, organisations, professional associations, universities and other organs and institutions active in the fields of science and technology, and also to coordinate these tasks; (4) To promote co-responsibility in public policies on science and technology.

In order to achieve these objectives, CAPCIT is tasked with performing the following duties: (1) To commission reports in relation to matters on which the Parliament must pronounce judgement. These reports do not have a binding nature; (2) To propose to the Presiding Committee of the Parliament⁶ the need for reports from individual research institutions; (3) To agree among its members the setting up of specific working groups, and to set their remits and criteria of action (4) To establish forums within the Parliament for debate of issues related to the fields of scientific and technology; (5) To maintain contacts with other parliamentary institutions of scientific and technical assessment.

4.1.3 Financing

CAPCIT has no budget of its own and it, therefore, depends on existing parliament resources for support with its administrative tasks and on the members of various scientific institutions for the production of individual reports. Owing to the current financial situation and the austerity measures being imposed, this is unlikely to change in the short to mid-term. The current priorities of the Catalan Parliament lay elsewhere and in particular in addressing the financial crisis.

However, the lack of a budget limits its ability to achieve all of its objectives – such as making more parliamentarians and more members of society aware of its activities and its outputs. Because of limited resources, CAPCIT tends to focus on issues of a mid to long term nature. It does not focus on present day issues that the Parliament is actively concerned with when undertaking its day-to-day activities. In addition, the level of awareness of CAPCIT, its activities, and its output is not high even among parliamentarians. A budget would allow it to contract administrative staff which could give support such as scanning for topics, locating reports, articles, and preparing surveys for the parliamentarians and scientists. It would also enable it to prepare newsletters and other outputs which could improve the awareness of CAPCIT and its activities.

4.1.4 Quality Control

There is no centralised quality control over the activities of CAPCIT and there are no objective measures applied to determine its success in achieving its aims. Instead the standards tend to be individualistic with each institution that produces reports for CAPCIT following its own guidelines and without explicit demands from CAPCIT in terms of the way the reports are to be produced or presented (other than the topic they cover). The result is that reports are non-uniform and they differ in approach and style depending on the institutions producing them. Some are more 'scientific' than others. In addition, some reports are more informational while others are more advisory. Even though no objective measures of the performance of CAPCIT are captured, there appears to be anecdotal evidence of general satisfaction with it. The advent of CAPCIT is seen to have progressed the technology assessment agenda in Catalonia. However, in the absence of a budget its future impact and its ability to meet all its objectives are likely to remain limited.

⁶ The **Presiding Committee** is the leading body of the House. It consists of a President, two vice-presidents and four secretaries, elected in separate votes by the Plenary Assembly at the start of a new Parliament. The most important functions of the Committee are: Organising parliamentary work, interpreting rules of procedure, and managing parliamentary departments.

4.2 Institutional context of CAPCIT

4.2.1 Relationship with stakeholders

Aside from its own members and the institutions producing the reports, CAPCIT's collaboration with external parties is greatly limited. As a result it operates with a relatively low public profile. For instance, at least some parliamentarians appear unaware of its existence and work. In addition, CAPCIT and other parliamentary committees exist largely autonomously and independently of each other. This means that CAPCIT is not seen as the only 'sounding board' on issues of science and technology for parliamentarians and committees. Indeed other committees are more likely to seek their own advice from external experts when it is required. This is also true of individuals and groups of parliamentarians who often seek out their own advice (directly from independent experts rather than going through CAPCIT). However, there is also a view that once parliamentarians become aware of the work of CAPCIT then they are more likely to advocate the need for it and request its services and output. There is a view that parliamentarians do need CAPCIT as without it they are not always well positioned to make decisions on matters of science and technology. CAPCIT must play a role in tackling this deficit in knowledge.

CAPCIT's work with external stakeholders is also limited but an exception is a program called "*Parliamentarians and Companies*", promoted by FemCat, an independent association of Catalan business people that organises visits by Catalan parliamentarians to companies and encourages the ensuing dialogue with entrepreneurs and directors about their companies' needs and challenges. There is a view among these external stakeholders that CAPCIT has made a positive contribution by taking an initial step in putting science and technology on the agenda of parliamentarians and also in offering a useful point to contact for such matters in the Catalan Parliament.

However, outside of this programme external visibility of CAPCIT is largely non-existent. The reports produced for CAPCIT by individual institutions do not get published outside of the Catalan Parliament and they, therefore, remain largely unknown to the public. This makes public accountability for the work of CAPCIT, the research institutions, and the individual researchers difficult. In addition, individual researchers receive little or no feedback from parliamentarians on their reports. The result is that researchers have little visibility of the impact their contributions makes on the work of the parliamentarians.

4.2.2 Relationship with other TA and TA-like activities

Catalonia is emerging as one of the leading centers of knowledge in the Mediterranean region. Catalan spending on R&D continues to grow, and according to the Spanish National Institute of Statistics it is equivalent to 1.35% of the Catalan GDP, which is higher than the Spanish average (1.13%), but slightly less than the EU-25 average (1.77% in 2005), Japan (3.18% in 2004) and the United States (2.68% in 2004).

Scientific production results - in the form of articles or registered patents – may be indicative of the current situation and of the most recent trends in the development of Catalan research. According to the Philadelphia Institute for Scientific Investigation, Catalonia publishes almost 5,500 articles per year. This represents 0.45 articles per capita, a figure that exceeds that of many European countries. Patent application data, however, is less favourable: in Catalonia 62 patents per million inhabitants were generated in 2002, whereas the EU-15 generated 161⁷.

⁷ Source: Generalitat de Catalunya.

Catalonia's RDI system is basically made up of the Universities, the Research Centres, Science and Technology Parks Technological Centres and company research, development and innovation departments. Catalonia has an extensive network of private and public research institutions. Some fields of scientific knowledge and research - particularly biomedical and electronics - have a long tradition. They continue yielding excellent results. But there is also a strengthening in the results from fields such as genomics, microelectronics, material sciences and telecommunications. Catalonia also hosts nine large research infrastructures, of which the ALBA synchrotron⁸ has been the latest to join the system, in 2010⁹.

Technology assessment in Catalonia has up to now been mainly focused on Bioethics (through the Observatori de Bioètica I Dret, Universitat de Barcelona), studies about the socialization of technology from an industrial prospective (through the Àrea de Desenvolupament Empresarial), technological services orientated to companies (through the Observatori de Tecnologia Orientat a Empreses) and Health issues (through the Catalan Agency for Health Information, Assessment and Quality, TIC Salut). Besides this, the Institute for Catalan Studies has its own scientific publications in all areas of scientific knowledge.

The role of the Catalan Institution Foundation for Research Support (FICSR) as a member of CAPCIT is to help to focus all those initiatives towards the Catalan Parliament. In addition, CAPCIT is member of the European Parliamentary Technology Assessment network, EPTA from 2008.

4.2.3 Reflection on the institution's niche

CAPCIT is still less than three years in existence with no funding and, therefore, its impact and its role in politics and society remains limited. Its merit lays in being an initial step and a foundation for the further formalization of technology assessment practices for the benefit of parliamentarians and the Government in an autonomous and dispersed way.

It represents the first and serious attempt among any of the regions in Spain at putting together the main scientific and technological sources in a common forum at the service of parliamentary decision and policy-making.

A dual approach to technology assessment exists in the Catalan parliament whereby some parliamentarians and parliamentary groups often go outside of CAPCIT when seeking advice on issues of science and technology. While some might argue that CAPCIT should be the single point of contact for these issues, there is also the view that this flexibility in approach may be necessary in order to meet the needs of all parliamentarians. There is also some disagreement on the most appropriate nature of the reports that are commissioned by CAPCIT – some suggesting that these should be informational while others believe they should make strong recommendations on matters of science and technology.

⁸ ALBA is a facility co-financed by the Spanish government and the Catalan government. ALBA is a circular-shaped machine, called a synchrotron, that uses arrays of magnets, called insertion devices to generate bright beams of synchrotron light.

⁹ Source: CORDIS.

4.3 Organisation of work at CAPCIT

4.3.1 Organisational Structure

CAPCIT is made up of nine Members of Parliament and nine additional representatives of the main scientific and technical entities. The following are the parliamentary members of CAPCIT:

- a) The President of Parliament¹⁰, who acts as chairman of the meetings of CAPCIT. This duty may be delegated to one of the Vice Presidents of Parliament.
- b) Two other members of the Presiding Board of the Parliament.
- c) One member designated by each parliamentary group.

The Chairs of the parliamentary committees¹¹ with competence in any area in which CAPCIT operates may be called to its meetings when topics of interest to those committees are being dealt with by CAPCIT.

The following are the members of CAPCIT that represent the various Catalan scientific and technical entities:

- a) Three members representing the Institute for Catalan Studies.
- b) Two members representing the Catalan Foundation for Research and Innovation (FCRI).
- c) Three members representing the Catalan universities, put forward by the Catalan Association of Public Universities.
- d) One member of the Catalan Council for Scientific Communication (C4).

These members are nominated at the start of each legislature. Other entities, experts, informal groups, or individuals may, at the sole discretion of the President of CAPCIT, be called upon to attend meetings of CAPCIT. Either on their own initiative or at the request of members of CAPCIT, they may make contributions to those meetings.

CAPCIT has no designated staff. The preparation for meetings is incumbent on the staff working for the Parliament. Indeed, the current secretary of CAPCIT is a lawyer working within the Catalan Parliament. Moreover, administrative and service tasks are carried out by other officials from the Parliament.

On the other hand, each of the scientific and technical institutions represented on CAPCIT have their own scientific directors. Consequently, if a decision is made within CAPCIT for one of the scientific and technical institutions to be charged with drafting a report, this institution undertakes this initiative using its own staff and resources.

¹⁰ The **President of the Parliament** represents the House, chairs all discussions and debates in accordance with the Rules of the House, which include establishing and maintaining order in the House. When absent or unable to take the chair, the President is substituted by the vice-presidents in consecutive order. The secretaries supervise and authorise the minutes of the: (1) plenary assemblies, (2) Presiding Committee, and (3) Board of Spokespersons. They also assist the President of the Parliament during sittings in ensuring that debates take place in an orderly manner and the voting procedure is followed, as well as assisting in carrying out the work of the House.

¹¹ **Parliamentary Working Committees** are small groups made up of Members of Parliament. Membership is in proportion to the number of members in each parliamentary group. The working committees specialise in a particular issue dealt with by the House. Much of Parliament's work is handled through the committees. The committees formed by Parliament may in some cases be legislative. Legislative committees are those formed and designated as such by the Plenary Assembly and the Committee for Rules of Procedure, which drafts and revises the Rules of Procedure. During the week following the investiture of the President, the Presiding Committee and the Board of Spokespersons proposes to the Plenary Assembly the number and scope of legislative committees, which must be approved by an absolute majority of the Plenary Assembly.

4.3.2 Priority Setting

CAPCIT itself is responsible for discussing and making decisions on its own work plan and on the issues about which it is necessary to prepare technology assessment (TA) reports. So members – both parliamentary members and the members from scientific and technical institutions – jointly decide what issues should be focused on and which of these need to be addressed in a report. Up to this point on average there has been no more than two meetings in any year. The members of the institutions are also involved from the outset on giving advice on the suitability of devoting time and resources to specific topics. But in deciding its work plan, CAPCIT may also take requests from: (1) The Board of the Parliament of Catalonia; and (2) The Committees of the Parliament of Catalonia.

Once CAPCIT decides that it is necessary to address a particular topic or the issue has been put forward to the body by one of the above bodies, a decision needs to be made as to whether the report will be produced and if necessary who shall be responsible for producing it. The various alternatives are that: (1) One of the scientific and technical institutions represented in CAPCIT is designated to produce the report; or (2) Production of the report should be commissioned to a different scientific and technical institution and proceedings will be initiated to appoint this institution.

4.3.3 TA Approaches

The method used at the moment by CAPCIT is the approach of expert-based analysis to evaluate the consequences of scientific and technological advances and thus to provide the most neutral support to decision makers. CAPCIT delegates all responsibility for the production of the reports, including the choice of assessment method, to the institution charged with undertaking the research.

Up to this point, neither the opinions of the general public nor those of different stakeholders (other than those of scientists) have been considered. However, in 2010 CAPCIT supported a citizen forum called *Young Catalans Science Parliament*, which was organised locally by FCRI and funded by the EU, in which four controversial and modern topics about Life Sciences were discussed by teenagers between the ages of sixteen and eighteen. The Catalan parliamentarians were handed out the resolutions adopted during the forum.

4.3.4 Overview of Projects and Output

Since its inception, CAPCIT has worked on the following areas:

- a) *Genetically modified organisms* (GMOs or transgenic). A popular legislative initiative was presented in the Parliament which sought to ban genetically modified crops. CAPCIT decided to call for three separate reports on the topic from various scientific institutions represented on CAPCIT. These reports were presented in the plenary session of the Parliament before discussions took place on the issue.
- b) *Human papillomaviruses*. Proposals had been submitted in the Parliament to restrict vaccinations for this virus and more information was sought on the issue before making a decision. Two reports were made – one to document the different actions undertaken in other European countries and the other centred on scientific aspects.

- c) *Nanotechnology*. Again three reports were made – one to document the information available from other TA European offices, another to document social perceptions, and the third to deal with scientific aspects.

In each case, the reports were sent to all the representatives of the parliamentary groups but they were not made directly available to the public. In addition, CAPCIT has not undertaken any kind of public debate or participation on these issues. The reports commissioned are always handed out to the appointed representatives of each political party in the current legislature period. Thereafter each party decides its own strategy.

4.3.5 Reflection on Criteria of Success

CAPCIT has not defined any objective indicators of success nor implemented a way to measure the satisfaction of the parliamentarians or the impact of its reports on policy-making.

4.4 Case study: GMOs

Catalan Popular Legislative Initiatives (PLI) constitute a procedure of direct involvement by citizens in bringing about regulations by presenting at least 50,000 signatures. In July 2008 a PLI was presented in the Parliament, which sought: a) To ban genetically modified crops in the territory of Catalonia; b) To guarantee the adequate labelling of produce; and c) To promote the research of the GMOs possible effects. The transgenic issue is highly controversial in Spain because it is the first producer of GMOs in Europe, and Catalonia is the second largest region in Spain in terms of land mass covered by GMOs. Many ecologist associations, farmers, and citizens are sensitive towards the possible consequences that the introduction of GMOs could have on public health and on the environment. The promoters of the PLI, an ecologist platform called *Som lo que sembrem* (We are what we grow) were supported by more than a hundred thousand signatures of independent citizens.

The signature collection procedure for a PLI is done using traditional sheets. The time-frame for collecting signatures is 120 days once the PLI has been accepted, with the possibility of a 60 days-extension if considered justified by the Parliament Board. Guaranteeing the signature collection procedure is the responsibility of the municipal secretaries, Electoral Census Offices and also the Catalanian Statistics Institute. In order to validate a signature, an essential requirement is that the signatory be older than sixteen years of age and be registered on the Electoral Census, and this must be demonstrated by means of certification. This certification confirms the capacity of the signatory and avoids multiple signatures by a single citizen.

Regulations on PLIs include:

- Organic Law 3/1984 of 26 March on Popular Legislative Initiative, amended by Organic Law 4/2006 of 26 May, Article 1, 7, 9, 10, 11 and 12.
- LAW 1/2006, 16 February, on Popular Legislative Initiative.

CAPCIT started its activity coinciding with the presentation of this PLI and decided in its first meeting¹² to call for three reports on the PLI topic from various scientific institutions represented on it to support the discussions to be held in 2009 during the plenary session of the Parliament of Catalonia.

The reports were commissioned to:

- Institute for Catalan Studies (IEC). The report titled *Transgenic Food: A Scientific Approximation* was elaborated by expert biologists and it addresses the subject from a scientific perspective without giving any opinion or advice. It consisted of an introduction to plant technology and modification throughout history, a vision of the health, environmental and socio-economical effects, basic research and technological applications, scientific recommendations and conclusions.
- Catalan Foundation for Research and Innovation. This report was titled *Actions Undertaken by European PTA Institutions about Transgenics*. This report was made by staff belonging to the FCRI, a biologist and an information officer. It consisted of an introduction to the current legislation on transgenics in Europe, and an analysis of the reports and actions commissioned by European PTA institutions on transgenics during the last decade and the conclusions reached in those studies.
- Catalan Council for Science Communication (C4). This report was titled *How does Society Perceive Transgenics?* This report was made by a member of the C4, a biologist and an expert in science communication, and it treats the social perception of transgenics among scientists, health experts and patients, farmers, ecologists general public, and the media. The industrial sector was omitted in order to avoid accusations of lack of partiality. The sources used were other national and international reports on the matter, national and international news, Eurobarometer data, and scientific monographies.

As described above, the three reports were the result of the integration of expert-based analysis of documentation and scientific literature and internal consultation with experts.

Each party's¹³ representative in CAPCIT received the three reports and each party reached their own decision. There appears to have been no collective meeting between the experts and the parliamentarians in relation to the individual reports. In 2009, the Plenary of the Parliament, after analysing and discussing the reports, decided against the further processing of the PLI to the Catalan Parliament, a decision which was highly controversial for the promoters and supporters of the PLI and had media impact. The reports were considered by the promoters of the PLI as biased in favour of GMOs, with the exception of that of the FICSR, considered as neutral.

None of the reports was made public by the Catalan Parliament, although the association which promoted the Popular Legislative Initiative, *Som lo que Sembrem (We are what we grow)*, somehow had access to them and subsequently uploaded the reports on their website together with their comments.

¹² November 2008

¹³ All the parties with representation in the Catalan Parliament

4.5 Future challenges for CAPCIT

One of the main challenges facing CAPCIT is to firmly establish itself as a body of the Catalan Parliament par excellence. The regularity of the institution's meetings and the number of issues it deals with will depend primarily on the interest shown by the bodies and the members of the Parliament. The absence of a budget is, however, a major constraint on CAPCIT and its ability to achieve its various objectives.

Another of the challenges facing CAPCIT is to set out a clearer definition of the role to be played by Catalan scientific and technical institutions in its meetings and in the preparation of the reports they draw up. One of the perceived strengths is for the various institutions to provide their opinion on the topics to be addressed; even so, when it comes to choosing the working issues it should not be overlooked that the decision-making must be conducted from a political standpoint to a certain degree.

Another challenge is to implement participatory TA through embracing a wider group of external stakeholders (including the public) in order to broaden the political debate, especially on sensitive issues for citizens such as GMOs. This should include publication of the reports.

Chapter 5 Parliamentary TA in Denmark¹⁴

Marie Paldam Folker, Lars Klüver, Anders Jacobi (all DBT) and Mara Almeida (ITQB)

5.1 The institutionalisation of the Danish Board of Technology

Being around for more than 25 years the Danish Board of Technology has been through many institutional changes – from being an experiment, to becoming “permanent”, and lately to be transformed into a private non-profit foundation. At the time of writing, the form of the relation between the foundation and the Danish Parliament is to be determined, and is going to be decided upon on the background of a coming report from the Committee on Science, Innovation and Higher Education in the Danish Parliament.

As part of the Danish national research budget adjustments for 2012, the newly elected governing coalition of three centre-left parties decided to take away the yearly contribution to the DBT from the national budget. The stated rationale for abolishing the DBT was to divert the board's annual funding of about 10 million kroner (approximately 1.3 million €) to an expansion of the research budget of 1 billion DKK (140 million €). The research agreement was reached in agreement by all parties of the Parliament, represented by their research speakers.

Since the Danish Board of Technology was established by law the Board could only be closed by law. Thus, the Government launched a public consultation (hearing) on a draft Bill on the closure of the Danish Board of Technology. The plan to close down the DBT was met with overwhelming opposition from individuals, organisations and the media at home and abroad. The hearing resulted in 111 answers and only one answer supported the abolishment – 100 criticised the decision and the way it had been taken, many pointing on the lack of an evaluation in the process. Opposition to closing the DBT came from Danish universities, international academia, institutions on technology assessment, innovation, democracy and research institutions world-wide, local and regional governments including the Lord Mayor of Copenhagen, CSOs, industry and their associations, labour unions and their associations, foreign parliamentarians, and many others. Also media was very critical and two of the most recognised international scientific journals Nature and Science both had critical articles, in Nature in the form of a very critical editorial.

On the background of this public opposition the DBT suggested to the minister on science to either continue the DBT with a new budget from 2013 or to transfer the DBT into a private foundation. The latter suggestion was accepted and serious negotiations about how to find a way to continue the work of the Danish Board of Technology began. The negotiations were about establishing a set of aims of the foundation, which could continue the aims of the DBT, including a focus on elected political decision makers and the work form of the DBT, and about making economy available that could make sure that the foundation could survive in its establishing phase of 2012-13.

The form of private foundation chosen for the DBT is in Danish termed an “erhvervsdrivende fond”, which is a non-profit foundation that can run and own commercial activities of which a positive economic result only can be used for a set of common good aims defined in the constitution of the foundation. This means

¹⁴ This report is based on institutional archives and web sites, previous descriptions and interviews with stakeholders and 'insiders' of the Danish Board of Technology. All interviews were conducted prior to a 2011 financial agreement of the Danish Parliament that included the abolition of the yearly public grant to The Danish Board of Technology.

that the DBT will live on the economy it can create through commercial activities, research funding, externally funded projects and voluntary contributions.

The private foundation has taken over all activities and has continued the work, the role and the spirit of the Danish Board of Technology by June 20, 2012.

5.1.1 Political momentum

Danish technology assessment took conceptual roots in the midst of widespread discussion and controversy in the 1970s and 1980s surrounding controversial issues such as nuclear energy, biotechnology, and a growing concern on the side-effects of information technology at the work place. For example, strikes were held against the introduction of new technology in production processes and social movements emerged against nuclear power. Various forms of protest materialized in the adoption of the Environmental Act in 1974, a so-called technology agreement among trade unions and employees giving workers a say in decisions about the implementation of new technology¹⁵ and the final decision to abandon nuclear energy in 1982 following a long heated public debate.

Before the institutionalisation of the DBT in 1985, technology assessments were carried out as research activities by universities, mainly for Danish industry and trade unions. In the early 70ties and 80ties the Technology Development Programme of the Technology Council of the Ministry of Industry and the Technology Assessment Initiative of the Research Council on Social Sciences were major sources of funding for TA activities. Two accounts on technology assessment for the Ministry of Industry expressed, however, an interest in a more fundamental shift in the mode of governing the techno-scientific developments.¹⁶ In these accounts the governance strategies of the past are challenged by the outline of a deliberative model where decisions are taken after careful assessments actively involving stakeholders such as interest organisations, the industry and the general public. A so-called alternative, red-green majority in Parliament managed to establish the Danish Board of Technology (Teknologinævnet, later Teknologirådet) and the Danish Ethical Council (Det Ethiske Raad); institutions that both were to undertake an advisory function in relation to the Parliament and stimulate public debate on different aspects of science and technology. Interviewing Steen Gade, Member of Parliament and one of the political 'founders' of the Danish Board of Technology, he explains: "Ritt Bjerregaard (MP of the Social Democratic Party), Lone Dybkjaer (MP, Social Liberal Party) and I (MP, Socialist People's Party) took advantage of a situation where the ruling Conservative-Liberal minority coalition had agreed on a bit of space for initiatives coming from the opposition. The three of us were profoundly inspired by the Office of Technology Assessment of the US Congress and what was going on in the Netherlands¹⁷. Our three political parties were responsible for the decision to reject nuclear energy in Denmark. We began to realize the need for debate to tackle the technological choices facing Danish society at that time in the beginning of the eighties. Ritt Bjerregaard met a lot of opposition in the trade unions and in the industries there were widespread scepticism but we managed to set up an advisory body of technology assessment very close to parliament with a parliamentary committee as supervising authority independent of the ruling government".

As Steen Gade mentions, the Danish parliament was inspired by the US Office of Technology Assessment (1972-1995) as an institutional frame of dealing with controversial new technologies. The Danish model

¹⁵ Andersen and Jaeger 1999: 150, *Danish participatory models Scenario workshops and consensus conferences: towards more democratic decision-making*, Science and Public Policy (1999) 26(5): 331-340

¹⁶ Teknologistyrelsen, 1984, *Organisering af teknologivurdering i Danmark*, Copenhagen; and: Teknologistyrelsen, 1984, *Teknologivurdering i Danmark – betænkning udgivet af et udvalg under Teknologirådet*, Copenhagen.

¹⁷ The establishment of NOTA – later Rathenau Institute.

became quite different, however, since it was based upon a strong element of public debate exhibiting three core elements of the Danish democratic tradition: 1) an egalitarian, consensus-oriented and participatory ethos dating back to the *folkeoplysning* or ‘people’s enlightenment’ movement of the 19th century (Agger et al. 2012, Horst & Irwin 2010, Klüver 1995) 2) a deliberative democratic tradition of mixing representative and participatory forms of engagement (Andersen & Jaeger 1999, 333, Agger 2012, 47) and 3) a strong civil society with well-established negotiations, agreements among labour organisations and a range of NGOs and civil society organisations and associations taking part in societal discussions. Steen Gade explains: “By establishing the DBT we partly politicized technological choices. The DBT is placed close to the political system, but is not political in itself. Being placed close to parliament, although not political in itself, the DBT has provided a space for politicians to handle technological choice. By enabling technology assessments of a given technology – what does it do and what does it not do – the DBT facilitates political choices that can have a big impact on technological developments.” On the institutionalisation of the DBT, Director Lars Klüver explains: “When the DTB was established in the mid 80ties, technology was regarded very important from a societal point of view, both as a problem creator and a problem solver. In the Danish context it was, and I think it still is, very important that finding solutions and analysing these kinds of issues should be done in an involving and engaging way. Kind of a 360 degrees approach where everybody are seen upon as some kind of experts, everybody in society can contribute, everybody in society has a right to contribute to this discussion. So I see the DTB as an organisation that has to provide society with input from all kinds of stakeholders with a very broad stakeholder concept into the discussion and the analysis on how we want to use technology.”

The aim of the first 1985 time-limited law on the Danish Board of Technology (Teknologinævnet) was to establish an independent technology assessment institution with a twofold task to initiate and promote the public debate over possibilities and problems related to new technology; and to strengthen and widen the knowledgebase behind parliamentary decisions in the field of science and technology. Major proponents were the Social Democrats and the trade unions who expressed a need for an institution connected to and directed by parliament, as an expert research and analysis tool that could serve as a counterweight to the work of government and its administration (the OTA model). The Social Liberal Party supported this agenda but reckoned the need for comprehensive non-partisan technology assessment in the tradition of public enlightenment emphasizing the importance of public debate and democratic tradition of enlightenment as a key to Danish technology assessment. The organisational structure of the statutory board consisted of a nine-member parliamentary committee (the Committee on the Board of Technology), a Board of fifteen members in charge of resources and strategic direction and a secretariat that carried out the activities approved by the Board.

During the period 1985-1995 a series of time-limited laws succeeded each other. The organisational structure remained unchanged with a parliamentary Committee on the Board of Technology as the political link to parliament, an independent Board and a Secretariat (that grew from five to thirteen staffers).

In 1993 the DBT was evaluated which led to a new law¹⁸ in 1995. Following the Danish Constitution, which separates clearly between the executive and the legislative power, the Parliament – Folketinget - should not have institutions directly connected to it. Thus, a structure was chosen with an economic and administrative connection to government (administrative supervisory within the Ministry of Science). A name change accompanied the new law from *Teknologinævnet* to *Teknologirådet* (*from a board to a council – although the English name of being a board remained the same*). In this new law of 1995, the goals of the DBT remained unchanged, but an explicit advisory function to parliament as well as to the government was added.

¹⁸ Law on the Board of Technology. The Danish Parliament, Law No. 375 of 14 June 1995.

The parliamentary Committee of the Board of Technology was abolished; instead DBT got a standing committee (Committee on Science and Technology) as a direct link to the Parliament. Another new element was a Board of Representatives consisting of 40-50 persons from different organisations in the Danish society. An obligation to have annual meetings with relevant parliamentary committees was added. The overall mission, as defined by the Board of Governors, was to contribute with knowledge, constructive debate and solutions to existing and future problems and opportunities in the field between technology, society and the individual, with a local, national as well as international perspective.

After 1995 the DBT was composed of a Board of Governors, a Board of Representatives and a secretariat. Ten members and the chairman of the Board of Technology sat on the Board of Governors. The Minister for Research appointed the chairman and three members.¹⁹ The Board of Representatives was composed of up to 50 members and served as a forum for open debate on topical issues related to technology assessment. This included proposing new initiatives and discussing initiatives already launched by the DBT. The Minister for Research appointed up to ten members following a consultation with the Board of Governors. The other representatives were appointed by different organisations in the Danish society.

Since 1985 growing political support has guaranteed the consolidation and expansion of the DBT, with a minor blow, however, in 2001, when a new right-wing government led by the Liberal Party suggested the closure of a wide range of committees, councils and advisory boards. The DBT appeared on the government's so-called 'death list', but escaped closure due to a swift parliamentary rescue, suffering however a substantial budget cut in the process.

In November 2011 the Committee on Science, Innovation and Higher Education negotiated an expansion of the research budget and as part of the financing plan the grant for the DBT was abolished. The political situation around this decision was very complicated, and in the aftermath in the months after the research agreement was decided it turned out that the DBT still enjoyed broad political backup in Parliament. Besides, it became clear in the hearing process connected to the draft bill that the national and international support to DBT was much larger than any Danish decision-maker had expected. These facts made up the political background for the establishment of "Fonden Teknologirådet" – the Danish Board of Technology Foundation, which took over the work of the DBT by June 20, 2012.

5.1.2 Actual institutionalisation

At the time of writing the DBT has only had two months of existence in the new form as a foundation. This chapter, therefore, rests on the stated aims of the constitution of the foundation, and on the praxis of DBT, taken over by the foundation. The foundation will surely change and add praxis during the coming years, but the declared starting point is the praxis of the DBT.

The Board's formal tasks were copied into the aims of the foundation: To follow technological developments, to carry out studies and comprehensive assessments on the possibilities and consequences of technology for society and the citizen, to initiate independent technology assessments and to communicate the results of the work to parliament, government, other political decision-makers in society and to the

¹⁹ The other members are appointed by the Minister on recommendation from one of the following organisations: The Industry and Trade Development Council, the Salaried Employees' and Civil Servants' Confederation, the Danish Confederation of Trade Unions, the Danish Employers' Confederation, a joint representative of the National Association of Local Authorities and the Danish Association of County Councils, the Danish Council for Adult Education and the Danish Research Councils.

Danish population in order to support and further public debate on technology²⁰. However, because of the corporative element of the foundation, the aims were expanded as to allow for a wider portfolio of activities of the foundation in the future. The constitution mentions that “The main aims are to execute research, analyses, assessments, dialogue, communication and advise on societal issues, including the use of knowledge and technology, in Denmark as well as internationally. The main activities of the foundation will be based upon execution of work upon remuneration in the mentioned fields. The foundation can execute its activities upon grants as well.”

The foundation is non-profit in the sense that no person can draw profit from the foundation. If the foundation will be abolished and there will be a remaining fortune after clearing of all obligations, then this fortune will have to be used for common goods aims.

The foundation is established in the private domain under a specific regulation for foundations and funds. This regulation sets down some rules about the minimum capital in the foundation, how the capital has to be managed, and demands to the composition of the governing board of the foundation.

The DBT Foundation has a 6-8 members governing board and during the first 1½ year a Board of Representatives will be established. The Governing Board is for the first 1½ year defined in the constitution as an intermediary board, which is to set the praxis of the institution. After 1½ year, the board will be elected after the following rules:

- a. Members of the Board of Representatives elect 2 members.
- b. 1 member is appointed by the old board after consultation of EPTA or a comparable international organisation – this member has to be Danish, Swedish or Norwegian speaking.
- c. The employees of the Board appoint 1 member, which is not an employee.
- d. The employees appoint 1 member amongst themselves, but not the director.
- e. The Parliament can appoint 1 member if it wishes so.
- f. The rest of the members are appointed by the old “sitting” board.

The role of the Governing Board is mainly to employ the director, to oversee the administration of the foundation and to define the strategy. If the foundation will receive grants to be used by its own decision, then the Governing Board will be in charge of laying out principles for this.

The Board of Representatives will probably receive a more prominent role than was the case in the former DBT. Since the principles of this role will be settled by the Governing Board during the first 1½ year, the following roles should be regarded as options, which may look different in the future.

A right to appoint members to the Board of Representatives will be stated in the constitution of the foundation. It is envisaged that 25-40 organisations will be given such a right. The Board of Representatives will have some main tasks in appointing members to the Board of Governors, overseeing the work of the

²⁰ Profile of The Danish Board of Technology, available at http://www.tekno.dk/subpage.php3?page=statisk/uk_profile.php3&toppic=aboutus&language=uk.

foundation, involve themselves in fundraising for the activities of the foundation, and to be active participants in the wider network. Such a “wider network” will be established in order to allow for an active involvement from MPs an regional or municipality elected, representatives of government institutions, civil organisations and institutions industry and commerce, other funds/foundations, persons with a special interest in the foundation, and researchers/experts.

A main work mode of the Board of Representatives is envisaged to be focused on a yearly assembly and, with the wider network, many thematic meetings per year. The thematic meetings will bring knowledge to the members and provide an opportunity for a common search for activities for the foundation inside the theme – and a plan for cooperation and financing the activity.

As mentioned, it is the declared intention of the DBT Foundation to continue and expand the praxis of the DBT. It is premature to describe how this will change, so the following description explains the heritage from the DBT.

The DBT accomplish its objectives by means of ‘expert assessments’ through ad hoc multidisciplinary project groups facilitated by the DBT and ‘participatory assessments’, which involve stakeholders and members of the public (such as scenario workshops and consensus conferences). Interdisciplinary expert assessments and results from participatory processes are directed to decisions makers in politics as well as to the wider public. Also, the DBT developed methods for bringing the assessment process close to Parliament itself through innovative forms of parliamentary hearings and time-limited committees (Future Panels).

The Danish Parliament's Research Committee was the Board's liaison to the Parliament, and may continue as such to the foundation. But the Board can work together with and/or give advice to any committee in Parliament.

The DBT operates within a dynamic interplay between independence from and representation of stakeholders. Both stakeholders and insiders unanimously state the value of having independence from Parliament, government and vested interests. Soeren Duus Oestergaard, Former Member of the Board of Governors for two successive periods emphatically state that "we work with an arm's length from the parliament. There's no particular government or industry position that have some direct interest in, or can actually push the board's decision". According also to Ida-Elisabeth Andersen, senior project Manager of the DBT: "What is distinctive about the DBT is that we are not bound by the politicians. We can decide on an issue without asking the parliament, and this is very important."

The DBT Foundation must be expected to change status with regard to independency. On the one hand it will be dependent upon financial support from actors in the Danish society. This clearly demands the foundation to have a strong policy on ethical code of conduct, which aims at keeping the work “at arms’ length” from those who pay. The DBT succeeded to do that when receiving external financing for projects, and the foundation will continue that praxis. On the other hand, the institutional setting of the foundation is more independent than that of the DBT, in the sense that a foundation is a private organisation outside the range of public policy, and in the sense that it cannot be abolished by political decision.

5.1.3 Financing

The DBT received an annual public grant of around 10 million Danish kroner (1.4 million €) stipulated in the national budget. During the last 10 years it has been a stated policy of the Board to increase the relevance of the Board making TA for and with external actors. This activity constituted a comparable turnover, so that the yearly turnover was around € 2.8 million.

The DBT Foundation will begin with an expected turnover of 1.4 million €, based upon the same externally financed activities as the DBT.

The foundation received at the transfer of the DBT to the foundation around 1 million euro as a compensation for the costs of the change of institutional setting and as a contribution to an expected budgetary deficit in 2012-13. At the time of writing the Danish parliament is going to make a report about the future relation between the foundation and the parliament, and it is uncertain if this will turn out having financial consequences.

5.1.4 Quality control

The Danish Board of Technology carry out technology assessment in which administrative functions, operation of communications and of customers, dissemination and communication, implementation of methodological expertise and the creation of know how is involved. In all of these areas, the Board finds it vital to be able to vouch for quality. In that regard, the Danish Board of Technology utilizes a string of tools aimed at securing a certain quality of services:

Assuring quality of processes: Part of the Danish Board of Technology's methods is based on invited experts and stakeholders creating contents and results during different forms of dialogue, be that working groups, workshops, hearings, conferences, etc. To create reliable results from such processes, a high standard of management is required. The Danish Board of Technology utilizes several different tools in assuring the quality of processes:

- Detailed description of topics in the planning of work schedules
- Detailed project description during the project launch
- Manual containing process description, check lists and collections of examples. The secretariat of the Board has internal manuals for the most important methods and processes
- Continued development, reviewing and updating of methods. Participation in international method research and networks
- Internal education of project managers in TA methods. Partly education of new employees, partly during twice yearly seminars focusing on qualifications and methods involving all project managers
- Sparring with other project managers in teams
- The involvement of external planning groups who, amongst other things, supervises the secretariats completion of projects
- The involvement of external process consultants

Assuring quality of content: The content of technology assessment can take the form of research, as interdisciplinary researchers contribute with knowledge, the combining of which results in new knowledge. Content is created by informed, democratic dialogue, wherein knowledge, interests, values, norms and political judgment must take part. Therefore it is not always possible to judge technology assessment based

on scientific criteria. The form of content of technology assessment calls for different tools in different situations:

- The Danish Board of Technology decides, based on each project, whether specific steps are needed in order to assure quality of content
- The Board has the possibility of using 'Peer Reviews'. This would be relevant if a project involves written, professional reviews and analyzes, especially if these are made by a small number of researchers/experts
- A project might include special seminars, in which the participants assess and correct the preliminary project results
- The Board always guarantees a balanced composition of expert groups involved in the project, assuring the inclusion of possible opposing professional contributions in the process. Thereby the process itself acts as an assurer of quality
- The Board aims at using the best qualified, available expertise in its activities

Evaluation: The Danish Board of Technology makes use of different forms of feedback and evaluation:

- Internal evaluations. The planning group of a project wraps up and evaluates during the completion of the project
- Evaluation of projects by participants, especially when a project utilizes new methods. This might take the form of questionnaires or interviews with participants
- User surveys, for example in connection with the Boards communication products – homepage, magazine, newsletter, email service etc.
- Feedback on satisfaction. Especially useful when a certain activity has been aimed at a specific, smaller scale 'customer' – for example a parliamentary committee
- Annual report meetings. Annual feedback is collected from the Boards representatives and from the Science, Education and Further Education Committee of the Danish Parliament (Folketinget)

5.2 Institutional context of the Danish Board of Technology

5.2.1 Relationships with stakeholders

Apart from the involvement of stakeholders in its organisational setup (Board of Governors and Board of Representatives) the DBT involves a large number of stakeholders in its project activities. During its 25 years history the DBT has developed a substantial network in administrative and political bodies at local, regional, national and international level, in industry organisations, trade unions, NGOs, civil society organisations, academia and media.

The DBT pursues informal contact to MPs through its Director Lars Klüver, its Chairman of the Board of Governors Annette Toft, and the vice-chair Hanne Severinsen, who is a former MP. The Board of Technology communicates and co-operates directly with the relevant parliamentary committees who seek advice on examining a specific subject. This advice can consist of answering specific questions from members of parliament, making information meetings for committees, arranging hearings for parliamentary committees, or providing an issue of the briefing note 'From the Board to the Parliament'. It is expected that the coming report of the parliament will suggest how the DBT Foundation can continue to bring such services to the parliament.

Referring to the Habermasian concept of the public sphere, where information is discussed among citizens and politicians without one party controlling either side, Soeren Duus Oestergaard explains: "What we're trying to do is actually to have an open discussion here, where you have a mutual respect for the outcome of it. This requires that all the parties who are supposed to play a role in any kind of process are actually represented in some way. In the Danish case we have it [representation] on two levels. We have the Board of Governors, which of course cannot represent every kind of interest because of the limited number of trustees. But then you have the board of representatives which is a very large group representing a host of interests." Thus, although officially being a PTA organisation, the DBT is in fact more than a parliamentary TA institution. Director of the DBT Lars Klüver explains: "We don't always see parliament as the most important actor, and I don't see that as a problem, basically that's a positive thing. You can easily take a project in the DBT and say this project did not have any contact with parliamentarians so it is a failure. But were parliamentarians actually the most important actors here? We should contact them, when we have something of specific relevance to them. And we shouldn't contact them about everything. We make projects which are basically learning situations for actors. Setting up situation timespans, where they can have a dialogue and they can begin to re-orientate themselves on an issue. I think we are also a societal TA institution. I don't want to be measured on the idea that all projects should be relevant for parliament because we don't make all projects as if they should."

The Board of Technology published a range of publications with a view to stimulating debate on technology. The e-magazine *TeknologiDebat* contained news stories, background information, articles and debates, all primarily related to the projects of the Board. Stakeholders and partners are reached through the Board's monthly e-newsletter *TeknoNyt*. The Board publishes reports, books, booklets and pamphlets. MP newsletters with international relevance are translated in English. Project reports in Danish and English are available for free download and purchase in hard copies.

The DBT website is a very important communication tool for the Board. It has around 1 million visits a year and some publications are downloaded at figures exceeding 250.000. The website delivers all publications of the Board, web pages on all projects, podcasts from conferences, hearings, workshops etc.

5.2.2 Relationships with other TA and TA-like activities

Senior Project Manager Ida-Elisabeth Andersen recalls a time in the early 1990ties when TA in Denmark was a booming activity field, herself being one of the core protagonists: "When I started out in the business, there was money for TA from the state, from foundations, and from some institutions. There was a big TA landscape in Denmark both in the trade unions, at universities, and other organisations. Now I can only point to a few university departments or research centres where they do what I will call TA work/research, but this is without the political perspective, which we have at the DBT."

The DBT is an active member of the European Parliamentary Technology Assessment Network EPTA²¹ and partner in the European Technology Assessment Group (ETAG)²² contributing to the Science and Technology Options Assessment Panel (STOA) of the European Parliament.

It has been a stated policy of the DBT to support the development of TA and TA-like activities internationally. Especially the director Lars Klüver has been involved in advice, workshops, conferences etc. on the institutional and methodological aspects of TA and TA-like activities internationally. This has resulted

²¹ www.eptanetwork.org/

²² <http://www.itas.kit.edu/english/etag.php>

in a world-wide network with TA and foresight institutions, academia, NGOs, governmental and parliamentary institutions, and many personal contact points.

5.2.3 Reflection on the institution's niche

Having the twin purpose of initiating and promoting public debate over possibilities and problems related to new technology and strengthening and widening the knowledgebase behind parliamentary decisions in the area of science and technology, and the praxis of serving a broad range of societal decision-making processes, the Board sees it as its 'niche' to act as a bridge builder mediating knowledge exchange, dialogues on values and interests, and common search for solutions. The Board acts as an intermediary and a translator between experts, citizens, stakeholders and politicians. The 'niche' of the institution is its independent advisory to decision-makers with a long term strategic and international outlook exceeding short term political agendas, serving societal interest, contributing to societal cohesion and sustainable choices concerning technological trajectories.

Political role

The Board of Technology has acted as advisor to Parliament and the government, and future will show how this role will develop.

Looking back at the role of the DBT, advisory activities were centred on answering specific questions from MPs, organizing hearings for parliamentary committees or approaching committees or ministers in relation to topical technological issues mainly arising from the project activities of the Board. The establishment of the DBT fulfilled a need for non-party, independent and consistent advice on social implications of controversial technology issues such as GMOs, nuclear energy and environmental pollution. During the course of time, the Board has had to defend its institutional role in society stressing the need for independent advice, representation of stakeholders and societal role in creating public debate and insight into ordinary citizen's view of technological matters as an important component of political decisions.

The political impact of the Board has been dependent on the structure and composition of Parliament and the quality of personal contacts with politicians interested in DBT projects. The work of the Danish Board of Technology has generally been highly appreciated by Danish MPs and increasingly by politicians in the regions and municipalities. Denmark has, though, through the last 10 years been characterized by a strong divide between left/right in politics – often referred to as block politics. This has decreased the level of dialogue and common actions across Parliament, and accordingly decreased the call for independent assessments that contribute to finding political common ground. This tendency has been very clear with regards to a remarkable decrease in the call for parliamentary hearings during the last 5 years. This has limited the number of instances where the Board has been directly involved in political debates in the Parliament – and thereby limited the visibility of the Board. The need for closer relationships with the Parliament is reflected in the interview with MP Steen Gade and interviews with insiders. In general relations with Parliament are friendly and informal. As Director Lars Klüver points out: "It meant a lot that we could contact the parliamentarians directly, which basically I have a feeling we were the only governmental organisation in Denmark that could do. Everybody else have to go through the minister. We didn't have to go through any formal structures. It was extremely important for the DBT that we had freedom to contact them without going through filters and gatekeepers." The future will show if the DBT Foundation will have the same direct relation to the Parliament.

Societal role

From an outsider's perspective Professor at Roskilde University Birgit Jaeger stresses the need for societal reflection on technological development. She comments on the tendency of politicians to relegate technological choices to 'technical matters for administrators' downplaying the political responsibility for technological change: "I think it's important to have an institution like the DBT to keep on looking at these questions, and bringing them up front in political discussions and say: Well, things are going on here in the development of technology, in say climate changes. It is a very complicated technological scientific matter, but we have to reflect on them, we have to make policy on them, we have to take care of these things."

Although stressing the value of a science/society dialogue as input to the design of STI governance frameworks, Special advisor Anders Hoff of the Danish Agency for Science and Innovation hints at some of the difficulties of the DBT in setting a strong agenda of a science and society dialogue: "We haven't had a beef scandal in Denmark and I think we actually need one if you want to really promote a science/society dialogue. On the one hand there's a very strong believe in scientific progress in Denmark and a lot of trust in science and on the other hand there's a strong opposition still on researchers asking themselves 'why should everyday Danes be allowed to be involved in a discussion on my work?' There is a strong academic culture in Denmark in the sense that researchers want to be left alone. So that's challenging."

Eva Weinreich, Secretary of the Democracy Committee of the Association of Danish Regions, particularly stresses the importance of citizen involvement in the future governance of local and regional democracy in health care: "I mean we're trying to change the debate within the healthcare discussion from quantity to quality, and one very important parameter is involvement. Involvement is necessary in the future in order to keep the democracy moving. For us it's getting more and more important to think of ideas of how we can involve citizens, how we are able to get in dialogue with our citizens, both as citizens and patients and as coming voters in an election and the DBT has played a significant role in our endeavour to achieve that".

Being a house of methods

A strong element in the delineation of the DBT niche is the idea of being 'a house of methods'. The Danish Board of Technology has been involved with experimentation and research in understanding the social implications of technology. Decisions on new technologies are hampered by uncertainties, and by a web of interests that usually are difficult to disentangle. Ordinary citizens are kept at a distance and seldom considered competent in giving their voice. The Board has developed specific methodologies and gained competencies for taking on board the views of lay citizens and for staging dialogues and debate between citizens, experts and political decision-makers.

The Board of Technology considers it an essential task to contribute to the development of methods for assessing technology, especially in connection with methods involving the citizens, users and employees – those affected by the technology in question. The Board applies different methods for assessing technology: Experts may conduct analyses which offer an overview of the issues. If experts are requested to make assessments, the Board of Technology normally makes certain to consult several experts with different approaches, possibly by establishing an interdisciplinary working group.

Citizens may formulate objectives, visions, requirements and needs. This can be facilitated by having participants criticize existing conditions and formulate visions and actions which could help solving problems. Or, a panel of citizens might question a panel of experts at a conference and prepare a final document presenting requirements and formulating objectives for the applications of a technology. Scenario workshops and consensus conferences are examples of such methods.

Technology assessment may also present information to the participants to give them an opportunity to debate an issue, thereby providing them with a background for making their own assessments. Thus, education of the general public could be considered a method of promoting the population's own opportunities for assessing technology.

5.3 Organisation of work at the Danish Board of Technology

5.3.1 Organisational structure

The DBT secretariat is the operational unit responsible for carrying out projects and informational activities. The Board of Governors is responsible for the strategic management and budgetary oversight, but the day to day management is in the hands of the Board's director in close cooperation with the Board's staff of Project Managers. The Board of Governors meets four to six times a year.

The secretariat is composed of the project management personnel, which takes responsibility for project execution; the information and public relation management personnel, which deals with media activity, organisation of events and publication; the project administration, supporting project execution; IT staffers, responsible for the internal ICT systems, and development of web tools and interactive features in project activities; the administrative and finance staff; and the director.

Apart from the Director, the secretariat employs 9 project managers (scientific staff), 5 ICT and administrative staff members and 5-10 project assistants – mostly students. The personnel span a wide range of expertise from biology, political science, geography, communication, political administration, anthropology and sociology.

Project work is mostly managed in-house and seldom through external contracting.

The secretariat most often makes use of an ad-hoc team structure for project execution. One project manager is the main responsible and other project managers, project secretaries and assistants take part in the planning and execution.

5.3.2 Priority setting

The priority setting process of the DBT Foundation is not set yet, but is supposed to be strongly inspired by the well-functioning process of the DBT, which is described below.

Each autumn an annual agenda (work plan) was developed that set out which projects would be initiated in the coming term. The agenda was formed in four phases:

1. All actors can give input to the agenda via the website of the DBT, and a brainstorm workshop is carried out with the Board of Representatives;
2. The secretariat ranks the input and provides a list to the Board of Governors, which then decide on a short list of topics;
3. The secretariat develop and presents each idea in a short research proposal;
4. The Board of Governors makes a final selection of projects to be initiated in the coming term and the DBT then further develops the selected project to full project designs.

The choice of topics to be dealt with by the Board of Technology was made by the Board of Governors on the basis of an open compilation of ideas through the website of the Board. Ideas may be suggested by the Board of Governors, the Board of Representatives, the secretariat, members of the Danish Parliament, the Government, authorities, researchers, organisations and private citizens. Among the 50–200 suggestions the Board received, 4–7 were selected for coming projects.

When the Board of Governors chose subjects they put emphasis on 6 criteria:

- Technology content – either in the problem or in the solution
- Is there a problem to be solved? The Board wants to contribute constructively to decision-making – not to be dealing with open scientific questions.
- Is it important? The topics have to be either of large economic importance, mean much for some people or be important for society as such.
- Is the timing right – either the topics should be of actual importance or the Board should be able to orchestrate the timing itself.
- Is there an addressee – a need-to-know? Besides such an addressee there may be a need for general dissemination or for focusing on specific target groups.
- Is it a job for the Board? Or are there other actors who would be more obvious as actors on the specific topic.

Projects were initiated by the Board of Governors on the basis of a project description embodying the adoption of the project background, concept, purpose, the method used, target groups and facilitation and dissemination, anticipated impact, project organisation, timetable and budget. When such project descriptions were provided for the Board to initiate the project, methods were specified which were appropriate for providing the needed outcomes. The Board, therefore, made use of a wide range of methods, each with specific characteristics in terms of outcomes (for example qualitative/quantitative; explorative/visionary...), involved actors (experts, stakeholders, citizens, politicians), timing, needed resources, etc.

The Danish Board of Technology typically initiated 8-12 projects a year, 4-5 of these arising from the work plan of the Board and the rest being externally financed.

It is supposed that the DBT Foundation will build on this process, but with the Board of Representatives in a more prominent role as those who take part in developing ideas, prioritise and engage themselves in the execution and/or financing of projects.

5.3.3 TA approaches

The DBT conducts assessments in technology fields such as biotechnology, health, energy, transportation, climate change, and information and communication technologies. The Board makes use of a very broad concept of technology, which includes any solution based upon a systematic or procedural approach. This means that technology is seen as hardware, software, “org-ware” and “law-ware” in their own respect or in combination. For example, the DBT has made parliamentary hearings on issues such as questionnaire based examinations in basic schools, or public job replacement strategies. However, the core work of the DBT has had technology as a prominent factor – either as a problem creator or as a problem solver.

The Danish Board of Technology conducts technology assessments with a view to generating debate among the target groups – these being politicians, industry, NGOs, experts, citizens, etc. – depending on the issue at stake. This also includes groups in society which do not necessarily already see the necessity of debating technology.

The Board is not charged with assessing the functionality of actual technologies. Focus must be on opportunities for and impacts on people, the environment and social conditions. The objective is to clarify dilemmas and conflicts. This does not always mean that technology assessments have to conclude in recommendations for a solution; technology assessments may provide knowledge, identify joint views, conflicts and options as a first step towards finding a solution.

The Board of Technology always draws on the best available expertise - in the widest sense - and often across professions and sectors. Expertise may be found among the traditional academia, but it may also be found among stakeholders, users, consumers, and lay people. This wide concept of expertise and interest ensures that many types of knowledge and different values are represented in the assessments.

According to Lars Klüver, TA is about dialogue, about understanding and giving people room to contribute. In taking up a TA study, the DBT takes care to critically reflect on the need for combining a proactive and reactive TA approach. Lars Klüver does not think that the conflict between reactive and constructive TA opponents is meaningful. A TA approach is selected according to the case's internal dynamics and the composition of players. "Take nanotechnology for example, we have a huge push on nanotechnology but there is not the same push on the cautiousness side of that technology. So in that case, we would typically go in and represent the cautious approach. Whereas in let's say the energy area where you have big uncertainties about which technologies we should use in the future. In that case we also take responsibility for the innovation perspective, for the discussion about which way we want to go in our innovation. So we can be technology pushing or we can be technology sceptic if that is needed. Once we had a chairman who at a certain point said that the DBT works in the field between underused and overused technology and I think this is not a bad way of expressing it."

5.3.4 Overview of projects

In the last three years the DBT has worked with numerous projects in many different fields, e.g. within healthcare, ICT, energy, transportation, innovation synthetic biology, waste management and many others. DBT has carried out the following projects in the last three years:

Studies (interdisciplinary scientific analyses)

- Test yourself – an overview of the supply of increasing numbers of self-test products (expert and stakeholder work group and political dialogue)
- E-voting – a choice for the future? Recommendations for implementing e-voting (expert and stakeholder workgroup and political dialogue)
- Obesity as a societal problem – an overview of political tasks related to the obesity problem (expert workgroup and political dialogue)
- A sustainable Danish transport system – scenarios and calculations on converting the transport system to renewable energy in 2050 (expert and stakeholder workgroup)
- Energy producing buildings and the engagements of citizens in energy supply and consumption (expert and stakeholder workgroup and citizens consultations)

- Hazardous substances harmful to our health – a study on high risk components and assessment of REACH (expert workgroup)
- Waste as a resource - long term planning and strategy in Denmark (expert and stakeholder group)
- Responsible Innovation – a Danish strategy (expert and stakeholder workgroup)
- Clean drinking water – challenges of the future (a citizens hearing in the Danish parliament)
- School and media – It-support for learning (expert panel)
- Synthetic biology for debate (co-work with The Danish Council of Ethics and expert workgroup)
- The Internet of Things – Internet spreading to more and smaller units with GPS, RFID etc. (workshop and public meetings)
- Technology in residential homes for elderly people – to involve the employees (cooperation with two Danish municipalities)

Participative projects (consultations aimed at gathering the views of citizens)

- Clean drinking water – challenges of the future (a Citizen Hearing in the Danish parliament)
- Citizen Summit in Kalundborg – on climate change adaption (Citizen Summit)
- Citizens Summit on Biodiversity – how to prevent the decreasing in biodiversity? (Citizen Summit)
- Citizens Summit on regional development in Northern Jutland (Citizen Summit)
- 5 Citizens Summits on the challenges of the health care system (Citizen Summit)

International projects

- DESSI – Decision Support on Security Investments, EU FP 7 (expert and stakeholder group)
- Technology Options in Urban Transport, STOA (panel of EU Parliament for Science and Technology Options Assessment) (interview meetings in Copenhagen, Karlsruhe and Budapest)
- Security of eGovernment Systems, STOA (panel of EU Parliament for Science and Technology Options Assessment) (case studies and conference)
- BaltCICA – Climate Change Adoption in the Baltic Sea Area, EU INTERREG (stakeholder and citizens consultations)
- ECO-efficient transport – scenarios for sustainable transport in EU, STOA (citizens consultations)
- SURPRISE – security technologies and privacy, EU FP7 (citizens consultations)
- EST Frame - societal impacts of emerging scientific and technological developments, EU FP7
- PACITA – Expanding the TA landscape in Europe, EU FP7 (wide range of methodologies)
- World Wide Views on Global warming – citizens summit in more than 20 countries
- World Wide Views on Biodiversity – citizens summit in more than 20 countries

Research and fact finding

Research and fact finding is in DBT project context mostly done by inter-disciplinary expert groups. The work of these expert groups typically includes using the research of the experts from their own domains in cross-disciplinary discussion and analysis in a concrete problem-oriented policy related context. This means that new and societal relevant light is put on facts and results from different fields of expertise with the purpose of developing new knowledge, facts and results in a specific policy relevant situation. In the end this leads to policy recommendations based on the best available expertise, research and newest facts relevant to the policy area.

From the last three years of projects there are some good examples of this. E.g. the project ‘Obesity as a societal problem’ developed context relevant policy recommendations based on the best available research,

scientific results and facts from research fields of obesity, prevention, nutrition, psychology, impact of exercise and others, combined practical knowledge from practitioners and policy-makers this resulted in research and fact based recommendations for better prevention of obesity in the future.

Another good example is the project about e-voting, where different aspects of e-voting was analysed based on research and facts about security, democratic aspects, economy etc. Again gathering scientific and practical expertise enlightened different relevant aspects of changing to e-voting and recommendations where developed based on this.

Generally DBT does not perform actual research but instead gathers research results and facts based on research from scientific partners included in the projects.

Stimulating public debate and participation

It is a very important for DBT to stimulate public debate. DBT focuses very much on dissemination of results from projects both while the project is underway and when results of a project are published. Almost all DBT projects include at least one public event designed to create debate with relevant stakeholders as well as public debate. These events are often political debates or conferences about the results of a DBT project and the events have the purpose of engaging the project's target groups in debates that are also public. The events are always open to public and covered by press. The very least a project will do in terms of public debate are a press conference related to the publication of a report.

When it comes to participation DBT is considered as a front-runner. Citizen participation has always been an important part of the DBT self-image, and participation plays a substantial role in the DBT methodological expertise. About half of DBT's projects include citizen participation and both nationally and internationally DBT undertake the role of pushing citizen participation and developing new methods of citizen participation. Generally DBT events are well visited with typically up to 200 attendees (for specific citizen participation events it is up to more than 500 people attending) and DBT projects very often find its way into the media being as well newspapers and internet news as radio and television.

The DBT website had an average of 35.000 visits a month in 2011 and more than 10.000 downloads of reports. DBT link from the website to a number of Youtube videos from debates and conferences arranged by DBT and these are in average seen more than 100 times. DBT also publish a monthly e-newsletter (TeknoNyt) with approximately 2.200 subscribers, a newsletter targeted at the parliament but public available and a quarterly magazine (Technology Debate) with approximately 3000 subscribers. DBT's most popular report (Open Source Software in the public sector) has been downloaded close to 500.000 times!

Influencing political decision making

Policy-making and the political level is an important target for every DBT project. Mostly politicians are the primary target group and even if they are not then at least they are considered as an important secondary target group. In other words all DBT projects have the purpose of influencing the political decision making. DBT projects are thought in a problem-oriented, societal context most often linking them directly to policy-making.

DBT was constructed as an advisory council for the parliament and that has formed they work modes of DBT and thereby the focus of projects. DBT will always consider bringing relevant knowledge into policy making as its most important purpose. Probably the most direct method DBT has for influencing political decision making is the Parliamentary Hearing. This is a one-day event where DBT sets up a panel of

politicians and a panel of experts in a discussion about a hot political issue. This often takes place in between two readings of a bill, and the debate at the Parliamentary Hearing is therefore direct input for formulating the draft or the final bill. The hearings are often requested directly by a parliamentary committee.

Besides that DBT has a direct link to parliament and can ask to present project results and policy recommendations at meetings in the parliamentary committees. This opportunity is used in most the DBT projects and thereby results are passed directly to the relevant politicians. There are numerous examples of DBT project results and recommendations being followed and implemented as policy making.

5.3.5 Reflection on criteria of success

High quality in the results and performing of projects are implicit success criteria for any DBT project. Any project to be criticised rightfully would be considered a failure. On the other hand controversy about results of DBT projects is not a problem as long as the quality and integrity is of high standard. A good example of this is the project 'Open Source Software', which estimated and concluded that open source software had potential of major savings by being implemented in the Danish public sector. These concluded where strongly criticized by some of the major business companies in the IT sector. But in this case that was almost to be considered as a quality stamp for the project. The results where robust and the critics glanced off. The project thereby fulfilled another important success criteria by creating sever public debate about the pros and cons of implementing open source software in the public sector.

Creating public debate is an important success criteria for DBT projects and this is easily measured in size of press coverage and the number of visits and downloads connected to specific projects.

Success criteria for DBT projects can be different things, but the link to policy making is the most important criteria. Almost all DBT projects has the purpose of giving input to policy making in a specific area and the project is a success when the results and recommendations of the project is taken into consideration at the relevant political level.

Other relevant criteria of success are in line with the TAMI model of impact of TA methodologies. Some projects are designed to create knowledge, others to affecting attitudes and so on. All in all TAMI points out 20 different roles for TA, which are ale connected to a different impact. Measuring the success of TA is therefore no simple task.

5.4 Connecting to politics - Case study of Future Energy Systems

5.4.1 DBT Project in 2004-2007: The Future Danish Energy System

In the early 2000 the frame conditions of the Danish energy sector changed due to liberalization, the international climate conventions and increased oil prices. The changes gave new challenges to the Danish energy sector.

Various actors in the energy sector expressed an interest in discussing new targets and how the Danish energy system could continue to develop under these new conditions. Some of the actors from the energy sector contacted the Danish Board of Technology to stress the need for dialogue between the politicians in the Danish Parliament and the energy sector about this situation. The actors very much underlined that companies had difficulties with long term planning because of the pressure on them to have earnings in a

short term perspective. Still all energy companies and researchers needed to know something about their frame conditions and expectations of the future to be able to investigate and develop.

5.4.2 Initialization of the project

The Danish Board of Technology has a role to play as advisor to the Parliament and the government in technological and societal matters and decided to take up this request from the energy sector and plan a project about the Danish energy system in the future – within the time perspective of 2025.

In 2004 the Danish Board of Technology invited 10 representatives from the major actors in the Danish energy sector to participate in an investigation of possible ways forward for the structure of the Danish energy system in 2025. They represented experts and stakeholders, researchers and NGO's and the authorities in the energy field and they were responsible for the project as a Steering Group committee.

The project was based on the method Future Panel. The Panel was composed of members from the Danish Parliament. The Future Panel operates as a short-term committee with about 20 participants, representing all political parties. The Future Panel was supported by the Steering Group committee of key experts from the energy sector and by different smaller working groups focusing on economics and energy modelling tools. The Danish Board of Technology served as secretary and method responsible for the project process.

5.4.3 Set up and scope of the project

The main aim was to involve the politicians in the Danish Parliament and the actors in the energy sector in a close dialogue to forward a debate about the future – and to do that on a solid ground of knowledge. Secondly the project wanted to give a concrete contribution to the political decision making process on a new national energy strategy and thirdly the aim was to make all the materials and results from the project available to a broader circle of institutions and persons – to feed a further debate and analysis on important but complicated matters in the energy field.

The project arranged 4 hearings in the Parliament. The hearings were open to public and were directed by politicians from The Future Panel. Experts from the energy field contributed to the hearings with knowledge, ideas and presentations. A solid hearing material and a short newsletter were produced after each hearing. The project included scenario building on the future energy system in Denmark. The scenarios describe different possible directions for the energy system. Two main quantitative targets for the scenarios were set up

- to reduce the use of oil in 2025 with 50% compared to the level of 2003
- to reduce the emissions of carbon dioxide in 2025 with 50% compared to the level of 1990

It was decided to focus on technology- based scenarios to obtain the objectives in the project. The scenarios described what kind of technological mix could be used to reach the main objectives for both production and consumption of energy.

At a seminar the politicians in the Future Panel asked for a scenario that followed the main objectives in the project - reducing the oil demand and the emissions of carbon dioxide with 50 % - by strengthen a certain mix of energy savings/conservations and higher energy efficiency, using more wind power, using electric- and hybrid vehicles and bio fuels.

There was a common wish from the involved politicians and the members of the Steering Group to work with well-balanced ideas that would be regarded as a realistic and still ambitious offer with an aim that could interest the main part of the energy sector.

The politicians very much asked for a concrete scenario, easy to understand and suitable for further investigations. A working group with people from 4 different institutions (research and consultants) with expertise in energy modelling were asked to cooperate on building a new modelling tool to calculate and describe an energy scenario to meet the two main objectives.

The result should be a new flexible, not complicated energy-modelling tool, easy to communicate to others and fit for further practical use. The working group succeeded in this task and the model was reviewed by other experts in this field to be sure of the calculations and the solidness and coherency in the scenario. The new energy modelling tool was called STREAM.²³ The project produced a final report of the energy scenario work.²⁴

5.4.4 Results and general assessment of impact

The project had set up a rather ambitious goal from the very start – and as a consequence of this a lot of possibilities were lined up for going into pitfalls. How can you keep the process on the right track and avoid that some of the many involved institutions and persons lose their interest in the common project lasting over 3 years? Confronted with this question the Steering Group strengthened a persistent will to have an open and broad dialogue. There has been room for discussions, disagreements and new turnings in the process and a will to chase common ground for an important challenge for the energy future. It was a key issue that the process involved both politicians in the field of energy and representatives from the many actors in the energy sector combined with serious work with objectives, options and calculations.

The concrete modelling work of a new energy planning tool – the development of STREAM – has been a keystone in the scenario building. The result gave great confidence in this tool and its usability. An important cause to that is the co-work between 4 experienced players in the field of energy planning and modelling tools. The modelling aspect of the project presents robust scenarios that have been thoroughly calculated and reviewed by several institutions.

The results of the process were broad political support to the project scenarios for the future Danish energy system – a support that includes all parties in the Parliament. The scenarios gave a concrete contribution to the parliamentary negotiations on a new energy strategy for Denmark in 2007.

The project arranged 5 workshops on 5 means for achieving the targets of the project scenario

- biogas
- wind power
- district heating
- energy savings
- electric vehicles

The recommendations from these workshops were directed to the Danish Parliament and a running political negotiation on the energy strategy in 2007.

²³ For more information go to <http://www.streammodel.org/>

²⁴ http://www.tekno.dk/pdf/projekter/STOA-Energy/p07_The_Future_Danish_Energy_System.pdf

The scenario work was also used as a fundament for a hearing response from the Danish committee of energy and the committee on European affairs to the so-called Green book from the European Commission on a possible European energy strategy.

The scenario work was a fundament for further scenario building for 2050 in the Danish ministry of Environment aiming at the international climate negotiations and gave an input to a Danish Climate Commission working in 2008-2010. The project also gave fundament to a European project on developing energy planning for the Baltic Sea area.

The STREAM model has been used for the project "Sustainable Energy Scenarios for the Baltic Sea Region", the STOA project "Future European Energy Systems" and the projects "Gas market study for Poland by 2035", "Scenarios for the Danish energy system in 2020 and 2050" and "Scenarios and analyses of policy measures for the Danish Commission on Climate Change Policy".

The project reached the main goals – to involve many Danish actors in the energy field in a common dialogue on the important challenges of the future, leaving impact on the policy process in the Danish Parliament in the energy field and its results fed into a row of new energy analysis and energy modelling works. The project left fingerprints on the energy planning by forming energy technology based scenarios, testing their robustness by a new energy modelling tool developed to the specific project but suitable for a lot of new scenario works in the energy field because of its open and cross going character.

5.5 Future challenges for the Danish Board of Technology

The DBT Foundation is met with one challenge, which presumably will dominate its life during the next decade: It has to prove that a TA institution can live solely on external funding. This will change many things including establishing a new form of customer relation to those actors, who formerly only were customers to the content.

Besides this fundamental challenge, the DBT sees a set of challenges for TA – mainly connected to developments in technology and the context of TA.

Internationalisation of nearly all aspects of technology development and regulation is a tendency that has been accelerating very strongly through the last decade. The Board sees it as a main challenge to find ways to make TA follow troop and be able to assess technology at all relevant policy levels. Some actions taken by the Danish Board of Technology, such as the World Wide Views on Global Warming and the coordination of PACITA, indicates the beginning of a future in which the Board will see internationalisation as a main challenge and a main field of activity. Increasing synergy between TA units across Europe and across the world is seen as a must for the future.

The new media reality is a challenge that needs to be confronted. Information sources become diffuse, journalism becomes more popular and less deep, the written media loses terrain, etc. TA needs to find its way in this new media world. TA is important, focuses on determining issues for society, has stories to tell and conclusions to discuss – so, the content is there to be communicated. The challenge is to redirect the communication efforts into new and more effective modes in the new media picture. It is a matter of strategy and of resources as well.

Lars Klüver: “We have talked about technology being more and more internationalised. But the responsibility for technology is also decentralised. So there is a movement upwards and downwards, which we have to follow. This doesn’t make our job smaller. It expands our TA mission, and we have to be strategic in terms of forming partnerships, alliances, external funding and using our public grants. So I see this institution as having a very good starting point because I think we have the needed methodology, and we have a good reputation generally in the Danish society. But we have to convince both internal and external stakeholders about this development. I think we have started on that, but it’s quite a challenge. “

The latest developments in Danish TA prove this point. But the changes in DBT’s institutional settings do not change the ambition of promoting TA on all levels from local to international in the future.

Chapter 6 Parliamentary TA in Flanders (Belgium)^{25,26}

Pierre Delvenne (Spiral, Université de Liège), Johan Evers (Instituut Samenleving & Technologie) and Benedikt Rosskamp (Spiral, Université de Liège).

6.1 The institutionalisation of the Flemish parliamentary TA institute

This section intends to show how the need for (parliamentary) Technology Assessment (TA) knowledge emerged in Flanders, how it was linked to political evolutions in science, technology and innovation policies over the last ten years and how the Flemish parliament came to its decision to close IST on December 31st 2012 at the latest.

The institutionalisation of viWTA/IST over the last decade cannot be understood without going into the efforts of its advocates and opponents, and into the state of the social debates with respect to science and new technologies in Flanders over the last decades

6.1.1 Political momentum for Technology Assessment in Flanders

Political advocacy for TA in Flanders during the 1980s and 1990s

The history of Technology Assessment in Flanders goes back to the 1980s when some political parties (social democrats and green politicians) wanted a supporting structure for science and technology (S&T) issues connected to society and policymaking. A first idea, inspired by the model of Committee P or Committee I²⁷ was rapidly abandoned with the ongoing regionalization of competences in the late 1980s in Belgium. By the end of the 1980s and the beginning of the 1990s, the first TA programs were introduced within enterprises and research institutes, but up to then the main focus for TA activities was to be located on the federal level.

In 1984, in line with its cultural emancipation project, Flanders started the campaign named 'Third Industrial Revolution in Flanders (DIRV – Derde Industriële Revolutie in Vlaanderen)'. This was the impulse for a regional innovation policy with a strong technology push focus, encouraging the implementation of new technologies. At that time, some questions and fears surfaced with regard to the consequences of the introduction of such technologies in the workplace and in society as a whole. Around that time, the Flemish Minister Norbert De Batselier (social democrat) wanted to introduce a TA function in the Flemish technology policy that would - at first - help to make rational, strategic choices in technological policy-

²⁵ On October 24 2011, the Flemish parliament decided to cease the operations of its parliamentary Technology Assessment organization, the Institute Society & Technology (IST) at the end of December 2012. This text was drafted mainly before that decision and all the interviews with 'insiders' and 'outsiders' were recorded before October 24, 2011, except for the interviews with Lieve Goorden and Johan Evers. It was decided not to redo the interviews or rewrite the text as a whole in the knowledge of the closure scenario of viWTA/IST. In the opening and concluding section, we (briefly) refer to the demise of VIWTA/IST and its process of de- and re-institutionalisation.

²⁶ In 2008, the organisation's name was changed from the Vlaams Instituut voor Wetenschappelijk en Technologisch Aspectenonderzoek (viWTA) into the Instituut Samenleving & Technologie (IST.) For consistency reasons, we will use 'viWTA /IST' to denominate the Flemish PTA institute.

²⁷ Committee P (Standing Police Monitoring Committee) and Committee I (Permanent Oversight Committee on the Intelligence and Security Services) are external and permanent review bodies of police and intelligence services respectively. They act as watchdogs by monitoring the working of the police and intelligence forces in Belgium and are responsible to the Federal Parliament and the Senate respectively.

making (with regard to environment, safety, sustainability, work-safety...) and secondly implement these policy considerations into research programs (5% of the research budgets was to be spent on TA), in order to connect technological research with societal considerations. Several (soft) TA missions were awarded to research institutes, such as the Flemish Institute for Technological Research (VITO), the Belgian Nuclear Research Center (SCK-CEN), the Flanders Institute for Biotechnology (VIB), and enterprises^{28,29}.

Along the lines of the DIRV action, during the second half of the eighties, four generic technological research programs were developed and implemented at the beginning of the nineties. They covered the areas of biotechnology, new materials, energy technology, and environmental technology. Each of the four technology programs was provided with a TA research section, covering the social effects of these technologies (in the energy technology program, the TA research was eventually dropped). Afterwards, it became apparent that such TA analyses had little influence on the actual development of new technologies, mostly because TA activities were separated from technological research (Goorden 2004: p. 8-14³⁰).

The Flemish Foundation for Technology Assessment (STV/StIA)³¹ acted as a founding father for TA in Flanders, because it brought together different TA-like knowledge sources that were created at both the enterprise and the sectorial levels. These reports can be compared to what was later called constructive TA, with the strong claim of embedding ethical, legal and social aspects in research. There was a rather important focus on social science research and the studies were designed to inform the Socio-economic council of Flanders (SERV) as well as the Flemish government. STV/StIA coordinated different TA programs within DIRV action programs. However, these TA programs were always limited in time, and thus lacked continuity. "Therefore, Paul Berckmans, director of STV/StIA, suggested to Minister Norbert De Batselier to establish a permanent TA institution", remembers Lieve Goorden, TA researcher at the university of Antwerp and a previous employee at STV/StIA.

"At some point, it became hard to draw the attention of the social partners to TA, as it was perceived as too far away from their daily preoccupations. The STV/StIA foundation then focused more on the ongoing and new activities in innovation that were not necessarily technological but encompassed a lot of aspects of corporate and sectorial work organisation", says Paul Berckmans. "It was a hard job to broaden the concept of innovation towards non-technological aspects of innovation (such as organisational innovation or innovations in human resources), but this is now what STV/StIA is working on. Looking back at it now, it was a good decision for STV/StIA to go for a different approach. Inside the SERV, it would have been impossible to implement the kind of work that viWTA/IST does. The fact that STV/StIA left TA to others was later accompanied with an important political change in Flanders³²".

After the efforts of Minister Norbert De Batselier, TA was labeled as 'social democrat' and did not constitute a priority in Minister-President Luc Van den Brande's agenda (Christian democratic party). In 1996 a

²⁸ TA was kind of a "buzzword" at that time. The problem was that Technology Assessment research was not clearly defined and significant social science research on (new) technologies was relabelled as being TA research.

²⁹ VITO – Vlaamse Instelling voor Technologisch Onderzoek; SCK-CEN - Studiecentrum voor Kernenergie; VIB – Vlaams Instituut voor Biotechnologie.

³⁰ Goorden L., Innovation Policy and Technology Assessment in Flanders, Study commissioned by the Flemish Institute for Science and Technology Assessment (viWTA), Final Report, 2004.

³¹ STV (*Stichting Technologie Vlaanderen*) was later renamed into the Foundation Innovation & Work (*StIA - Stichting Innovatie & Arbeid*). StIA is the research centre of and for the social partners in Flanders and is part of the Socio-economic council of Flanders (*Sociaal-Economische Raad van Vlaanderen - SERV*). The latter is an advisory organ to the Flemish Government.

³² Nevertheless, the SERV still has two delegations within the board of directors of viWTA/IST, one coming from STV/StIA.

proposal of the green party to establish a TA institute within the Parliament could not convince the coalition of Christian democrats and social democrats. Van den Brande feared that such an instrument might slow down the government's innovation priorities (Holemans, 2002³³). The situation changed after the elections of 1999, which resulted in a liberal-socialist-green coalition and made the Christian democrats end up in opposition after having been 50 years in power.

Social debates on science, technology, and innovation

In the meantime, other societal evolutions in Flanders opened the path for the institutionalisation of parliamentary TA in Flanders and the missions it could fulfil. In the second half of the 1990s, the public's attitude towards S&T developments and especially their secondary effects had changed negatively. Some political criticism emerged regarding the VIB's (Flanders Institute for Biotechnology) internal TA mission. Equally, the way public authorities were dealing with the Genetically Modified Organisms (GMO) topic, when the public began to debate it, was also criticized. Being puzzled about how the debates on biotechnology should be organized, the main actors and stakeholders predominantly mentioned parliamentary TA institutes (PTA) as independent structures that could take up a constructive role for elucidating such debates in Flanders. In the same period, the dioxin crisis also revealed a crisis of scientific expertise. In parliamentary hearings, MPs perceived that no independent experts could be heard on dioxin. The claim for an independently organized social debate on science, technology and innovation and an independent advisory body on technologies fed the momentum for creating a PTA institute.

Preparatory activities in the Flemish Parliament in 1999 and 2000

In preparation of the institutional framework of the PTA organisation in Flanders, the Flemish Parliament planned a series of parliamentary hearings, discussions and conferences³⁴. In addition, some parliamentarians went on an official visit to the Dutch Rathenau Instituut.

Finally, it was the well-informed TA-researcher and Flemish MP for the green political party (1999-2004) Dirk Holemans who contributed considerably to the actual decree on the Parliamentary TA institute. This decree was voted unanimously. The European Parliamentary TA network (EPTA network) also favoured the establishment of a PTA institute in Flanders at that time.

6.1.2 2001-2011: ongoing institutionalisation of the Flemish parliamentary TA institute

The "Vlaams Instituut voor Wetenschappelijk en Technologisch Aspectenonderzoek" (viWTA – Flemish Institute for Science and Technology Assessment) was founded by decree by the Flemish Parliament on July 17, 2000, as an independent and autonomous organisation working for the Flemish Parliament. It became one of the paraparliamentary institutions with their own legal personality (besides the Ombuds services, the Children's Rights' Commissariat and the Peace Institute, which was founded in 2004). Being physically located within the Parliament's building, the institute can also rely on the administrative, financial and personnel services provided by the Parliament.

³³ Holemans, D. "The Long Awaited birth of a Flemish TA-institute" in: TA-Datenbank-Nachrichten, Karlsruhe, Institut für Technikfolgenabschätzung und Systemanalyse, 3 (10), 2001, p. 61-65. Also available via <http://www.itas.fzk.de/deu/tadn/tadn013/hole01a.htm>

³⁴ The Royal Academies for Science and the Arts of Belgium have organized a conference on TA. Robby Berloznik (the first and current director of the viWTA/IST and at that time representative of the federal scientific administration [BELSPO] in the EPTA network), as well as Lieve Goorden were heard during the Parliamentary hearings. They also gave keynote presentations during the TA conference.

Its parliamentary TA mission is based on three elements: the institute first has to investigate the different ethical, legal, and social aspects and impacts of S&T developments that are relevant for the decision-making process. Related to this, it has to initiate a constructive debate with relevant stakeholders and possibly with the general public³⁵. Finally, these two elements have to provide information and attitudes that are translated into knowledge and recommendations for parliamentarian's use. As such, viWTA/IST tries to contribute to an increasingly knowledge-based policymaking on science and technology issues.

In 2002, the institute organized a pilot project on the issue of Genetically Modified food. This project successfully combined a public participation exercise (the very first consensus conference in Belgium) with a successful political follow-up under the form of a parliamentary resolution largely based upon the results of the consensus conference.

Evaluation and organisational changes

The major shift happened after 5 working years, when the decree required an evaluation of the institute. It was carried out by a team of 3 independent academics, each of them having extensive expertise in evaluation, technological and science policy matters.

First, the experts came to an overall positive assessment. viWTA/IST was estimated to be at its rightful place and to fulfil a unique mission. Furthermore, the institute appeared to play a constructive part in the innovation system and to produce high quality work. On top of that, a number of recommendations were expressed. In 2008, the official regulation of the Parliament with respect to viWTA/IST, and the internal regulation of viWTA/IST were adapted according to the conclusions of this evaluation.

- Firstly, the institute should make its procedure with regard to the selection of themes and projects more transparent and open towards national and international partners, stakeholders and innovation actors. Corporate governance actions were also taken to better distinguish strategic and operational management.
- Secondly, the relationship to Parliament was to be strengthened. To this end, an additional, more simple and direct way for engaging the institute was allowed so that short ad hoc responses could be delivered to the demands of parliamentary committees.
- Thirdly, the institute was also consequently renamed into Instituut Samenleving en Technologie (IST - Institute Society & Technology) to emphasize the bridging function between technology and society.

Closure scenario of viWTA/IST in 2012

Important remark

We refer here to the parliament's decision of October 24 2011. In the months following this date, there have been several talks between viWTA/IST, the Flemish Parliament, the Flemish Government and different organisations that could take over (some) TA research and advise activities of viWTA/IST. The outcomes of these talks are more explained in the Chapter 5 (Future challenges for policy supporting TA in Flanders).

³⁵ Integrating stakeholders and the general public through participatory methods within such an organisation was a real challenge and innovative for the Belgian policy culture - strongly influenced by consociationalism and neocorporatism. In Belgium, the organized civil society is strongly embedded in the political system. Most consultations are carried out at an intermediary between citizens and the state. On the one hand, ideological "pillars" have structured the Belgian pluralist society for a long time. Compromises are negotiated by elites of the pillars, which then make them accept by their basis. On the other hand, social partners - representatives of both employers and labour unions - negotiate working conditions, wages, at sectorial levels. This model "gives few incentives for debates at the level of the citizen" (Holemans 2002).

The decision on the demise of viWTA/IST has been prepared by a political working group, which was installed in November 2010 by the Bureau of the Flemish parliament in order to have an political evaluation of 3 out of 4 paraparliamentary institutes (the Flemish Peace Institute, the Children's' Rights Commissariat and viWTA/IST). In other words, this working group discussed on what could be the future of these institutes within the context of the Parliament. Representatives from all democratic political parties present in the Flemish parliament took part in this working group. In May 2011, the representative from the green party (Groen) decided to leave the discussions after a mediatised conflict on the objectives of this working group. The representative argued that the working group had too many prejudices and jumped too fast to closure conclusions for the different organisations.

Almost a year later - on October 24 2011 - the Bureau of the Flemish parliament approved the conclusions of the working group. Concerning viWTA/IST, the parliament decided that it will cease to exist on December 31 2012. Concerning its activities, the decision differentiates between TA advice function and TA research function of viWTA/IST:

- Its TA *advice* function will be delegated to a committee that consists of parliamentarians and scientists. Reference is made here to the current Catalan PTA model, where the president of the parliament is also chairman of this committee.
- Its TA *research* function will disappear. The Flemish parliament does not see itself as having to play a direct role in financing research at universities or other research organisations. It based its decision on the premise that a parliament cannot finance research: what can be done better elsewhere, should be done there.

The parliament's decision leaves an opportunity for the Flemish government to take up the TA research and/or TA functions of viWTA/IST.

Related to the writing of this document, it is important to mention that -except for the talks with Lieve Goorden (academic TA researcher) and Johan Evers (senior project manager viWTA/IST) - the interviews were conducted before the October 24 2011 decision. All interviewees were, however, aware of the fact that a parliamentary working group was considering the future of the paraparliamentary institutes and that there were uncertainties regarding viWTA/IST's future. Some interviewees position the activities of the parliamentary working group against the global state of financial fear and tumult of the last years. The last regional elections in Flanders (in June 2009) lead up to a distinct political shift to the right. Consequently, budgetary restrictions were put on the political agenda. Moreover, the institute's position has always been somehow vulnerable as it was considered by some politicians as an institution marked by the political colour of its main advocates (social democrats and greens) that have become less influent over the last decade. However, it should be noted that the decision to give up viWTA/IST was approved by all political parties, except for the green party. After all, the representative of the green party – as stated above – had left the working group in May 2011.

The parliament's decision on the demise of viWTA/IST by the end of 2012 marked a period of uncertainty, not only for the personnel of this organisation but also about the future of participatory and decision supporting TA in Flanders. It sharply indicates that the process of (re)institutionalisation of TA in Flanders is nowadays more than ever of topical interest.

6.2 Institutional context of viWTA/IST

The aim of this section is to describe the social network that surrounds viWTA/IST, in terms of stakeholders and competing or supporting TA activities from other actors. Furthermore, this section clarifies the niche the institution occupies or the added value it offers, and gives some insight in how viWTA/IST optimizes its role in the Flemish Parliament.

6.2.1 Relationship with the Flemish Parliament and other stakeholders

Organisational level

By default, the institute works for all parliamentarians and political parties. All political parties are represented in the viWTA/IST's Board, according to their respective political power. Furthermore, half of the Board consists of individuals from research institutes or advisory councils that have been appointed by these organisations. The board thus relies on a double equilibrium: the majority/opposition balance and a second balance between political and scientific representatives.

The first circle of addressees of the knowledge produced by viWTA/IST clearly encompasses the MPs and the parliamentary committees. The MPs sitting in the board are volunteering for this position and they can act as important intermediates for their party or the parliamentary committee they sit on. Depending on the topics addressed and their focus, single projects raise the attention of political parties that are traditionally sensitive to such topics (the environment triggers the attention from the green party, welfare matters get the attention of the Christian democrats, ...). Personal contact with MPs is very important for the Scientific Secretariat. It sometimes takes up a proactive role towards parliamentarians that submitted questions related to S&T. The fact that the institute is physically located inside the Parliament is a great asset for this kind of contacts.

There are several ways how the institute interacts with (members of) the Parliament.

- During the set-up of the annual working program, an initial trend study is submitted to the relevant parliamentary committees and other innovation stakeholders, in order to get their feedback on how to meet their needs and expectations. The draft program is also discussed through in-depth exchanges during EPTA meetings. Finally the program has to be endorsed by the board of directors.
- The Bureau of the parliament and parliamentary committees can ask the institute to conduct research into S&T issues having a societal impact. In addition, as mentioned above, a simplified procedure also introduced the possibility for short ad hoc missions (state of the art in technological development, literature reviews, reports, advices, ...). A study on cyber bullying, a study on road pricing and an advice on the Flemish Innovation policy (Vlaanderen in Actie) are some examples of assignments from the Flemish Parliament over the past years.
- Every project or study is always translated into a document tailored to the MP's needs. That document can take the form of a dossier, which is shorter and develops the policy implications of a technology within the framework of the Flemish policy competences. Alternatively, some projects also lead to policy recommendations. However, these recommendations emphasize on "what *can* be done, rather than on what *should* be done".
- The institute has the quite unique opportunity to send (proactively) a letter to the chairman of a relevant parliamentary committee and ask to be heard to present the results of a study. The director along with the responsible project manager and/or someone from the executing project research consortium then briefly present the scientific findings before going into the details regarding the policy recommendations. The parliamentary committee is not obliged to react upon reports. Such a

hearing can only take place in committees (never in plenary), but the possibility exists for joined committees meetings to be organized.

- The institute also proactively sends information (newsletter) or offers its services to the Parliament or its committees when issues regarding S&T developments surface in debates or questions.

There is no formal relation between viWTA/IST and the Government and between the institute and the other Parliaments in Belgium. According to the decree, only the annual report is officially sent to the Flemish Government by the Parliament after its approval.

The institute also addresses a second circle of stakeholders, as well as the general public. Since half of the board of directors is composed of representatives of research institutes or advisory councils (socio-economic, agriculture & environment, health and science policy), these persons play a crucial role in disseminating the project results in their respective communities (social partners for instance). Besides, the institute is clearly one of the few institutes directly working with lay people and the general public rather than solely with the organized civil society.

According to some interviewees, the gap between viWTA/IST and the S&T community is more significant than between viWTA/IST and politics and between viWTA/IST and the general public. This is especially true as far as the industry and the research centres are concerned, with an exception for universities that are still regularly involved with viWTA/IST on a project basis. While some interviewees state that viWTA/IST has never been in close contact with industry and laboratory groups of research centres because this is not the role of parliamentary TA, others emphasize that these environments are valuable concerning concrete technological products and developments. Furthermore, industry has other sources of information and invests in other channels in order to influence the decision-making process. The interaction of viWTA/IST with the S&T community is mostly project-based: viWTA/IST contracts experts to do the research, it contacts experts for providing advice and review of project results and it consults experts in its participatory events. Furthermore viWTA/IST disseminates its project results in the expert network that has been built up during the project and it invites experts during the valorization events related to a project. There is no systematic screening of citation of viWTA/IST results/activities in academic publications.

Unanimously, all the interviewees (both ‘insiders’ and ‘outsiders’ of viWTA/IST) described the institution as ‘an advisory body for parliamentary decision makers, based on scientific research and with the involvement of the general public. The advisory function is predominant as it constitutes a crucial evaluation criterion for initiating and finalizing projects by viWTA/IST Board. The unique added value of viWTA/IST’s work is to operationalize the combination of S&T, policy advice and involving general public.

Project level

viWTA/IST subcontracts the larger parts of its TA research activities. So it has built a strong networking capacity with research actors. In certain projects (e.g. a technology festival, as our illustrative case study shows), the institute sets up advisory committees with external people/stakeholders. For single events, the institute may have associated with civil society organisations to have a greater impact on the policymaking and/or public agenda and reach more people. Among other goals, it pursues a strategic networking objective by involving the broadest circles and the most relevant people in the TA process.

When the institute collaborates with other organisations, for example when subcontracting some parts of a study, these collaborations are based on a contractual basis that defines responsibility and duties in a top-down relationship, to ensure no tensions or conflicts of interest will occur. Questions from lobbyists concerning entry in the parliamentary activities or other lobbying requests are rare and consistently declined.

The personal contacts with the contracted researchers also link up the institute with other research institutes, such as the Flemish Institute for Biotechnology (VIB), the Research Centre on Micro- and Nanoelectronics (IMEC), and the Flemish Institute for Technological Research (VITO), the Belgian health care knowledge center (KCE – Kenniscentrum voor de Gezondheidszorg), the King Baudouin Foundation, etc.

6.2.2 Relationship with other TA and TA-like activities

The Technology Assessment landscape in Flanders is pretty limited, especially in its relation to politics. There is some research practice in the fields of sustainability, innovation and Science and Technology Studies (STS) but this is limited to small academic research units. Frequently, viWTA/IST has to contract research consortia to bring together enough expertise in the investigated domains. These outsourcing efforts sometimes gave birth to new centres of expertise (e.g. in participatory action research at the university of Antwerp).

Nevertheless, TA in Flanders was not built from scratch with the creation of viWTA/IST. Rather, it has been the result of an evolving process. Above we have shed light on the role played by STV in assembling TA-like projects, on the influence of EPTA through the Belgian representation of BELSPO (federal research administration) and on the important part played by single TA researchers. With the regionalization of most STI competences, the most relevant location to establish a PTA institute seemed to be at the regional level. However, certain matters such as Health Technology Assessment, Nuclear Energy research, Energy, Space research are still dealt with on a federal level and therefore do not constitute a focus for viWTA/IST. The social debate TA model (relying on the social partners) giving advice to the government has been complemented with an institute working with the society at large and that targets its work towards the Parliament. Innovation somehow got split up into social innovation and innovation at the workplace which was left to STV/SERV and technological innovation, which was taken up by viWTA/IST.

The viWTA/IST team is actively involved in networking activities at the national and international levels (Belgian STS network, ETAG consortium, EU-funded projects like PACITA). The EPTA network gives the institute a good international linkage and is a powerful mutual-learning instrument. However, as stated in some interviews, it bears the risk of isolation of TA practitioners among themselves. The bond between viWTA/IST and the Rathenau Instituut is considered as strong. This is due to the common language, common methodologies and to historical reasons, i.e. the trip of Flemish MPs to the Rathenau Instituut about 10 years ago, during the founding process of viWTA/IST.

6.2.3 Reflection on the institution's niche

The added value of the viWTA/IST is that it is working with the entire society and that it “breaks down the walls in the discussion dynamics” (Paul Berckmans) between science and innovation actors, lay people and politicians. For instance, a survey on the attitudes of the MPs towards science and technology pointed out to what extent their discussions are primarily guided by ideological motives and to what extent they need to be confronted with scientific information and everyday people’s concerns. Even though MPs can get a lot of information from institutes, think tanks and the Flemish Council for Science and Innovation, advisory bodies, etc., none of these institutions provides any information that is based on the participation of the S&T community, the general public and the politicians, or at least the way viWTA/IST does so. viWTA/IST benefits from a unique position in the Flemish landscape. By involving the general public or lay people, it looks beyond the traditionally consulted social partners or organized civil society.

The institute also has a quasi-monopoly over the use of participatory methods for assessing the societal impact of STI in Flanders. The advantage of involving lay people is that “they ask the right questions, even while they often cannot formulate the answers” (Paul Berckmans). viWTA/IST ensures the communication between the state of the art in technology development on the one hand and the inventory of questions and public issues related to it on the other hand. The “stories behind the numbers” (Bart Van Malderen) that the policymakers get from no other debating, research or advisory institution constitute another original and exclusive aspect of the information provided by viWTA/IST. It is often easy to have statistics (on infertility for instance) but what viWTA/IST provides in addition is the opinion of people behind particular issues (stress, difficulties, social pressure, ...). These aspects only come to the surface when individuals are invited to participate.

If resolutions are based on the work of viWTA/IST, they also refer to it as such³⁶. If the Government takes up recommendations or other study results, it does not necessarily make a clear reference to viWTA/IST. This makes it difficult to measure the direct impact of viWTA/IST. In spite of serious efforts to make policy recommendations and the ever increasing closeness to the Parliament, most projects outcomes do not lead up to parliamentary resolutions. Behind the scene and other internal discussions amongst MPs based on viWTA/IST study results are not easy to detect. Other success criteria will be discussed in Section 6.3.5.

6.3 Organisation of work at viWTA/IST

This section is about implementing the institutional mandate. It clarifies why the institution works the way it does and describes the dynamics along which a broad range of possible and actual, specific TA projects come to life, live for a few months or years, have a certain impact, and eventually disappear or evolve into new themes and projects.

6.3.1 Organisational structure

The Institute is made up of its Board of Directors and a Scientific Secretariat. The Board of Directors is composed of 8 Flemish representatives of all political parties and 8 experts from the Flemish scientific, technological, environmental and socio-economic scenes. The Chairman of the Board of Directors is elected from within the group of 8 Flemish representatives. The Scientific Secretariat carries out the day-to-day work. It is led by one director who manages a scientific team of 4 senior and 1 junior project managers, in addition to an administrative team composed of 1 secretary and 1 communication and coordination officer. 6 people work on a full-time basis and two people work 4 days a week.

The organisational chart of the institution is quite horizontal and there are no departments at all, only people with different responsibilities.

The director, Robby Berloznik, graduated in political science and is specialized in science and technology policy. Before the creation of viWTA/IST, he was responsible of the socio-political aspects of a TA mission at the Flemish Institute for Technological Research (VITO).

³⁶ 17 out of the 62 viWTA/IST projects have resulted in policy recommendations to the Flemish Parliament. 6 parliamentary resolutions are explicitly based on viWTA/IST recommendations: Genetically Modified Food in 2003, Youth and Gaming in 2008, Nanotechnology in 2008, Non-ionizing Radiation in 2009 and Fertility in 2011.

The project managers often combine a natural/life science education with a specific specialization in social or political sciences, ethics, journalism or other humanities. Most of them already had a certain experience in academic TA projects and/or in research or advisory bodies related to energy and environment matters.

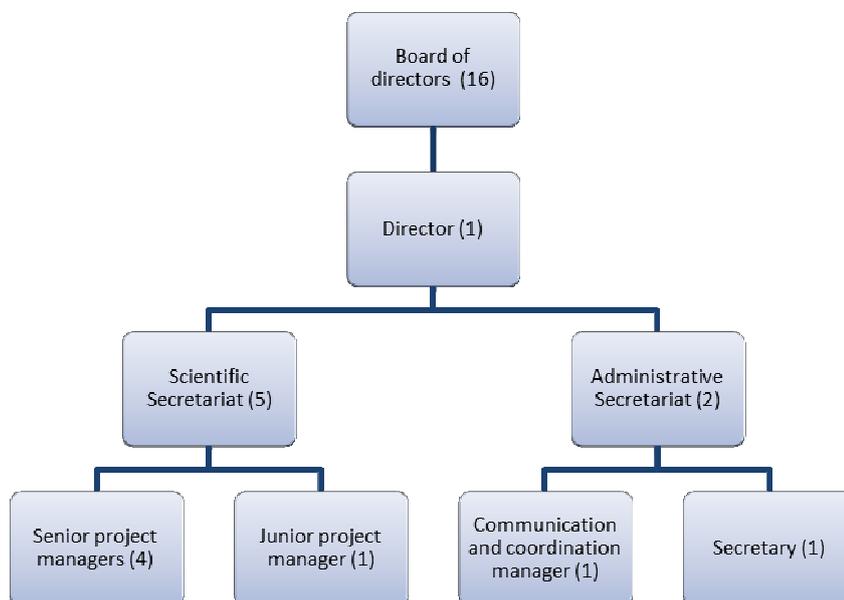


Figure 6.1 Organisational chart for IST

The Scientific Secretariat is responsible for the day-to-day activities and coordinates the research and supervises the public participation. viWTA/IST can use ad hoc committees of experts. More important and time-consuming projects³⁷ are actually outsourced to national or international research consortia through public calls for tenders because the institute’s financial and human resources are too limited to endorse that on its own. The scientific secretariat thus specializes in the design and launching phase of the projects and it also supervises the projects, ensuring their quality and the pursuit of objectives all along the process. The translation activity between the scientific report and the “viWTA/IST dossier³⁸” for the parliament is also outsourced to a specialized science journalist or science writer. During major participation initiatives (such as a technology festival, round-table discussions and consensus conferences), external facilitators also come in.

6.3.2 Financing

The viWTA/IST Board decides on the annual budget of the institute, the multiannual financial framework and the number of Full-Time Equivalents (FTEs), which determine the volume of staff. All have to be approved by the plenary session of the Parliament. For a long time, the annual budget amounted up to about 1,5 million euro but it decreased over the last few years to 1,3 million euro. So far, parallel funding (ETAG funds, third parties funding) was rather minimal (3-4% of viWTA/IST’s budget). It has a special line for

³⁷ The vast majority of the research is outsourced to academic experts, research consortia or consultants. In rare cases, a project manager from viWTA/IST performs the research and report/dossier writing.

³⁸ A dossier is a 35 to 65 page document that focuses on concise and comprehensive information to non-experts, in particular MPs and interested citizens, about the technological, societal and policy issues at stake. Between 2001 and 2011, viWTA/IST has published 23 dossiers.

European funding (CIVISTI and PACITA projects³⁹), but since these funds are limited in time and thus subject to strong variations, the institute does not rely on them and only participates in European projects if a win-win situation can be realized.

The financial dependence on the parliament makes the institute intrinsically vulnerable and subject to political critique, political rationalities and the continuous risk of budget cuts. This risk for budget cuts or even ‘sudden death’ hampered viWTA/IST from taking a more proactive (even provocative) role in S&T debates. viWTA/IST has therefore always opted for a traditional communication toolkit: rather than developing and using opinion articles, TV interviews or social media activities, it focused on distributing reports, dossiers, policy recommendations and maintaining a website that makes all publications and information on relevant activities available. According to Peter Raeymaekers, the chosen communication strategy of IST relates to the “limited debating culture in Flanders” and is an obstacle for viWTA/IST to take up a more proactive and even thought-provoking or controversial attitude. Although a stronger “advocacy” attitude could be perceived as conflicting with the impartial, neutral and objective initial mission of viWTA/IST, this outreach aspect requires further attention in the future.

6.3.3 Priority setting

The role of viWTA/IST in S&T-related debates is double and has different temporalities. On the one hand, the institute has a proactive role to pick up weak signals of what is going on in society, with regard to S&T (notably through trend studies), where S&T provide input and trigger discussions. On the other hand, it has to be responsive to current parliamentary discussions and interests and to be able to provide useful, timely, neutral, scientific information, advice and recommendations. In the end it has been mainly through the second aspect that viWTA/IST had to prove its usefulness to its first and most important target groups: the MPs and the parliamentary committees.

Since the viWTA/IST evaluation, the annual working program is based on a trend study that makes an inventory of technological state of the art developments and foresights. It is based on own monitoring activities but also fed with the input from trend databases (e.g. ZPunkt) and interviews with trend watchers, marketers, futurologists and foresight experts. This trend analysis is periodically updated.

In a next phase, colleagues in the first place (e.g. from the EPTA network) review that trend study. After that, several stakeholders are invited to give their opinion and to indicate where they see priorities and focus for TA work in Flanders. Then the relevant Parliamentary committees are consulted (innovation, education, environment, welfare). Those committees generally tend to broaden the scope and ask for more concrete studies, adapted to their needs and expectations. In the last phase, all that input comes together in the final working program. That working program consists of a series of projects and related communication plans and is submitted to the board for approval, every year in December.

The Chairman of the viWTA/IST Board is involved in two types of activities: first, the set-up and approval of the yearly working program after it has been discussed within the board of directors. Secondly, given the increase of demands coming from Parliamentary committees and ad hoc committees, along with the Director, he tries to integrate the suggestions, recommendations, and reports from the Institute in the debates that take place inside the Parliament or in its committees.

The public relations and ad hoc tasks take a lot of resources and the latter affect the nature of the classical TA work. Even though such tasks favour the contact with MPs and are quite successful, quantitatively, they

³⁹ Citizen Visions on Science, Technology and Innovation (CIVISTI 2009-2011) and Parliaments and Civil Society in Technology Assessment (PACITA 2011-2015)

also drag away time and energy from its core TA mission, because they overemphasize the short-term parliamentary service function of viWTA/IST.

The institute sometimes struggles to make its way to the current debates, which reveals a deeper gap in temporality between the short-term political discussions in Parliament and the long-term projects and prospective trend watches the institute undertakes.

6.3.4 TA approaches

IST successfully combines TA as a process and TA as a product (Delvenne, 2011⁴⁰, based on Van Eijndhoven, 1997⁴¹). It is able to successfully integrate different kinds of public in participatory exercises. But it also produces reports with scientific quality in a format that is designed to contribute to parliamentary decision making.

In general, viWTA/IST tends to use scientific consultation and participatory methods rather than exclusively scientific expert advice. The deployed participatory methods are neither an end nor a starting point of a project. The technological or societal topic always comes first. A project can either be an ELSA (Ethical, legal and Social Aspects) study on emerging technologies or start with some particular societal issue and see whether specific technologies interfere with it.

Usually, a brief project form ('projectfiche') is first discussed with the board and is evaluated according to the match between the methodology and the aim of the project. The methodology is then fine-tuned during the call for tenders phase where the contractors bring in their own expertise in the technical description. In the end the best-suited project is selected.

Every project needs to have a specific press and communication strategy spread over the process steps and tailored to the different target groups. In the final phases of the project a science writer usually makes the dossier, while the responsible project manager from viWTA/IST formulates the policy recommendations. The dossiers are physically sent out by printed mail to the Parliament and the annual report is sent to the Government, through the Bureau of the Parliament. Additionally, there are the traditional channels of communication: website, newsletter, e-mail.

Which stakeholders are involved, depends on the nature of the project, its focus and on the state of knowledge and advancement of some relevant technologies. The used methods are always tailored to address the relevant stakeholders, target groups and participants in the best possible way. On synthetic biology, for instance, there is little public or political debate in Flanders at the moment and it is expected that this will stay like this in the coming period (after 2011). So viWTA/IST's 2011-2012 project on synthetic biology focuses on drawing policy makers' attention to synthetic biology. The involvement of experts (using interviews or expert focus groups) is therefore seen as indispensable actors for information gathering and data collection. A valorisation activity is organized with focus on experts and policymakers, as it was assessed to be too early to organize broader public activities, involving lay citizens in a general debate on synthetic biology. Public dialogue events make probably more sense in coming years when there are more concrete technological realizations, policy initiatives and more media coverage. Another important factor for deciding on who to involve or to frame as target group in a project is the aim of the project. In order to put nanotechnologies on the public agenda, for example, one needs to lower the threshold for lay people to

⁴⁰ Delvenne P., Science, technologie et innovation sur le chemin de la réflexivité. Enjeux et dynamiques du Technology Assessment parlementaire, Academia L'Harmattan, collection Thélème, n°7, Louvain-La-Neuve, 2011, 359 p.

⁴¹ Van Eijndhoven J., "Technology Assessment : Product or Process?", Technological Forecasting and Social Change, 54-2, 1997.

attend a nanotech event and thus organize interactive public events. Whereas experts are more used to debate pros and cons of new technologies in a structured way, lay people are more inclined to start from their living experience. With the help of a good facilitator they come to think of how technology can contribute to resolve a certain issue. For some smaller assignments, desk research could do fine.

The wide (non-exhaustive) range of methods used by the institute includes:

- Citizens' consultations
- Focus groups with experts, citizens and/or CSO
- Technology festivals
- Round-table discussions
- Stakeholders workshops
- Panel debates
- Scientific reports by academics⁴²
- Information brochures by science journalists
- Explorative survey studies
- Interviews with experts and stakeholders,
- Retrospective trend analyses
- Consensus/citizens' conferences
- Public forums
- Parliamentary hearings

6.3.5 Overview of projects and output

The insider and outsider interviewees generally see viWTA/IST as an advisory body, which bases its recommendations on scientific research, including participation of the general public. That means that the participation can either contribute to gathering the data needed for assessing technologies, but can also be a goal in itself, when the aim of the project is to draw attention and raise awareness to some topics (like for technology festivals). As it gives insights in the topics at stake, the institute triggers and organizes debates and can sometimes even contribute to some change in the public opinion (cf. the more balanced debate that took place on the societal effects of gaming after a viWTA/IST study had been conducted in 2008). In the end, it is still the link to the parliamentary work that prevails. Every year, around 8 to 10 projects are carried out. However some of them cover more than a year.

Research and fact finding

The institute is not very involved in an academic publication strategy. However, viWTA/IST has actively been involved in editing or co-authoring books or book chapters, most of the time being based on its participation in European projects. For example: Slocum N., *Participatory Methods Toolkit*, United Nations University, Comparative Regional Integration Studies, 2003; Decker M. and Ladikas M., *Bridges between Science, Society and Policy*, Verlag Berlin Heidelberg, Springer, 2004.

⁴² A viWTA/IST scientific report contains a synthesis and analysis of scientific research results on the topic at stake. The report is peer reviewed by one or more external reviewers. viWTA/IST never submits this report or part of it for academic publication. In case the report is produced by academic researchers, they can continue working on the report or some parts for further publication. viWTA/IST requests that the author(s) acknowledge(s) that viWTA/IST commissioned the original research.

Domains in which viWTA/IST has undertaken TA studies include (but are not limited to):

- Information and communication technologies (gaming, digital divide, ...)
- Health issues related to society and technology (fertility technologies, ageing society)
- Energy technologies and climate change
- Life sciences (biotechnologies, synthetic biology, brain sciences and cognitive technologies, ...)
- Converging technologies (NBIC – nano, bio, info, cogno)

Stimulating public debate and participation

As described in the mission statement, the institute is mandated to contribute to the public debate. By using participatory methods, it organizes and stimulates the debate on issues related to (emerging) technologies, feeds it with scientific facts, and thus contributes to opinion forming with the public and the politicians.

For every project, the scientific secretariat sets up an advisory or ‘accompanying committee’ (composed of a maximum of 12 people from public administrations, academia, scientists and stakeholders). These members are involved on an individual basis and do not officially represent their organisation. However, they can act as strategic networking partners and they also give non-binding advice to the organisation committee (formed by the scientific secretariat and a member of the board).

Infotainment activities like technology festivals target an even more important number of people than participatory processes, such as citizens’ conferences. They associate different aspects of participation, knowledge-oriented activities and socio-cultural events. Their first objective is to raise awareness on social aspects of technology development as well as putting new topics on the public or political agenda. By doing this, viWTA/IST contributes to the public understanding of science and at the same time brings the citizens closer to its representatives and to the decision-making processes.

Influencing political decision making

In the final phase of a project there is often a valorisation and dissemination event to which relevant politicians and sometimes stakeholders and even the public are invited, for example the award ceremonies of the e-Dinges technology festival (see our illustrative case study). As mentioned above, viWTA/IST can also send a letter to the secretary and the chairman of a relevant parliamentary committee and ask to be heard about the results of a study. The Director along with the responsible project manager and someone from the executing research groups then briefly present the scientific findings before going into the details regarding the policy recommendations. This translation exercise from a scientific format to a format including policy options and recommendations constitute a particular added value of the work the institute provides.

The contribution to parliamentary debates and questions to the Ministers (e.g. a question submitted to a Minister on non-ionizing radiation, explicitly referring to viWTA/IST’s work) certainly belong to the more quantifiable and visible results that stick to the classic PTA mission of informing the Parliament. Sometimes they even take the form of a resolution (for instance the resolution in 2009 on non-ionizing electromagnetic radiation) or lead to concrete implementation decisions taken by the executive power (see below, with regard to the gaming incubators). But since “success has many fathers” (Peter Raeymaekers), these stories are usually harder to trace back to the institute’s work and contribution.

6.3.6 Quality control

The reviewing mechanism for the set-up of the annual working program ensures a high degree of political independence. The set-up of the annual working program goes through several stages of reviewing and amendments and is based on a multiannual trend study. The latter includes TA colleagues from the EPTA network as well as the viWTA/IST Board members (MPs and representatives of the scientific community). Relevant parliamentary committees as well as Flemish knowledge institutes are also being consulted.

Some additional procedures were taken to ensure public transparency and accountability of the working program and a better distinction between strategic and operational management.

On a project level, there is a management committee and an advisory committee that also relies on external people and assures the quality during the life cycle of the project.

Regarding the scientific results, there is a peer review mechanism that ensures a high scientific quality of the institute's scientific reports⁴³. External expert(s) and the viWTA/IST staff review the draft text of the scientific report and the authors respond to those review comments. Before the scientific report is presented to the viWTA/IST Board, the project manager searches and contacts minimally one external reviewer with relevant expertise. The reviewer(s) receives a checklist with evaluation criteria (e.g. the adequacy of the problem definition and research methodologies, the quality of analysis and the presentation of the results) and is asked to assess the quality of the text according to this list and to come to a motivated conclusion. There are three possibilities:

- The text meets the scientific quality needs in the relevant expertise domain and can be published as such.
- The text can meet the scientific needs in the relevant expertise domain if a limited number of remarks are taken into account.
- The text does not meet the scientific needs in the relevant expertise domain and the needed changes are too profound and voluminous to be handled within the response phase of the authors (significantly more than 10 working days). If this occurs, then the review process blocks the further publication of this text and solutions are sought for to unlock this situation.

The review process takes 3 weeks on the average and the authors get about 10 working days to respond to the review comments. The author researcher(s) receive a document with remarks and suggestions from the reviewers and from viWTA/IST. It is a single-blinded review process; the reviewer knows the identity of the author(s), but the reviewer's comments are presented anonymously to the researchers. The author(s) do not have to agree on all review comments. If they do not wish to incorporate review comments, then they have to motivate this decision. The approval of the changes made is done by the viWTA/IST staff and the final approval of the document as a whole is done by the Board.

Finally, in order to ensure an appropriate translation of the data that have been collected and analyzed into relevant, understandable and useful TA knowledge for the parliamentarians, the institute heavily relies on communication specialists, such as science journalists or science writers.

⁴³ In case the viWTA/IST chooses not to publish a scientific report, but immediately wants to publish an IST dossier, then a reading committee can be appointed. This committee does not do a single- or double-blinded review, but it gives advice to the authors on the readability, consistency and accuracy of the text for policy makers and for other interested stakeholders.

6.3.7 Reflection on the criteria of success

Given the close association with the Parliament, the main effects on decision-making processes happen within the Parliament. The impact ranges from information and improving knowledge to a more active role in forming opinions and initializing actions⁴⁴.

Raising knowledge

The short assignments and evaluations ordered by the Parliament tend to become more important over time. They mainly call for responsive reactions from viWTA/IST, even though some members of the staff also proactively submit some documentation material to the parliamentarians. This kind of work often limits itself to the knowledge/awareness building dimension.

The media are clearly identified as an important success factor for reaching out and to trigger the attention, even of the MPs themselves. A media strategy can create the conditions to do some advocacy work but is not sufficient as such.

Other success factors include the quality of the project and its methods and findings. The institute usually receives valuable feedback from the PTA research community. An appropriate communication strategy all along the project is also very important in order to increase its visibility and chances of success. A good example of a communication instrument was the brochure on nanotechnologies. It was taken up by a major newspaper and published as an insert in its weekend edition.

Forming opinions

viWTA/IST stimulates and structures the social debate around new technologies and by doing so may have a considerable impact on opinion forming. The institute also tries to bring in scientific figures and facts to counterbalance pure ideological (and sometimes uninformed) debates in the Parliament.

For all the different target groups, the interviewees mentioned the important impact of viWTA/IST's work on individuals (whether they be parliamentarians or lay people) rather than on organisations or professional groups. On the stakeholder and general public side too, research groups or even lay persons involved in IST projects are obviously willing to change their mind-set and generally very enthusiastic about their having been involved. But it is hard for the institution to achieve the certainty of having an impact on opinion forming, as it is hard to argue that a personal impact persists in the long run or is taken up at a higher, organisational level.

Initializing actions

With regard to initializing actions, the reports which viWTA/IST delivers to the Parliament are tailored to its (limited) regional competences. "IST has the mandate to formulate recommendations. Several recommendations have been used in resolutions that have been endorsed by the Parliament (e.g. resolutions on non-ionizing radiation and on nanotechnology)" (Technopolis, 2011). A parliamentary resolution is a non-binding advice of the Parliament to the Government to implement or come up with a certain policy. Influence is harder to measure when, thanks to viWTA/IST's work, a subject may come to the agenda but not always with an explicit reference to its origin. Sometimes projects do not lead to policy actions because they touch on federal competences (e.g. energy issues). Nevertheless, the research of the institute is not legally restricted to solely Flemish competences and it is possible that some studies will be taken up again after years, especially when competences are subject to redistribution.

⁴⁴ Hennen et al., 2004. Towards a Framework for Assessing the impact of Technology Assessment in M. Decker & M. Ladikas (Eds.) Bridges between Science, Society and Policy; Technology Assessment - Methods and Impacts. Heidelberg, Germany : Springer.

An example of a successful project is the smaller study on the gaming industry. In this particular case, the effect can be considered as a linear evolution. At the start of the project, there was a general feeling of a hostile public opinion towards computer games: games were traditionally perceived as a source of violence or at best as a pure leisure activity. However, the study led to a debate (also in the Parliament) that changed the public opinion on computer games and even resulted in a policy change: since then Flanders has invested in several incubators to encourage and stimulate its gaming industry.

The institute itself measures its impact in terms of explicit references to viWTA/IST reports or dossiers in parliamentary resolutions, quotes in the press, reports delivered to committees or the number of visits on websites. The impact is hard to assess anyway and is pretty much related to what is going on in the media. There is a constant fight for media attention, which is an important way of getting the parliamentarians' attention.

6.4 Case study: Digital inclusion project

The digital society program of viWTA/IST looks at the impact of Information and Communication Technologies (ICT) on society and has resulted in projects such as ICT & elderly (2004), ICT & poor people (2006), ICT & privacy (2006), Game on (2007) and Intelligent transport systems (2009). In 2009 and 2010, this program focused on the impact of the digital divide (and digital inclusion, i.e. the whole of measures to remediate digital exclusion mechanisms causing a digital divide) in the Flemish society. It thereto organized two activities: a TA study on the digital divide in Flanders and a three day technology festival on digital Flanders. These two activities are further labelled as the digital inclusion project. Both were highly interconnected: viWTA/IST released the results of the TA study during the technology festival and digital exclusion was a leitmotif during this technology festival. The results of the digital inclusion project were released in November 2010, during the Belgian presidency of the European Union and the European Year against Poverty and Social Exclusion.

Hence, this case study constitutes of two components that are linked together: the TA study, with focus on the policy support function of viWTA/IST's mission, and the technology festival, with focus on the public dialogue function of viWTA/IST's mission. In this section we make a short life cycle analysis of both components and focus on the links with politics.

6.4.1 Political relevance of the digital inclusion project

The digitization of our society is no longer an emerging trend but a daily reality: health, mobility, home, office, public services, media, culture, entertainment,... are domains that are impacted by digital applications and services. Their omnipresence has had a significant societal impact over the last years and their impact is expected to increase over the coming years. Information is created, shared and consumed at an ever-increasing speed. The positive societal effects of digital society generally refer to the 'anyplace anywhere, anytime' availability of information and communication possibilities for a higher quality of life. The negative societal effects emphasize that this 'anyplace anywhere, anytime' availability does not apply to everybody (e.g. digital divide / digital exclusion), does not improve everybody's life (e.g. digital harassment / cyber bullying) and may cause derailed societal behaviour (e.g. violent game behaviour in real life / social media addiction).

Over the years, several political initiatives in Flanders have been launched to govern our digitizing society. In 2005, it was decided in the Flemish Parliament to set up an *ad hoc* committee 'Digital Flanders'. With a

set of parliamentary hearings, this committee aimed at delivering a policy note on the strengths, weaknesses, opportunities and threats concerning digital developments in Flanders. In July 2008, this committee delivered its societal policy note and the Flemish Parliament suggested to the Flemish government to take appropriate steps in the domains of e-mobility, e-culture, e-health/e-care and e-government.

On the one hand, the increasing importance of digital applications and services require people to develop and maintain appropriate (digital) skills. Motivation, user experience, education and a social network are hereto crucial. People, who do not possess the necessary skills, risk to be excluded partially or fully in our contemporary society. On the other hand, an organized reflection on the impact of our digitizing society with a broad input from politicians, companies, civil society organisations and the general public did not take place in Flanders so far. In 2008, viWTA/IST expressed therefore the dual need to further explore the societal issue of digital exclusion and to bring politicians, civil society organisations, digital media experts and citizens together to contemplate on our digitizing society and to discuss tangible issues.

6.4.2 LIFE-cycle of the digital inclusion project

TA study on digital divide

The actual research and the production of the scientific report took place between November 2009 and September 2010 by a research group of the Vrije Universiteit Brussel. There were three main parts in the research project: a literature review on digital divide, a survey and a brainstorm session.

- The literature review focused on recent theoretical approaches to digital exclusion and examines what changes took place regarding the notion of the digital divide and why these changes occurred. It also explored which new elements should be taken into account to explain and counter digital exclusion. Special attention was given to non-traditional aspects like the importance of social networks and the role of lifestyles and life stages.
- Next, a meaningful inventory of existing digital inclusion initiatives was made. By way of an online questionnaire nearly 400 initiatives were mapped and analyzed according to 1) their modus operandi – e.g. number of computers, target groups, type of courses; 2) their pedagogical approach – e.g. group size, type of coaching, learning materials, demand or supply driven approach; and 3) their sustainability – e.g. financing mechanisms, embedding in other organisations, collaboration with local authorities.
- Finally, a brainstorm session with representatives of various organisations was organized. During the brainstorm participants worked towards the identification of problems related to the implementation of digital inclusion projects, towards an in-depth discussion about appropriate solutions and suitable policy recommendations.

In September to November 2010 and based on the insights from the TA study, viWTA/IST produced a dossier and a policy recommendation brochure (with a set of 22 recommendations clustered in 5 action areas). This project part therefore resulted in three publications:

- A scientific report, entitled ‘ Second order digital divide in Flanders’, 186 pages
- A dossier, entitled ‘Digital inclusion in Flanders’, 63 pages
- A policy recommendations brochure, entitled ‘Digital inclusion in Flanders’, 23 pages
- An interactive database with over 350 initiatives working on digital inclusion

Technology festival e-Dinges

e-Dinges was a three-day event in November 2010 in the Flemish Parliament on the impact of the digitizing society. It followed a technology festival⁴⁵ approach and thus offered a blunt mix of infotainment activities for a diversity of stakeholders, including citizens, civil society organisations, policymakers and digital media experts. A technology festival offers the possibility to step away from (very) formal lectures and debates. It challenges organizers to come up with a diverse program of activities that both inform and entertain the event's visitors (infotainment). The audience had to be challenged to participate as much as possible in the activities.

e-Dinges was an initiative of the viWTA/IST, in close collaboration with the Interdisciplinary Institute for Broadband Technology (IBBT) and the Vlaams Steunpunt Nieuwe Geletterdheid (VSNG/LINC - Flemish Centre New Literacy).

On March 18, 2008, the scientific secretariat submitted a proposal to the viWTA/IST Board to start planning a second technology festival. The initial set of central questions for the event was framed as follows:

'How does the digital revolution shape daily life in Flanders?'

'What happens today within 5 central key areas: culture, health, education, mobility, and policy?'

'What will be the digital Flanders of tomorrow?'

On the one hand, the event should show visitors common and realistic future applications of ICT. On the other hand, it should offer a variety of activities that structure and stimulate the societal debate on the use and usefulness of such present and future applications. The traditional range of activities should include debates, panel discussions and lectures and should be complemented with more creative approaches such as art performances, science theatre and humoristic activities.

In the final version, the event was divided into three consecutive parts: the opening ceremony e-Dinges Awards on a Thursday evening, the e-Dinges workshop day on Friday and the e-Dinges festival day on Saturday.

- The e-Dinges awards was a two hour event that focused on new scientific insights and field work concerning digital divide and suggestions to overcome the negative impact of digital exclusion. It hereto highlighted innovative Flemish projects that try to smooth away or to reduce the inequality as an effect of ICT. Over 100 representatives from the Flemish political and industrial world, from civil society and research institutes were present at e-Dinges awards. 130 professionals, mainly scientific experts, politicians and representatives of digital inclusion initiatives attended the e-Dinges Awards.
- With more than 30 workshops and debates, the e-Dinges workshop day followed the 'teach-the-teacher' approach and provided inspirational tips, testimonials and hands-on tutorials for individuals and organisations, which are professionally involved with groups within society that lack one or more digital skills in order to participate satisfactorily. 140 participants attended the workshops. Most participants did at least two workshops.
- The e-Dinges festival day encouraged interactions between visitors, exhibits and experts on the (future) impact of digital society, and explicitly adopted different activities to illustrate the technological and societal aspects of existing and emerging digital (r)evolutions as graphically as possible: interactive demonstrations, workshops, lectures, debates, interviews, artistic performances, contests, etcetera. The technology festival day offered visitors an opportunity to collect information

⁴⁵ The technology festival methodology was not new to the IST. In November 2007, viWTA/IST had organized its first technology festival on the topic of nanosciences and nanotechnologies, the NanoNu (NanoNow) event.

on new ICT developments, to gather impressions of the impact of ICT, and to formulate and exchange opinions and concerns about the interaction between ICT and society and share them with other visitors and the exhibitors. Infotainment, interaction and respectful dialogue were key words here. Most festival activities focused on bringing interested lay persons in contact with the opinions of experts, MPs and artists, and with existing and possible applications of the technologies at stake. Some activities, such as a panel debate on e-government focused on bringing experts and MPs together to share knowledge. About 300 people visited the e-Dinges festival day.

During e-Dinges, an exposition area for the visitors was installed. This exposition area with 30 demo stands divided into 5 thematic zones was not meant as a technology trade show focusing on providing technical and commercial information. It explicitly aimed at offering a spectrum of applications and developments and each of its activities explicitly integrates a social, i.e. ethical, legal and/or economical dimension. It not only encouraged interactions between visitors and exhibitors but also explicitly linked together technological and social aspects.

6.4.3 Linking the digital inclusion project with politics

During the preparatory phase, viWTA/IST informed the political members of the viWTA/IST Board on the state of the art in the TA study and the technology festival and together they looked for possible interactions between both activities and politicians. During e-Dinges there were several moments in which politicians were involved:

- Politicians from Government and Parliament were invited to attend the e-Dinges opening session, the e-Dinges Awards. The chairman of the Flemish Parliament opened the awards ceremony; the vice-president of the Flemish Parliament was chairman of the jury selecting the winning digital inclusion initiatives and handed over the prizes. The Minister of innovation and poverty reduction held a closing speech on present and further policy actions on digital inclusions in Flanders.
- On Friday 19 November 2010, there was a panel session on e-government for policymakers and the workshop participants.
- On Saturday 20 November 2010, there was a debate entitled 'Meet the politician 2.0' with politicians and social media specialists.
- The closure event had two parts. The first part was a reflection of Flemish representatives on recent policy and the most important future policy actions on the digital policy agenda for Flanders. The second part was a concluding statement debate with the director of viWTA/IST, the director of IBBT and the chairman of the Flemish organisation for digital literacy.
- The organizers of e-Dinges made sure that all democratic political parties of Flanders were involved in one or more activities.
- On December 17 2010, the Flemish government organized the Roundtable i-Flanders. One of the main themes was digital divide & digital inclusion and explicit reference was made to the study results of viWTA/IST.
- On February 15 2011, viWTA/IST presented the results of its project 'Digital inclusion in Flanders' in a joint hearing of the Committee of Media, Youth and Culture and the Committee of Education and Equal opportunities. It invited the 3 winners of the e-Dinges Awards in order to testify. About 10 to 15 parliamentarians attended this joint hearing.

Contacting MPs and the Minister for Innovation for giving a speech during e-Dinges Awards was not difficult. On the other hand, there was surprisingly⁴⁶ little interest from politicians to participate in the ‘Meet the politician 2.0’ activity during the public event day. During the e-Dinges Awards, the policy recommendations were presented to the Flemish Parliament. Few MPs attended the e-Dinges Awards itself, explicitly programmed between 18 and 20 p.m., hence after their parliamentary activities. During the other days of the event, less than 5 MPs have attended one or more of the activities in the audience.

There was no direct political impact (follow-up of political hearings, interpellations of one or more Ministers in the plenary parliamentary session or initiative from a commission to submit a resolution, i.e. a non-binding advice to the Flemish government) on the results of the digital inclusions’ research project of the IST.

6.4.4 Evaluation of the digital inclusion project

The digital inclusion project was a combination of a TA study and a technology festival. It combined more traditional TA research with an ambitious infotainment event. Both parts were coordinated by the same project manager in order maximize the mutual input and transfer throughout the project.

- The e-Dinges Awards resulted in a very good collaboration with the civil society organisations on digital inclusion. The awards ceremony with a mix of study results, policy recommendations and digital inclusion testimonies was appreciated by the attendees, the digital inclusion organisations and interested politicians. The formula of the E-dinges awards has been taken over by the Vlaams Steunpunt Nieuwe Geletterdheid (VSNG/LINC - Flemish Centre New Literacy). From 2012 on, it will organize annually a similar awards ceremony entitled ‘E-Award’.
- Generally speaking, the workshop day for professionals was well appreciated by the participants, according to personal feedback and evaluation forms. Maybe there were too many workshops: some participants found it too difficult to make a choice. Maybe the festival program formula (too much to choose from) for the workshop day was not necessary. Maybe one or a few fixed programs for certain target groups would have been appropriate.
- A qualitative festival program did not seem to be sufficient to attract significant numbers of citizens and MPs to the event zone. Possible explanations for the lower than expected attendance during the festival day can be
 - the limited impact of social media to attract general public;
 - the limited impact of the promotional video on a public broadcasting channel: number of shows too little? message unclear?
 - the limited impact of posters distributed on poster publicity panels in the streets, publicity leaflets in bars, restaurants, educational institutions, cultural centers and libraries,
 - the venue location (Brussels and complex building with spread event zone)
- Apart from the moderate political interest in participating and in speaking during the e-Dinges Awards and in being panelists during the workshop day and festival day, there was also very little interest of MPs in attending the activities during e-Dinges.

The project manager of e-Dinges evaluated the organisation of the event and the event itself and presented this evaluation to the viWTA/IST Board. In line with this evaluation, the Board concluded that a multi-day event with explicit focus on attracting significant numbers of the general public to

⁴⁶ Surprisingly, because in anticipation of the event, the organizers of e-Dinges saw little risks for politicians to participate in this activity. On the contrary, it was thought that they would see this activity as an opportunity to put themselves positively in the picture and therefore would be eager to participate.

the Flemish Parliament should not be a goal for future viWTA/IST activities. Should the need arise, small scale events, mini-technology festivals, with a more explicit focus on MPs are still possible.

e-Dinges was the last large scale event of viWTA/IST until its closure on December 31 2012. Some beforehand criteria (such as number of visitors and lack of interest of MPs) were not achieved. Although there is no direct correlation, the event took place in the month that the political working group on the finality of 3 out of 4 paraparliamentary institutes was installed in the Flemish parliament (November 2010). This case-study and such hindsight observations might leave the reader with some ambivalent appreciations to what extent this event contributed to the closure decision. The viWTA/IST author of this document is aware that presenting this case study is not without ambivalence. But given the dual mission for viWTA/IST (stimulating public dialogue and informing policymakers on the impact of S&T issues), viWTA/IST has invested significantly in the implementation of the technology festival formula and it complemented this methodology with its traditional communication tools towards MPs such as a scientific report, a dossier, policy recommendations and a policy hearing. This complex set of TA activities targeting broader public and policy makers is prone to the 'too much input, too little impact' critique and shows the vulnerability of TA activities attempting to bring together science & technology promoters, politics and broader society.

6.5 Future challenges for policy-oriented TA in Flanders

The parliament's decision in October 2011 to close viWTA/IST by the end of 2012 emphasized a period of significant uncertainty concerning the future of policy oriented Technology Assessment in Flanders and threatened to create an institutional vacuum for decision-supporting and participatory TA in Flanders. In the months following this decision, two organisations were identified by viWTA/IST, the Flemish Parliament and the Flemish government as potential opportunity structures for integrating the TA research function:

- the Flemish Council for Science and Innovation (VRWI)
- the Flemish Institute for Technological Research (VITO)

VRWI is the independent Flemish strategic advisory council that can act proactively or on request of the government and the parliament for the policy areas science and innovation. VITO is an independent and customer-oriented research organisation that provides innovative technological solutions and scientifically based advice. Hence, while the first is much more policy oriented with links to government and parliament, the latter is much more research oriented with links to academia, industry and government.

Several choices had to be made by the key players, i.e. the Flemish parliament and the Flemish government:

Concerning the TA advice function:

The Flemish parliament had to decide if and how it wants to incorporate the TA advise function in its own activities. In the months following October 2011 it became soon clear that the initial suggestion to implement the introduction of the Catalan parliamentary TA model into the Flemish parliament was abandoned.

Concerning the TA research function:

The Flemish parliament's decision of October 2011 was clear: the parliament wished no longer to take up any role in TA research activities and asked the Flemish government whether it is interested in taking over TA activities of viWTA/IST.

In July 2012, the Flemish government took the decision to relocate the TA research activities to the Flemish Institute for Technological Research (VITO). This involves the transfer of a significant part of viWTA/IST's budget from the parliament to the government and the opportunity for the current TA practitioners at

viWTA/IST to start working at VITO. At present (August 2012), the concrete implementation of the government's decision is still to be initiated. This include issues such as

- How to include TA (like) activities as part of the portfolio of VITO activities/task.
- What are the government's visions on the future of policy oriented TA activities in the VITO context?
- Will there be a link between TA research and TA policy advise activities?
- What about the present dual mission of viWTA/IST, stimulating public debate and advising policy makers on science and technology issues? Will this dual mission be part of the TA (like) activities in VITO?
- ...

For sure, the parliament's decision to close viWTA/IST has highlighted the need to reflect on the de- and re-institutionalisation process of policy oriented TA activities in Flanders. For months it was unsure whether such kind of activities would disappear or re-emerge in a different institutional context. The government's decision to integrate TA activities of viWTA/IST in VITO offers a unique opportunity to tackle limitations of the (parliamentary) TA model that has been used in Flanders of the past 10 years. It is to be expected that new ways of linking and embedding TA expertise with other innovation stakeholders and discourses will be developed over the coming months and years. Expertise that has been built up by viWTA/IST is useful in this matter but will also to be matched with the ever evolving science and innovation landscape. This includes:

- to find an effective balance between TA activities stimulating public discourses and supporting existing and new policy initiatives on science and technology issues,
- to position TA in the Flemish innovation landscape as a visible knowledge actor that is a contact point for politicians, interested citizens and science, technology & innovation promoters,
- to link TA with other science and innovation discourses that are used in national and transnational policy areas, academia and industry, and
- to construct organized reflection on short-term, salient and immediately political/societal relevant issues *and* long-term, slow and 'under the radar' collective interest goals.

Chapter 7 Parliamentary TA in Germany

Leonhard Hennen (Institute for Technology Assessment and Systems Analysis, KIT), Linda Nierling (Institute for Technology Assessment and Systems Analysis, KIT) and Lenka Hebakova (Technology Centre ASCR)

7.1 The institutionalisation of TAB

7.1.1 History

As in other industrialized countries, public debates on »Technology Assessment« started in Germany in the early nineteen-seventies, prompted by the creation of the Office of Technology Assessment (OTA) of the U.S. Congress and the prior intensive debate on TA and its institutionalisation⁴⁷. There were two major driving forces. The perceived lack of scientific support for parliament that had to deal with more and more technology related issues and the growing awareness of negative (at that time mainly environmental) unintended consequences of technological development that led to the emergence of ultimately powerful public interest groups.

With respect to the debate on institutionalisation of parliamentary TA the visit of a delegation of the German parliament to OTA (USA) in 1974 can be regarded as a starting point. Impressed by the idea of technology assessment in the US, a parliamentary discussion lasting about 16 years started. At that time Germany was on the one hand experiencing a heated debate about the country's technological competitiveness and "*politicians felt the danger that you could fall back in the race as a technological champion*" (this and the following quotes in this chapter are from interviews with TAB staffers). On the other hand the importance of technology for public welfare was critically discussed in society at that time, this not only applied to the environmental effects of modern technology and the risks of nuclear energy but also e.g. to the possible societal impacts of emerging information technologies. The critical reflection of the interdependence of social and technological change as well as the role of S&T policy making was also taken up in academia and research. Research on the role of policy advice and options for political steering was driven by groups of researchers at the Social Science Research Centre (WZB) in Berlin as well as at the Research Centre Karlsruhe (currently KIT). These two institutions can be regarded as having led the debate about TA in Germany at that time.

With regard to both problems mentioned above - the critical social debate and the decisive economic role of S&T - parliamentarians felt the need to be better informed; especially they perceived an "*informational dependence*" on the executive branch of government, and experts from industry respectively. Thus the demand for an agency "*only for themselves*" that could provide unbiased and exhaustive information on technology issues was widely shared among parliamentarians from different political viewpoints.

The question now was mainly how to institutionalize this agency in the shape of a TA unit. There were initiatives from all parties during the 1970s and 1980s, with strongest initiatives from parliamentary groups of the opposition. Although there was no political group definitely in opposition to the idea of TA, the "*TA advocates*" were not leading parliamentary figures. Thus the debate was not forced to come to a decision

⁴⁷ The following is based on interview with staff of TAB, with the chairwomen of the Research Committee, and with stakeholders from TAB (NGO representative, science journalist, scientific expert) as well as on available documents. The history of TA in Germany is well documented. See for example Paschen 2000 and contributions in Petermann/Coenen (1999).

until, in the 1980s, two so called Enquete Commissions⁴⁸ on the subject of TA were set up to come to terms with the various ideas on the institutional model of parliamentary TA. Several proposals were discussed by the two Enquete Commissions, in which prominent representatives of the Social Science Research Centre Berlin (WZB) and the Research Centre Karlsruhe were involved as expert members of the commission.

From outside the parliament there was opposition to the idea of TA mainly from two groups – on the one hand from representatives of the German employers which feared a “*growing bureaucracy*” that might hinder technological innovation in Germany. This group especially opposed a large scientific institution. On the other hand, the Greens – representing the critical social movement - felt “*the danger that TA could only serve as a technology push without critical reflection*” and that TA would be used to “*create public acceptance*” without reflecting theoretical impact and possible risks. Thus there was some discussion about the right model for TA at the German Parliament. The Green party was in favour of an academy serving as platform for social debate, the Social Democrats favoured a TA commission within the parliament supported by a scientific unit as part of the parliamentary administration. Both models involved scientific staff of 40 to 50 researchers. In 1989 the parliamentary majority voted for the proposal of the conservative Christian Democrats: a small unit, which – as the “lowest common denominator” – was then also generally accepted by the other parties.

Quote from the report and the recommendation for decision of the Committee for Research from October 1989 that was the basis for the parliamentary decision to set up a TA unit at the German Parliament (own translation):

“The dynamics of technological progress are a prerequisite for the economic and social performance of our country, for the protection of our natural livelihood as well as for the solution of global problems of mankind. New technologies, however, can also bear unintended consequences for man and nature. The German Bundestag must contribute to taking advantage of the benefits of new technologies and to minimizing associated risks. This implies shaping of the conditions of technological progress as well as contributing to public dialogue. It must be the aim of political debate on science and technology to reduce irrationality and to build up orientation and trust. In performing its duties in this respect the German Bundestag draws on several tools which are proven and tested, such as Enquete-commissions, hearings and the scientific parliamentary service. Nevertheless, in the face of new dimensions of the technically feasible and of an increased pace of technological change, the parliament’s need to be properly informed has grown. Therefore an extension of the existing instruments by setting up a permanently available unit for consultation and advice is necessary.”

Source: *Beschlussempfehlung und Bericht des Ausschusses für Forschung und Technologie*, Drs. 11/5489 vom 26. Oktober 1989

The proposal for the TA unit contained two main elements: A political steering group and an operational TA-unit. The political steering group was introduced to overcome the scepticism, that TA could become a “*bureaucratic monster*” regulating German industry. These “bureaucratic fears” were also the reason that no advisory board was introduced (as it is often the case in other countries with representatives from industry, trade unions etc.). The second element was the idea to keep the unit “*outside (but not too far away from)*” the structures of the parliament and the administration of the parliament respectively. Therefore an external scientific institution was selected to set up and manage the TA-unit for a period of 3 years, later extended to 5 years. This time frame was a signal for a flexible model having the possibility to change the directions or instruments of the unit if needed. At present, there is call for tender for the TA-unit every 5 years. The selected organisational model has two key features: The governing political organ and the operational TA

⁴⁸An “Enquete Commission” is a kind of study commission comprising both parliamentarians as well as external experts.

unit. The Research and Technology Committee, which was given the responsibility for initiating TA investigations and their political control, was renamed “Committee for Research, Technology and Technology Assessment”. The Committee’s secretariat was enlarged in line with these new responsibilities. Under the terms of the Bundestag resolution, an appropriate scientific institution outside parliament must be selected through tender and commissioned to establish and operate the TA unit. The legal basis for this is an addendum to section 56 of the Bundestag’s Rules of Procedure. The TA unit to be established was to work exclusively for the Bundestag (one-client institution). It was to ensure parliament-specific presentation and communication of the results of its work.

It is the mission of the unit to analyse specific issues in science and technology commissioned by German Parliament and its committees and present the findings in a timely and structured fashion. Technology assessment at the German parliament has the following tasks:

- to analyse the potentials of new scientific and technological developments and explore the associated opportunities,
- to examine the framework conditions for implementing scientific and technological developments,
- to analyse potential impacts in a comprehensive forecast, pinpoint the opportunities offered by using a technology and indicate the possibilities for avoiding or reducing its risks.

All this is the basis for

- the development of alternative options for the policy-making process.

The primary aim is to supply the Parliament with information providing a scientific basis for its debates and decision making.

Following a tendering procedure and at the proposal of the then Committee on Research and Technology, a contract was signed on 29 August 1990 with the Karlsruhe Nuclear Research Centre for a three-year pilot phase and the Office of Technology Assessment at the German Bundestag (TAB) was founded. Since then it has been operated by the Institute for Technology Assessment and Systems Analysis (ITAS) – until 1995 the Department for Applied Systems Analysis (AFAS) – of the Karlsruhe Nuclear Research Centre, which later merged with the University of Karlsruhe to form Karlsruhe Institute of Technology (KIT).

After the conclusion of the pilot phase, the German Bundestag decided on 4 March 1993 to establish a permanent advisory institution “Technology Assessment (TA) at the German Bundestag” (printed paper 12/4193), as a result of the positive findings of the responsible Committee for Research, Technology and Technology Assessment. The existing contract for the operation of the TAB was extended by five years until 1998. In August 1998, based on the successful cooperation with the operator of the TAB, a further contract was signed for five years.

In 2002, the Committee for Education, Research and Technology Assessment, which is responsible for selecting a suitable operator, decided to complete the time-consuming application and selection procedures for the future operation of the TAB, in the 14th electoral period already. Following a call for applicants in national media, the Committee invited five candidates to present their concepts of technology assessment at the German Bundestag in its session on 15 May 2002. In its session on 12 June 2002, it was decided that the (then) Karlsruhe Research Centre would continue to operate the TAB until 28 August 2008 and cooperate in specific areas with the Fraunhofer Institute for Systems and Innovation Research (ISI). In 2008, the contract was extended for another five years.

After the decision on the organisational model once had been taken in 1990 the debate about the different models suggested by different parliamentary groups at the end of the 1980ies actually never had been taken up again. This was first due to the fact that for a long period of time the majority in the parliament did not

change. However, also after a new majority of social democrats and greens was established in parliament in 1998, this majority did not try to open up the institutionalisation debate again in order to push their own organisational ideas. This can be seen as a result of the fact that the once established model had proved to work fine for all parliamentary groups. Moreover, it meanwhile was regarded to be decisive for the success of the model that it is supported by all parties represented in the parliament. Nobody obviously wanted to jeopardize the existing broad consensus and support for the existing TAB model.

7.1.2 The model of institutionalisation

The TAB office in Berlin currently houses eight scientists from various disciplines, supported on a case by case basis by researchers from ITAS in Karlsruhe. Since September 2003, Karlsruhe Institute of Technology has operated TAB in collaboration with the Fraunhofer-Institute for Systems and Innovation Research (ISI) in Karlsruhe. TAB is member of the European Parliamentary Technology Assessment (EPTA) network and of the German-language TA network (NTA).

In the annual budget of the German Bundestag 2.045.000 Euro are earmarked for TA. This comprises 1.432.000 Euro for institutional funding of the TA unit (staff, premises). 400.000 Euro p.a. are used for the funding of activities by the cooperating Fraunhofer Institute and 613.000 Euros p.a. remain to buy in outside expertise for the TA project work.

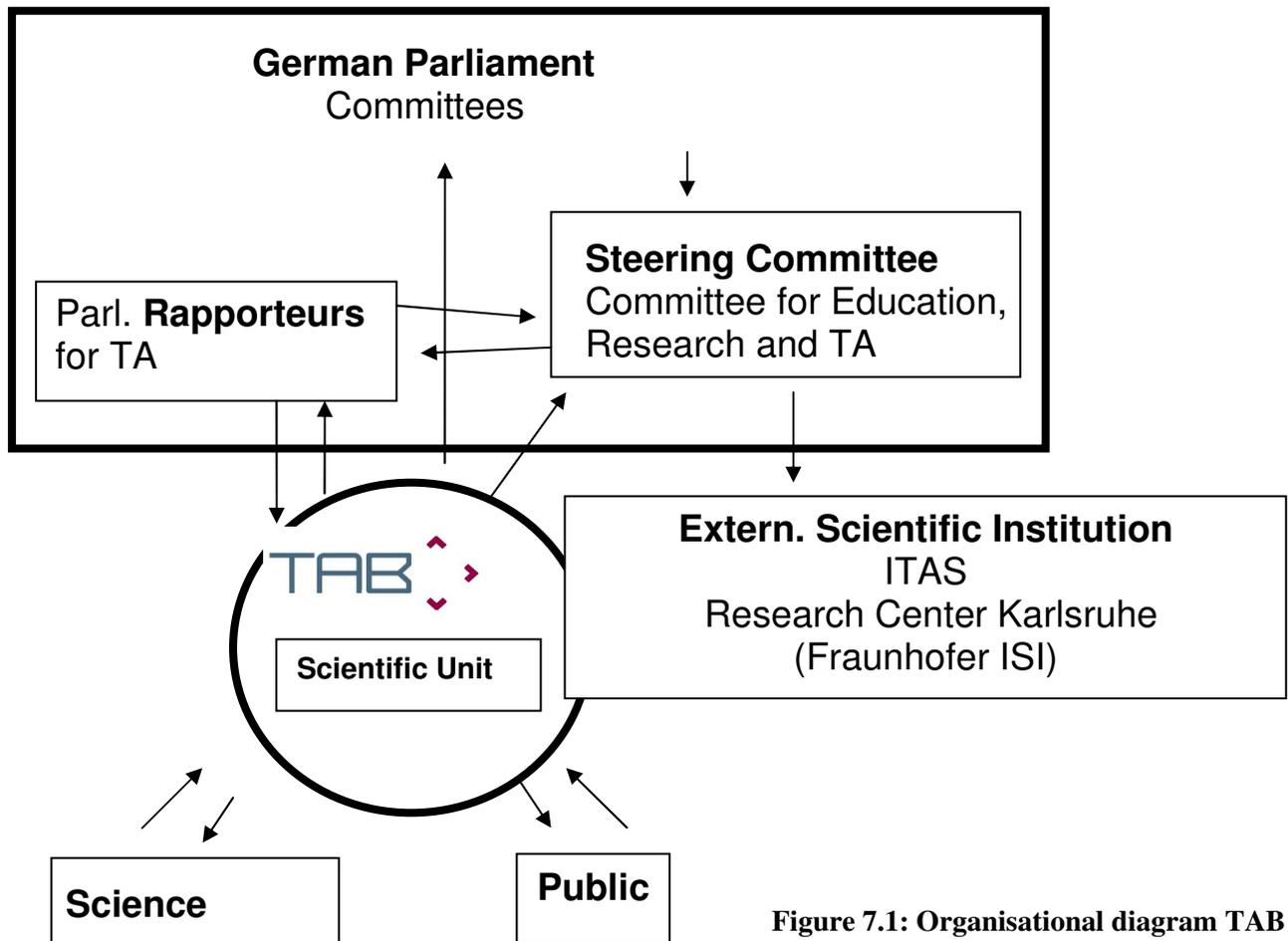


Figure 7.1: Organisational diagram TAB

TAB is operated by the Karlsruhe Institute of Technology (KIT) under a contract with the German Bundestag. TAB is an independent scientific unit of the Institute for Technology Assessment and System Analysis (ITAS). TAB and ITAS jointly conduct research as well as develop concepts and methods of technology assessment. The Director of TAB is appointed by KIT in consultation with the responsible Committee on Education, Research and Technology Assessment. The director of TAB who also heads the Institute for Technology Assessment and Systems Analysis (ITAS) at the Karlsruhe Institute of Technology, is responsible for the scientific results of TAB's work and represents TAB vis à vis the German Parliament.

The director of TAB and his or her staff are not bound in matters of content by instructions of the Karlsruhe Institute of Technology with respect to any tasks assigned to them by the Bundestag. The director of TAB has responsibility for the scientific accuracy of the results produced by TAB and also has sole responsibility for selecting TAB staff.

As TAB's directing body, the Committee on Education, Research and Technology Assessment is chiefly responsible for deciding on the work programme, approving final reports, and communicating with the Members of Parliament and its committees. It has a standing "TA rapporteur group", with one member from each parliamentary political party. This group prepares all the decisions on TAB to be taken by the Committee, from the decision to carry out a TA project through to approval of the final report. The group of rapporteurs functions as the direct link between parliament and the scientific unit.

7.2 Institutional context of TAB

On the federal level there are many and varied institutions dealing with S&T governance and TA related issues (such as ethics, risk assessment, environmental impact assessment, etc.). There are institutions established and controlled by the government with a definite mission of informing and advising politics and societal debate such as, most prominently, the National Ethics Councils (mainly on life sciences), or the Council of Sustainable Development (dealing with and promoting the concept of sustainability for a broad variety of societal and economic fields). There are other governmental advisory bodies with a – compared to the already mentioned institutions – relatively low public profile and visibility established at the level of ministries. Apart from that there are many advisory bodies serving the needs of professional non-governmental stakeholder institutions such as science organisations or institutes linked with civil society organisations. And there are – last but not least – many independent research or academic institutions active in the field of S&T and TA, which are involved with their expertise in societal and political debates – be it routinely and institutionalised or on a case by case basis. There also is strong tradition of environmental activism in Germany. Starting from the opposition to nuclear power and the engagement for nature conservation, biotechnology and its application, especially genetically modified plants and foods ("Grüne Gentechnik") have become a central topic for environmental and civil rights groups. Civil society organisations play a major role not only in public debate but are also regularly invited to take part in policy making processes concerning science and technology issues as stakeholders

The field of technology assessment is covered by quite a number of public research institutions and universities as well as institutes run by private and civil society organisations. The German language TA network (NTA) (including Switzerland and Austria) according to its webpage (2011) includes 45 institutional members and more than 260 personal members – with around 440 persons subscribed to the network mailing list. University courses in TA and professorships in TA have been established at several universities. ITAS – the mother institution of TAB – is the largest and longest existing scientific institution in Germany dealing with technology assessment and systems analysis in theory and practice. Today, it has more than 100 scientific staff members, approximately half of whom are natural scientists or engineers while

the others have degrees in the social sciences or arts. ITAS has a kind of core position in the German TA community, as it is the host and organiser of the “Netzwerk TA” (NTA), and the publisher of the only German speaking TA journal: “TA in Theorie und Praxis (TATuP)”, also edited by members of ITAS staff.

ITAS conducts much research in third party funded projects and contract work. Important external clients and funding partners in politics are the German and the European Parliaments and – with regard to governments – the European Commission, federal and state ministries and authorities (e.g. Federal Environmental Agency). Companies and organisations from industry are potential clients, too. ITAS is divided into four research areas: Sustainable Development and Environment, Energy – Resources, Technologies, Systems; Innovation Processes and Impacts of Technology; Knowledge Society and Knowledge Policy.

The close connection to ITAS ensures that TAB has good access to the ongoing scientific discourse in the field of S&T policy making and can draw on in house support in many fields of expertise covered by the staff of ITAS. Moreover ITAS is part of the Karlsruhe Institute of Technology which employs more than 5000 researchers and includes institutes covering a wide range of scientific and engineering disciplines. Thus TAB as a unit of policy advice particularly for the German Parliament by being run by one of the leading research institutions in Germany is very well anchored in the scientific or academic world.

7.2.1 Target groups

In accordance with its mandate, the work of TAB is focused solely on the German Bundestag. An important role in parliamentary use and implementation is played by the committees to which TAB reports are forwarded for deliberation. These committees are crucial actors for the use and dissemination of the findings of TAB. Over time, the range of committees initiating TA studies (and discussing TAB reports) has grown considerably.

Besides this primary audience, all the other Members of Parliament, parliamentary committees, staffs of the parliamentary political parties and of individual Members of Parliament, and the Scientific Service of German Parliament comprise the audience for and potential users of the results of TA processes. Serving parliament’s information needs, there are also study commissions of the parliament (Enquete Commissions), with which TAB often has close informal contacts. The Federal and State ministries also follow the work of TAB with close interest. Finally, companies, government agencies, research institutions and educational institutions and – not least – interested members of the public also make use of TAB findings. That TAB reports are also appreciated as a source of information outside the parliament is supported by the expert interview: TAB reports are “*a very good source, when looking for what is going on and what is the state of the art in a certain field*”, and they are used in this way by his colleagues and himself, according to the interviewed expert.

Parliamentary TA at the German Parliament has only gradually over the years started to open up actively towards the general public. Communication of project results, e.g. by presentations during public sessions of the Committee, workshops with experts and interest groups, as well as press conferences and discussions enhance the visibility of parliamentary TA. In this way it becomes clear to a broad public that German Parliament is also looking beyond daily business, to take a scientifically well-based approach to long-term prospects in technological and social development. From the perspective of one MP involved in TAB’s work it is the most prominent task of TAB, to provide a knowledge base, “*...in order to enable us as parliamentarians to make our own assessment of opportunities as well as risks of new technological development and make our own decisions. Beyond that, we also want to use results of our TA studies to take part in public debates or to initiate such debates, as far the respective issue has so far not found its way into*

public awareness.” It was actually already stated in the decision to establish a TA unit at the parliament that TAB should contribute to the public debate. But during the first decade of work the focus clearly was on serving the parliamentary committees. Apparently with the establishment of fixed procedures and routines as well as trust in the unit there was more space in recent years to open up by organising public events or press conferences on TAB reports. From 2002 on, (report on “Health and ecological aspects of mobile telecommunications and transmitters”, see Bundestag 2010, 24) TAB and the Committee chose for several projects to organise a public presentation of and debate on TAB reports in the parliament – with invited representatives from the media, research, industry and civil society.

7.3 Organisation of work at TAB

Proposals for TA-studies can come from one or several of the parliamentary groups in the Committee for Education, Research and Technology Assessment as well as any of the other committees in the German Bundestag. During its two decades of existence TAB has managed to become a unit supporting a broad range of parliamentary committees. Actually the fact that TAB reports are initiated by and are subject of consultations of many parliamentary committees is regarded as being a success factor of the model in the 2010 evaluation report of the parliament (Bundestag 2010, 19).

New subjects do not come out of the blue, however. Parliamentarians are addressed by others and asked to take the initiative for a new TAB project on a particular subject of interest, as is clearly stated in the NGO interview. As for the setting up of new projects the reception in the parliament can also be influenced by the resonance that TAB reports find outside parliament, such as civil society organisations asking parliamentarians for their opinion on a TAB report. The NGOs and other societal actors might thus function as “*multiplicators*” for TAB even with respect to the parliament.

Under the guidance of the chair of the steering committee for TA, the TA-rapporteurs and the director of TAB discuss the political and factual relevance of requested topics. TAB submits a statement for every proposal on its scientific workability as well as considerations of the objectives, substance, and methods. Topics are then selected and unanimously presented to the committee for debate and decision. A proposal is accepted when a third of the committee members do not oppose it. This procedure ensures the political relevance of reports and its connection to the needs of parliamentary committees (Bundestag 2010, 15). The number of requests for TAB studies submitted by parliamentary groups and committees has grown continuously. In the first quarter of 2010 alone, 67 requests from almost all committees were sent to the steering committee for TA. TAB, due to restricted resources, had to combine several of the proposals in a reasonable way to at least cover a greater part of the demand. In the latest report of the parliamentary evaluation report of TAB this fact gave reason to stress that the budget of TAB has not been increased over the years and obviously is not sufficient to fully answer the increasing demand for TAB studies (Bundestag 2010, 16).

In the interview with members of the TAB staff the process of narrowing down the broad array of proposed subjects to a manageable set of projects is described as follows. All 64 proposals for projects – a heterogeneous set of issues and questions – were discussed intensively in the scientific unit: “*Are they relevant and scientifically feasible? Are they “too futuristic”? Has TAB sufficient expertise in this field to work with external experts on equal terms? Some of the proposed topics are emotionally charged in Germany and have been discussed for decades without any concrete result. Such topics are always delicate to assess. Sometimes topics are already covered by other German/European research projects, and then these questions are postponed until these projects provide results*”. In the actual case TAB finally proposed a

list of 13 topics, in which more than 30 questions of the MPs had been integrated. These topics were discussed jointly by TAB and the committee with the aim of coming to conclusions on a priority list. The whole procedure took around 3-4 months. However, 50% of the questions could not be covered and integrated in the working program for reason of restricted personal and budgetary capacities.

After decision by the Committee, TAB is responsible for the scientific and organisational implementation of the TA studies. The project team begins with intensive research and consultations with experts on relevant research issues and findings. These also help to identify opposing scientific opinions and controversial positions of various interest groups. For central issues defined for a study, TAB makes recommendations to the committee on expertise to be commissioned from external experts or scientific institutions. Cooperation with such external experts and their reports is a central element of project work.

Over the entire term of the project, the team monitors and analyses the ongoing scientific debates and related public and political discussions. Particularly when interim findings are available, workshops and expert meetings are organised to bring together scientific experts and Members of Parliament. Representatives of societal groups are frequently included. This also aims to promote communication between science, society and German Parliament and the transfer of knowledge and opinions, even before the completion of a project. The results of all activities are summarised by TAB, and the project is concluded with a final report.

7.3.1 Methods

The range of methods applied by TAB is rather restricted and guided by the clear mission of TAB to serve the committees of the Bundestag – it is mainly desk top research, interviews and working meetings to explore the issue at stake in a scientific manner. The focus of TAB activities is on producing TA reports – thus the work of TAB is mainly on fact finding and research. The work includes involvement of experts and stakeholders via interviews, workshops and other types of meetings. The model does “*not give that much room for experiments*”, states a member of the TAB staff, but TAB and Parliament in a learning process found a fine-tuned version of the existing model that works perfectly to serve the needs of the parliament.

7.3.2 Topics

TA projects and monitoring activities are central working areas for TAB. These areas have proved ideal, particularly as a means of channelling the numerous requests for topics received from the expert committees and parliamentary political parties into analytical processes suitable for the purposes of German Parliament.

- TA projects deal with complex issues of science and technology. Such projects apply a comprehensive, interdisciplinary approach and a long-term perspective (e.g. new materials, fuel cell technology, nanotechnology or e-commerce).
- Monitoring activities consider selected aspects of developments in science, technology and society (e.g. regulation, innovation, experience gained in other countries). Their thematic focus makes them particularly suitable for current issues. They are also helpful in identifying and determining the exact content of future and more comprehensive assessments. Finally, they contribute to strengthening the core competences of TAB in important areas (e.g. themes such as genetic diagnostics and gene therapy, energy supply, renewable raw materials, acceptance of new technologies).

These analytical approaches are used to open up specific additional prospects – for which the cooperation partner Fraunhofer-Institute for Systems and Innovation Research (ISI) is principally responsible:

- Future reports are intended to identify technological fields with relatively medium and long-term relevance which are expected to require parliamentary action. Among other things, this improves the committee's opportunities to put issues on the political agenda at an early stage.
- Policy benchmarking uses internationally comparative studies of policy approaches in other countries and political options for action being debated there, to contribute to the committee's ability to assess solutions in various countries and areas of technology.
- Innovation reports are intended to review current innovations in areas characterised by particularly rapid development, a high degree of sensitivity and a low level of empirical information.

The topics on which TAB conducts assessments cover a broad range of current scientific and technological issues with high relevance for politics. One focus is on the field of environment and health, examples are reports on environmental technologies and economics, medical technologies and ecological and health aspects of mobile telecommunication and transmitter stations. Another focus is on the dynamic and controversial issue of bio and gene technology. In this area, TAB has submitted reports on such topics as biotechnology and developing countries, status and prospects of genetic diagnostics and cloning of animals. Examples for subjects of projects in the field of resources and energy are fuel cell technology, nuclear fusion and geothermal energy.

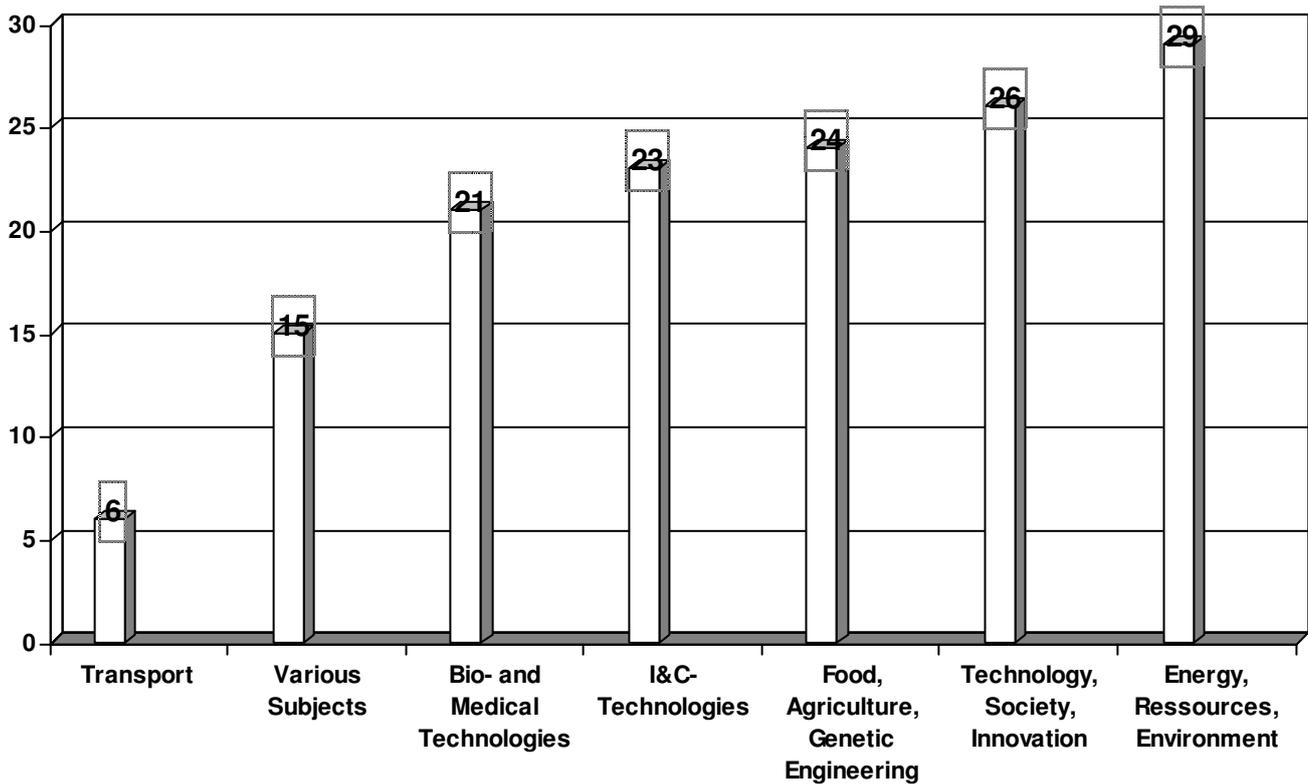


Figure 7.2. Thematic Focus of TAB-Studies (1991 - 2009)

Selected recent and ongoing projects

- > Hazards and vulnerability in modern societies – the case of a large-scale outage in the electricity supply
- > Pharmacological and technical interventions for improving performance: perspectives of a more widespread use in medicine and daily life (»enhancement«)
- > Renewable energy sources to secure the base load in electricity supply – contribution, perspectives, investments
- > International competitiveness of the European economy with regard to the EU state aid policy: the case of nano-electronics
- > Clinical research in Germany with special focus on non-commercial studies
- > Regulations for access to the information society
- > Future potentials and strategies of traditional industries in Germany – impacts on competitiveness and employment
- > How can research contribute to solving the problem of world food supply?

7.3.3 Reports, publications, information

The results of the TA projects and other TAB work are documented and made available as TAB working reports and background and discussion papers. Final reports are usually issued as printed papers of the German Parliament (“Bundestagsdrucksache”). Since 1996, selected final reports on TA projects have appeared in the book series “Studies by the Office of Technology Assessment at German Parliament”, published by edition sigma, Berlin.

TAB and information on current activities and published reports are also accessible on the internet (www.tab-beim-bundestag.de/en/index.html) and on the German Parliament intranet. The “TAB letter” generally appears twice a year, and primarily contains information on the TAB work programme and reports on the findings of TAB projects and monitoring activities (www.tab-beim-bundestag.de/en/publications/tab-brief/index.html).

The fact that all major reports are made official printed matter of the parliament implies that the reports are introduced into the formal deliberations of the parliament according to the official rules of procedure of the parliament. The publication of TAB reports as printed matter of parliament is connected with a preface of the document written by the Research Committee and the council of elders deciding on which committees apart from the steering committee (normally the Research Committee) are asked for an opinion on the document. These committees have to put the report on their agenda and have to report back to the steering committee before the document is finally set on the agenda of the plenary together with a recommendation for conclusion by the steering committee. In the interview, the chairwoman of the steering committee put it this way: *“Almost all TA-reports are inducted to the consultations of parliament and its different bodies. This implies that expert parliamentarians in the relevant committees have to deal with the reports and the reports are not ‘only’ waiting for reception in libraries or on web pages. They show up on the agenda of the plenary and the committees and thus underline that the Bundestag is able to take decisions on the basis of best available knowledge”*.

The treatment of a report can be rather formal in the sense that the committees only report back that they have taken notice of the report and that the parties make formal statements in the plenary. In other cases committees make detailed statements and reports are debated in the plenary. Since TAB reports usually do not include recommendations for action and do not deal with issues that require immediate action but mainly deliver background knowledge on S&T issues, the conclusions of the parliament usually are of a modest nature, e.g. asking the government to take into consideration issues raised by TA projects in their work.

There are many other ways of communicating the TAB work in the parliament. Workshops and expert consultations organised in the course of the project work offer Members of Parliament an opportunity to

learn about the state of the project, benefit from expert statements and hear about different perspectives on the issue from various stakeholders. Moreover, TAB is invited by interested committees to present interim results. Also parliamentary groups invite TAB staffers to meetings of special working groups that they have set up. Apart from the rapporteurs for TA nominated by the steering committee for TA the committees who submitted a proposal for a TAB study can also nominate parliamentary rapporteurs for projects. The rapporteurs are duly continuously consulted and informed by the project team.

7.3.4 Utilization and resonance of TAB results

The effect of TAB's work and of TAB reports in the parliament is manifold but as stated by a TAB insider": *"there aren't any impacts like an earthquake"* it is not like *"here is a TAB report and here is a new bill based on this report"*. It is in line with the statement from interviews with the NGO representative and with a Member of Parliament, when a TAB staffer assumes that the most precious contribution of TAB to the consultations of the parliament lies in basing debates on facts and delivering non biased information – especially in controversial fields of technology development.

The benefit for parliamentarians is clearly stated in the interview with the chairwoman of the Research committee: *"If parliamentarians want to take decisions independently and to the best of their knowledge, they need normative orientation and a well-founded knowledge base. The studies of TAB contribute substantially in this respect. In my everyday work"*, she adds, *"I use results of TAB projects for speeches, for preparing myself for panel discussions and debates, but also as a source when preparing parliamentary motions and bills."*

Resonance of selected TAB projects and reports in the parliament

(More extended descriptions and more case studies in: Bundestag 2010)

The results of the TAB report on **"Possibilities for geothermal electricity generation in Germany"** (2003) were taken up by the Social Democrats and the Green party in the parliament to formulate a motion that was dealt with in parliament together with the new bill on renewable energy. Central elements of the TAB report regarding possible governmental support for geothermal electricity were taken up in that debate (Bundestag 2010, 26)

TAB was among the first organisations to start an assessment of the perspectives of **Nanotechnology** in Germany. A report published in 2003 covering a broad range of policy aspects (research funding, risk assessment, technological visions and public fears) was taken up by all parliamentary groups after its publication to start motions in the parliament on Nanotechnology. Many research projects and programmes started by the government in the following years clearly have been inspired by the recommendations for policy making provided in the TAB report, as was pointed out by several Members of Parliament in a debate on the state of the art of Nanotechnology in Germany in 2007 (Bundestag 2010, 27).

In 2003 TAB completed a report on **„Military use of space and possibilities for arms control in space"** that was the basis for a plenary debate on "space politics" in 2004. Several members of the parliament supported their arguments by referring to the TAB report, as e.g. a member of the Social Democrat party: "Weapons have no place in space. The TAB report makes clear how important it is to position oneself clearly in this regard." (Bundestag 2010, 28, own translation)

A TAB report on **"Public electronic petitions and civil participation"** that - as it were - dealt with the inner affairs of the parliament and its link to the citizens had a major effect in the federal and the state parliaments. TAB was invited to a meeting of the chairmen of petition committees of the federal and the state levels to present results. TAB also was invited to edit a special issue of the "Zeitschrift für Parlamentsfragen" on electronic petitioning. (Bundestag 2010, 30).

The TAB project on the “2nd and 3rd generation of green genetic engineering” was presented in a public committee meeting. Due to the great response to the report in parliament and outside the committee decided to organise an additional public expert meeting. The report’s rather sceptical assessments of the economic prospects of new green genetic engineering approaches was discussed controversially in parliament and among interest groups, but it was generally admitted - as the German Society of Biologists had put it in a statement - that “the report opened up an opportunity to come back to a sober and factual discussion on the potentials for application and on security aspects of green biotech” (Bundestag 2010, 33, own translation). The third report of the federal government on experience with the German law on genetic engineering quoted extensively from the recommendations given in the TAB report and highly appreciated the comprehensive picture given by the TAB report which was stated to provide a perfect basis for the discussion on possible fields of research and applications.

TAB does not have a strong mission to stimulate public debate and thus the public profile of TAB has been rather low. Nevertheless TAB reports always have been public and parts of the reports have been regularly published since 1996 in a book series. TAB reports always have been ordered and used by related expert communities but also by students or teachers and TAB staffers are frequently invited to scientific conferences or meetings as well as to university courses and public debates organised by CSOs to talk about TAB’s work and results of particular reports. An example of how important TAB reports can be as a reference for civil society organisations is given in the interview with a representative of a German environmental NGO. TAB reports here are assessed to be the only “*non-biased source*” of information in the hotly debated field of Biotechnology and genetic engineering and TAB work is regarded as being helpful to “*raise awareness for critical issues*” and help to “*raise the level of debates*”.

It is only recently that the parliament has seen the need to do more about making the work done on behalf of the parliament by TAB more visible in the general public and thus has more frequently organised public presentations of TAB reports in the parliament. The response to TAB activities in the evaluation report of the parliament is rated as “pleasant” given the low profile of TAB’s public relations activities (Bundestag 2010, 40).

7.4 Success factors

What is success? From her longstanding experience of cooperation with TAB the chairwoman of the Research Committee concludes: “*How to measure success or failure of cooperation between science and politics? There were and there are TAB reports of highest scientific quality for which impacts in the parliamentary proceedings are – for whatever reason – not identifiable. Are these examples for a failure of our cooperation? TAB’s mission is to provide technically and scientifically well-grounded and politically relevant analysis. TAB cannot be held responsible for whether and how parliamentarians or parliamentary bodies make use of it.*”

7.4.1 Serving the needs of parliament

The well configured process of setting up projects, exploring the public debate and fine tuning reports according to the needs of the client in a close setting of communication over the years has helped to establish trust in the working procedures as well as in the results of the TA unit’s work. This is regarded as one of the greatest achievements in the interview with TAB staffers and is supported by the interview with the MP. An advantage of the TAB model is the clearly client-related way of working. As the studies are initiated by members of parliament it is always certain that there is an addressee waiting to see the results. However there is not much room for experimenting with new methods. But the continuity and the clear and familiar procedures that have been established can be regarded as being a strength of the model, because – as a TAB

staffer put it in the interview: “...we know that the methods we have been using now for quite a long time are working, that we can make a connection to the discussions and procedures at the Bundestag, we have an addressee, we have a formalized way of introducing our findings into the discussion of the Bundestag.” It is part of this longstanding experience that TAB has also established skills in working on a scientifically sound basis but at the same time has an eye on political relevance and also presents things in a way that they can be taken up by parliamentarians. TAB is, says the expert in the interview, a good “*translator*” in preparing scientific data and insights in a way that they can be “*understood and have some chance of reception*” and that they “*meet the needs and expectations of parliamentarians*”.

7.4.2 The Consensus principle

On the political side it has been proven to be a decisive element of the construction that the group of parliamentary rapporteurs committed themselves to take decisions based on the consensus principle and not on the majority principle. The consensus principle may lead to the avoidance of really hot contentious topics but it helps a lot on the one hand to provide for political independence of the scientific body, as the rapporteurs control each other mutually in their interaction with the scientific unit, and on the other hand to ensure that the projects adopted are supported by all parliamentary groups. In the Bundestag’s 2010 evaluation report it is stated: “*The consensus principle may be regarded an unusual element in the parliamentary system. For a policy advice function broadly accepted and supported by all parliamentary fractions trans-fractional control of TA is essential and should be retained at all costs*”. (Bundestag 2010, 14, own translation). A TAB staffer says the consensus principle in the group of rapporteurs helps that “*conflicts are dealt with in a reasonable way*”. An example of the salient importance and the practical functioning of the principle is given in the case study.

7.4.3 The right “distance”

What is unanimously regarded in the interviews to be decisive for the success of TAB is the balance between scientific independence and close relationships to politics established by the TAB model. The Bundestag report from 2010 underlines that the organisational mode of close cooperation with a high quality research organisation still should be regarded as the appropriate model after 20 years of cooperation: “*The institutional and procedural design of close cooperation between science and politics gave way to joint communication and learning processes, which ultimately allowed for a successful establishment of TA at the German Parliament.*” (Bundestag 2010, 11f., own translation) . “*TAB is*”, says the interviewed expert, “*not too close to and not too far away from politics*”.

7.4.4 Continuity and Trust

After more than twenty years of existence the fact that TAB sticks to a more traditional concept of policy advice is regarded as being a part of its success. “*You would not see TAB doing a “technology theatre play in the next 10 or 15 years*” says a TAB staffer, “*... we are much more conservative. Whether that is a strength or a weakness, I don’t know. It’s both. It is a strength because we know that the methods we have been using now for quite a long time are working, so that we can make a connection to the discussions and procedures at the Bundestag.*” The science journalist puts it this way: “*TAB serves the needs and has found the language of politics and by longstanding experience thus has established trust and acceptance*”. He speaks of the “*innate neutrality of TAB reports*” whereas with other sources he always has a feeling of “*innate self-interest*”.

7.4.5 Being a neutral source of information

TAB's neutrality appears to make TAB reports a good source to refer to in debates on contested issues. *"They are kind of neutral in the political scene, to refer to TAB is uncomplicated and it has good reputation in Germany"*, says a representative of an environmental NGO in the interview. Neutrality, however, often might be a barrier with regard to TAB's access to the media; the media prefer explicit political positions to balanced argumentation (NGO interview). TAB reports are appreciated because they guarantee a comprehensive and at the same time non-biased analysis of an S&T policy issue. When reading up on an issue *"I start from many sources"* a science journalist says in the interview, *"but when it comes to exploring the scientific background of political debates or conflicts, I usually go to them (TAB)"*.

7.4.6 Going public – but carefully

"We have an addressee; we have a formalized means of introducing our findings into the discussions of the Bundestag", but in the context of organisational model of TAB innovation *"needs time"*, a staffer says. And the felt need for innovation that has apparently accompanied TAB's development over time is for a more active and participatory relationship with the general public. The relationship to the general public that was part of the mission statement from the start of TAB, has only slowly been translated into an established practice of organising more public events. *"Step by step"* it has been accepted says a staffer, *"that TAB not only should advise parliament but can also perform activities which are more public and visible."* This appears to be a process that probably is still not finished but may play a role in the future development of the institution. In the expert interview, the dissemination of results beyond the parliament is addressed as being a weakness, TAB should do more to reach out to wider society, since the reports are worth being read not only by policy makers. The interviewed journalist also notes *"they do not do public relations. That is their drawback"* and he would like to see an extension of TAB's mission of doing *"translational work"* not only from science to politics but also to citizens. On the other hand it is not necessarily regarded as a weakness that TAB does not intervene directly in public debates. From the perspective of the interviewed NGO representative it is a reasonable part of TAB's profile to maintain a distant and neutral position which implies, that *"... they are more independent from the public or lobby pressure"*.

7.4.7 If you want to set up a Parliamentary TA institution...

The success criteria for TAB and parliamentary TA in general are summarized by the chairwoman of the research committee as follows: *"A parliamentary TA institution will work, as far as it is able to take up the concrete information needs of parliament: PTA must have a clear mandate and mission, and it must be ensured that the issues relevant for parliament are addressed. These issues must be scientifically explored as well as presented in a way that meets the addressees' needs and there must be mechanisms in place to feed results into the practical opinion forming and decision making processes of parliamentarians. What must be guaranteed in the first place are continuity and regularity with respect to structures, personal and procedures. Successful institutionalisation needs time, in order to enable those involved to learn and to jointly develop a practice of TA that is appropriate for the given context."*

7.5 Case Study: Large-scale outage in the electricity supply

- an example of hazards and vulnerability in modern societies.⁴⁹

The case study in this section is meant to exemplify the more general description of TAB's working methods given in the previous chapters – from selecting topics and scoping to the dissemination of findings. The project on large scale outage of electricity supply was selected because it has recently been completed and it includes the organisation of a public event in the parliament – the latter being a relatively new element of TAB's work.

In 2008 the Office of Technology Assessment at the German Bundestag (TAB) was commissioned by the Committee on Education, Research, and Technology Assessment to analyze the consequences of a prolonged and widespread power outage. The study was to explore the possibilities and the limitations of the national system of disaster management to cope with such a large-scale emergency. The commissioning of the study was motivated by the notion that electrically powered equipment has almost completely penetrated the living and working environment, and that thus the consequences of a prolonged and widespread power outage would amount to a particularly serious hazardous situation. A power outage was thought to affect each component of society's critical infrastructure, so that it would be nearly impossible to prevent a collapse of all of society. A particularly critical aspect was that social awareness of these risks was still in its infancy despite the potential impact of these dangers and disasters.

Project Info:	
Decision on the project design in the Research Committee:	June 2008
Start of project work:	October 2008
Completion of the Final Report:	December 2010
Approval of Final Report and publication as official parliamentary document:	April 2011
Public expert debate on the findings in parliament:	Mai 2011
Budget for external expertise:	160.000 €

7.5.1 Initialisation and commissioning of the study

The project was initiated by a group of parliamentarians from the German parliament's standing Committee of Internal Affairs. Actually it was a group of four parliamentarians each representing one of the parliamentary groups. The initializing group of MPs had been actively engaged in discussions with the so called *Forschungsforum Katastrophenschutz* (Research Forum Civil Protection), a platform for continuous exchange on civil protection organised by a group of experts from science and administration. Point of departure of asking for a TAB study was the *Grünbuch Katastrophenschutz* (Greenbook on Civil Protection) that was initiated by the Committee of Internal Affairs. This report discusses several disaster scenarios and the disaster management schemes, infrastructures and means to deal with these by public authorities. A deficit or requirement identified in this document as well as by the discussion on civil protection in Germany in general was that no reflection of the catastrophic effects of a complete outage in the electricity supply was available. The MPs involved had an interest in filling this gap and in putting the issue of a large scale

⁴⁹ This case study is mainly based on an interview with the responsible project manager and deputy director of TAB, Dr. Thomas Petermann. The full report of the TAB study (in German) as well as an extended English summary is available for download at TAB's webpage (<http://www.tab-beim-bundestag.de/en/publications/reports/ab141.html>).

electricity outage on the agenda of governmental bodies and civil protection and disaster management authorities. The Committee of Internal Affairs unanimously decided to ask the steering committee for TA, the Committee for Research, Education and TA, to set up a TA study on the subject. In June 2008 the Committee for Research, Education and TA officially authorized the Office of Technology Assessment at the German Parliament (TAB) to design a study on the effects of a large scale electricity outage in Germany.

7.5.2 Setting up of a pre-study

Following a first scanning of available documents, consultation with experts and a discussion with the initiating group of MPs from the Committee of Internal Affairs, the TAB suggested starting the TA process with a pre-study. This horizon scanning effort was felt to be necessary due to the complex division of tasks between the federal and state governments, the broad range of public authorities (federal, state, county, municipalities) that had to be taken into account and the broad range of infrastructures (80% of them owned by private companies) that had to be considered (electricity, telecommunication, water supply ...). Moreover, the availability of data (in particular from private companies) had to be clarified. The pre-study was also to help clarify the scope of the project and to select from the landscape of social and economic areas that most probably would be affected by an outage those areas that should be in the focus of the project. To that end apart from desktop research and contacts with experts and stakeholders organised by the TAB project team in Berlin, an overview study was commissioned to the private research company PROGNOS. This study provided a first sketch of the wide range of areas that would be affected by an outage and provided a first overview on possible impacts, critical infrastructures and existing disaster management plans via expert interviews. The project work also benefitted from an ongoing study on the effects of an electricity outage commissioned by the federal state government of Baden-Württemberg. TAB was easily able to establish contacts with the responsible researchers since this study was led by a group of experts from the Karlsruhe Institute of Technology (KIT) – the home of the Institute of Technology Assessment and Systems Analysis (ITAS) which is running TAB on behalf of the parliament.

During the pre-phase, the TAB project team (five researchers with backgrounds in political science, sociology, engineering and physics) consulted and established contacts with a large set of institutions relevant for the issue: Experts from the *Bundesamt für Bevölkerungsschutz und Katastrophenhilfe*, BBK (Public Authority for Civil Protection and disaster relief), the *Bundesamt für Sicherheit in der Informationstechnik*, BSI (Federal Office for Information Security), *Gruppe Zivile und Militärische Zusammenarbeit* (Joint group of reservists from the German armed forces and civil protection organisations, such as the Red Cross and others), the Ministry of Internal Affairs, as well as relevant private actors such as water supply companies, energy supply companies and German Telecom. Close cooperation with BSI helped to access information on disaster management in the field of telecommunication, which was not supplied by the German Telecom company. In this and in other cases access to detailed information about disaster management provisions was denied due to company secrecy. In order to avoid any suspicion on the part of security and disaster management authorities that the aim of the TAB project was a kind of clandestine evaluation of their performance, establishing good contacts with these organisations was regarded as being of primary importance.

The set of explorative and horizon scanning activities and consultations helped to get an impression of what the most relevant issues were, and confirmed that so far no pertinent study (apart from the at that time ongoing study in Baden-Württemberg mentioned above) was available.

7.5.3 Set up and scope of the main study

The final decision on the selection of focal areas for the main study taken after consultation of the spokesman of the initialising group of MPs was guided by the rationale to cover those areas that could be regarded as most critical, i.e. as being of utmost importance for life and well-being of the population. It was decided unanimously not to focus on nuclear energy plants and their criticality in case of an electricity outage, since it was felt that in the given political situation in Germany this would have inevitably attracted attention to the question of the consequences of phasing out nuclear energy (a particularly hot political issue in Germany) and on the issue of effects of malfunction of nuclear power plants and thus would marginalise the study's central but more general issue of a large scale outage of energy supply. It also was expected to be almost impossible to obtain reliable data on the disaster management schemes of nuclear energy plants.

It was decided to choose as the core of the project (main study) the analysis of impacts in selected sectors of critical infrastructures and to exclude any in depth reflection on and assessment of probable *causes* of a electricity outage (be it terrorist attacks or natural disasters). The basic assumption was that the ever more complex and interwoven supply system as well as its dependency on IT would increase the general risk of a black out.

The selected impact areas of the main study were:

- Information technology and telecommunication
- Transportation and traffic
- Water supply and sewage disposal
- Food supply
- Health care system
- Financial services
- "Prisons" as a special case and subject of an own study.

The study discussed the following issues as critical and core aspects of disaster management:

- Integrated and cross-organisational disaster management
- Interlinked disaster management without net infrastructures
- Crisis communication without electricity
- Fuel supply and providing for a robust emergency power supply
- Insular power supply networks as a means to increase resilience of power supply after a large scale outage
- Information of and awareness building among the population

The in house research by the interdisciplinary TAB project team was supported by three studies commissioned to external experts:

- Literature study on factors and options of disaster management
- Study on the psychological aspects of risk perception and risk communication as factors to cope with a large scale electricity outage

- A third study was commissioned to an engineering consortium active in the field of security services for private and public customers. The mission of this study was to explore the core areas via expert and stakeholder interviews with the aim of generating knowledge on the vulnerability of the areas and of identifying features critical for civil protection.

During the main phase three extended project team meetings involving the contractors and other invited experts were held to discuss interim results and guide the further course of explorations.

7.5.4 Fine tuning the final report

First results and conclusions (the draft final report) were discussed at a project workshop attended by the project team and the contractors as well as the spokesman of the group of MPs that had initialised the study, colleagues from the Baden-Württemberg study mentioned above, representatives of the public authority for civil protection and disaster relief (BBK) and the Federal Office for Security of Information (BSI). The objective of the workshop was to come to a conclusion on reliable and robust insights with regard to impacts, options for disaster management and precaution as well as on general political recommendations.

Federal elections took place just before the completion of the final report and caused slight problems for the project management, leading to some delay in the delivery of the report to its addressees in the parliament. While the main contact person in the Committee of internal affairs was re-elected some of the interested MPs from the Committee of internal affairs were not returned.

The TAB published a summary of the report in the December 2010 issue of its newsletter “TAB-Brief”. The TAB-Brief is distributed to all members of parliament and to around 400 other subscribers in ministries, public authorities, research organisation and civil society groups.

The draft of the final report underwent several rounds of review among the team members and involved experts. In addition results were discussed with representatives of the Ministry of Interior affairs, in particular with representatives of the departments for water supply and telecommunication. The report was also sent to representatives of relevant public authorities. The results of the report were presented by the project manager from TAB together with one of the authors of the commissioned expertise in an expert meeting at the Authority for Security in Information Technologies (BSI).

The completion of the final report and its delivery to the rapporteurs for TA of the Committee for Research, Education and TA coincided with the Tsunami and the Fukushima nuclear disaster in Japan. The report – although not yet approved by the committee and thus not available to the public – found its way into the media (reports among others in the leading German daily newspaper *Frankfurter Allgemeine Zeitung* and in the online journal of the leading political magazine *Der Spiegel*).

Although the report did not deal explicitly with nuclear energy and did not debate in detail the question of probable causes of an electricity outage, one strand of media reporting employed the report to support warnings against a rapid phase out of nuclear energy in Germany, that was on the agenda after Fukushima and later in the year was decided by the Federal Government.

A second strand of media reporting used the report to support the notion that a decentralised energy supply based mainly on renewables would help to deal with the impacts and the rebuilding of supply after an electricity blackout.

7.5.5 Discussion of draft report with parliamentary rapporteurs for TA

As is usual in TAB procedure, the first readers of the report were the rapporteurs for TA. The rapporteurs unanimously endorsed the report in general. As the consensus on a nuclear phase out after Fukushima was broad, media reports on using the report as a warning against a quick phase out did not draw much reaction. However, the second strand of media coverage found some response in the group of rapporteurs. One rapporteur put forward the opinion that the positive role of renewables as a means to prevent and manage the consequences of a power supply outage (insular supply networks) should be made more prominent in the report and the report should in this respect draw conclusions with regard to an ongoing revision of the German law on energy supply and the support of renewables. This was strongly rejected by another member of the rapporteur group, so that an extra meeting of the group chaired by the chairwoman of the Research Committee had to be organised. As a result of that meeting, it was possible to avoid substantial revision of content and to achieve consensual approval by the rapporteurs due to suggestions for a slight rewording of “critical sentences” suggested by the TAB team. The rapporteurs supported the formal approval of the report by the committee but with a view to the public resonance that was triggered by the media the rapporteurs recommended the organisation of a joint meeting of the Research Committee as the steering committee for TA and the Committee of Internal Affairs which should be open to the public and to which a selection of stakeholders should be invited.

7.5.6 Public Committee meeting and public discussion of the results of the study

This event took place in the meeting room of the Research Committee on 25th May 2011 (3 – 5.30 p.m) and was broadcasted on the Parliamentary TV channel. Around 90 persons (apart from the members of the both committees involved) registered as participants for the meeting. Among them were 10 members of parliament (and/or their assistants), the media, representatives of major energy suppliers in Germany (RWE, e-on, EnBW), private companies active in security management and research, IBM, public authorities (Water management, BBK, BSI, Federal Authority for the Environment), Federal Ministry for Transport, Federal Ministry for Economy, Federal Police), as well as disaster management organisations (German Red Cross and others).

The meeting was chaired by the chairwomen of the Research Committee. The member of the Committee for Internal Affairs who initiated the study gave a brief introduction to the agenda and the salience of the report prepared by TAB. The study was presented in more detail by the director of TAB and the responsible project manager followed by a round of statements and comments by invited experts: the president of the *Bundesamt für Bevölkerungsschutz u. Katastrophenhilfe* (BBK), the head of the department for disaster provision and critical infrastructures of BBK, the head of the department “governmental networks” of the *Bundesamt für Sicherheit in der Informationstechnik* (BSI) and a well-known German researcher on disaster management.

This round of expert statements was followed by statements of representatives of the 5 parliamentary groups present in the Bundestag, before the floor was opened for roughly one hour of discussion and questions from the public and the media.

Of the broad range of policy options that had been covered by the report concerning the many separate fields of disaster management the following triggered the most reactions and comments:

There was a more general discussion on the need for amendment of legislation with regard to re-organising dispersed competences for different levels of disaster management in Germany. The TAB report highlighted

the fact that the task of well-coordinated emergency and crisis management is – apart from the stratified governmental responsibilities due to the federal system – made even more complex by the need to include the relevant non-governmental actors. These include many enterprises in addition to the energy supply companies, such as those in the sectors of information and communications, food, and security. The number and heterogeneity of these companies makes these tasks significantly more complicated (There are e.g. 5200 providers and 5900 disposal companies in the water sector and 3000 service providers in the information technology and telecommunications sector. They partly operate locally and partly in more than one region, and the competence and capacity of each with regard to crisis management vary extremely). The number and heterogeneity of the potential security partners of the authorities led to the assumption that there is a need for further optimization of the selection of public-private security partnerships at the regional and state levels and of their integration into the disaster prevention and response efforts.

Another issue that was identified as being of relevance was the question of organising the cascade of measures starting from the announcement of the state of emergency to the implementation of related directives and to taking urgent actions by federal, state and local authorities.

The recommendations for research contained in the report were assigned high priority: research on the probable reactions of the population and the consequences for disaster management and communication and the need to fill the information gaps identified in the report, in particular data and knowledge about the vulnerability of critical infrastructures. With regard to the latter the problem of missing information from private companies (water, telecom) was recognised as a serious barrier requiring urgent attention.

Another aspect elaborated on in the report that attracted the special attention of experts and policy makers was the so far unsolved problem of how to organise crisis communication when communication infrastructures are not working.

The event helped significantly to create awareness of the TA report in the government. The Ministry of Internal Affairs distributed the report to a large range of public authorities involved in disaster management.

7.5.7 Further dissemination activities and general assessment of impact

The BSI organised a workshop with a presentation of the report by TAB on public private security partnership in the telecom area. In October 2011 the working group on security research of the German Academy of Engineering organised a presentation of the TAB study.

With respect to the impact it can be said that the original intention of the Committee of Internal Affairs to put the consequences of a black out on the agenda of public authorities and private companies was clearly supported by the TA project and the final report. The report helped to raise awareness of the over-complexity of responsibilities in disaster management and the need for coordination of these competences including private companies owning critical infrastructures (telecom).

The report is now about to be introduced into the normal process of parliamentary consultations with selected committees being asked for comments on the report. As outlined in the general description of TAB's working procedures, this includes the publication of the report as a printed matter of Parliament (Bundestag 2011, Drucksache 17-35375) and the selection of committees (besides the Research Committee and the Committee of Internal Affairs) that are asked for a statement on the report. These will be followed up by the

steering committee and then the report with a recommendation of the steering committee will be put on the agenda of the plenary.

7.6 Future Challenges for TAB

The overall design of the TA function at the German Bundestag did not change substantially over TABs more than 20 years of existence. The actual working procedures have been developed and fine-tuned over time and now can be regarded as being well established routines.

Despite the close institutional link between TAB and the work of parliamentary committees it must nevertheless be regarded to be a constant challenge to connect the TA work with the demands of parliamentarians and design studies in a way that they are useful for the work of parliamentary committees. Direct communication with the client here is decisive, but always is in conflict with the tight time schedule of MPs.

It can be said that with the inclusion of the Fraunhofer-ISI as a partner of KIT the model has been slightly changed in order to adopt it to a growing need for studies on innovation policy that was observed at the beginning of 2000. Such institutional adaptations might be useful also in the future with regard to other upcoming issues in S&T policy making. Here it will be decisive to keep the established good routines working but at the same time being flexible with regard to changes in the institutional environment.

The relation of the TA function in the parliament to the general public has been a major point of discussion and even conflict when TAB was established in 1990. The chosen organisational model only allowed for a relatively weak public role of TAB. In recent years some careful steps had been taken to strengthen the visibility of TAB's work in the public, e.g. by organising public events to discuss findings of TAB studies. These activities might be extended in the future. In this respect the challenge will be to expand TAB's public role and visibility without damaging its strength as a honest and independent knowledge broker accepted as a reliable and neutral source of information by all parliamentary groups.

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Chapter 8 Parliamentary TA in The Netherlands

Jurgen Ganzevles, Ingrid Geesink, Rinie van Est, Geert Munnichs (all Rathenau Instituut), Ventseslav Kozarev and Zoya Damianova (both ARC Fund)

This chapter describes the way the Dutch Rathenau Instituut is institutionalised. Furthermore, the practicalities of parliamentary Technology Assessment at the institute are discussed, clarified by a case study on Global Trade in Human Biological Material. The chapter ends with some prospects for the future.

8.1 The institutionalisation of the Rathenau Instituut

In 2011, the Rathenau Instituut celebrated its 25th anniversary. This section describes relevant developments in the history of the Rathenau Instituut and its current institutionalisation.

8.1.1 Institutionalisation of parliamentary TA in the eighties

The early history of the Rathenau Instituut is a nuanced one.⁵⁰ More than ten years passed since the first parliamentary motion on Technology Assessment in 1975, which was rejected, and the establishment of the NOTA (Netherlands Organization for Technology Assessment) – the predecessor of the Rathenau Instituut – in 1986. In these ten years, the government pushed technological innovation forward, because of its supposed contribution to economic growth. This is highly relevant because of the economic recession that the Netherlands was facing in the late 1970s and early 1980s. Technology policy became a separate policy area, marked by the 1979 *White Paper on Innovation*.⁵¹

At the same time, concerns grew about the undesirable effects of science and technology, such as pollution, safety risks and ethical issues. The *White Paper on Innovation* already briefly mentioned the relevance of studying the social aspects of new technologies. Citizens, government, politicians, NGOs and scientists tried to find ways for dealing with the promises and downsides of nuclear energy, recombinant DNA and microelectronics. People were facing new dilemmas, controversies and uncertainties, which led to new coalitions, experiments and institutions. Examples of such novelties were the “Broad Societal Debate” on energy generation (1982-1984), organised by the government, and the *Science and Society* movements at universities. The formalisation of parliamentary Technology Assessment as a support mechanism for decision making on technology is one of the outcomes of this reshuffle in Dutch society.

The need for reflecting on technological developments was widely accepted, but this did not automatically lead to an institutionalised form of TA. The surplus value was not obvious. Some accused technology assessment of being pro-technology, while others found it just the opposite: anti-technology. Furthermore, there was a fear of extra bureaucracy, slowing down decision making. It took debate, negotiations and unforeseen events for formal TA to take off.

⁵⁰ For a more detailed description, see: ‘The Netherlands: Technology Assessment from Academically Oriented Analyses to Support of Public Debate’ by J. van Eijndhoven, in: *Parliaments and Technology. The Development of Technology Assessment in Europe*. Vig, N. and Paschen, H. (eds.). Albany: State University of New York Press (2000), and *Technology Assessment. Waakhond of speurhond?* PhD thesis, Free University of Amsterdam (1991) by R. Smits and J. Leyten.

⁵¹ Tweede Kamer, 1979-1980, 15855, no. 1-2. *Innovatie: het overheidsbeleid inzake technologische vernieuwing in de Nederlandse samenleving*.

In the early years, the initiative for institutionalising TA was with the parliament. Member of Parliament Terlouw (D66, progressive liberals) considered the American Office of Technology Assessment (OTA) to be an example. In 1975, he proposed to install such an institute in the Netherlands, closely linked to parliament. But in the political climate at that time, technological development and its societal effects were still considered to be of lesser importance. Mainly for this reason, his motion was rejected.

A few years later, three Christian Democrat parliamentarians pleaded for ethics rules on scientific practices. Amongst other things, such rules required the arrangement of registration, supervision and accountability of research. However, the Advisory Council for Science Policy (RAWB) advised against this.⁵² For juridical and practical reasons, such a legal framework was not desirable and moreover, it was unable to meet the expectations. Interestingly, the council did see opportunities for using controversies as a social mechanism for better policymaking, without making explicit reference to practices of Technology Assessment.

In the 1980s, the initiative for Technology Assessment came to lie with the government. Plans for institutionalising TA became specific in 1984, with the *White Paper on the Integration of Science and Technology in Society*.⁵³ This white paper benefitted from an earlier study (1980) by advisory group Rathenau (named after its chairman), who had studied the Societal Effects of Micro-electronics.⁵⁴ One of Rathenau's recommendations had been to perform Technology Assessment on a more regular basis. Furthermore, the later "Broad DNA Committee" (1983) pleaded for a permanent committee with the broad task of signalling undesirable societal effects. In the 1984 white paper, the government proposed to house TA activities within the Ministry of Education and Science.

Parliamentarians, however, stressed the importance of an independent TA institution 'at arm's length' from the government. Possibilities for attaching it to either the government or parliament were discussed. The Christian Democrats wanted the TA organisation to be independent from both government and parliament. The Christian Democrat Minister of Education and Science proposed this option with a successful outcome. An office of a maximum of five persons, called the NOTA Bureau, was set up under the Royal Academy of Arts and Sciences. A NOTA Board was set up to supervise the daily tasks of the bureau.

8.1.2 From research TA to interactive TA in the nineties

The initiation of a TA programme, typically carried out by university researchers, was the first task NOTA took up in 1986. This TA programme was to contribute to "the systematic identification, analysis and evaluation directed at decision making, of the consequences of the introduction and use of science and technology".^{55,56} Upcoming techno-scientific developments would be described and assessed on their (potential) effects on society. Scientific research reports were the typical output. This process was to be managed by people from NOTA.

The American OTA served as an important example regarding the TA approach that was to be followed. However, compared to the OTA, the target group in the Netherlands was more diffuse. The OTA was strongly attached to Congress, while the NOTA was to advise the Minister of Education and Science at first. Dutch politicians were addressed only at second instance, when the minister discussed the yearly working

⁵² Raad van Advies voor het Wetenschapsbeleid: 'Maatschappelijke beoordeling van wetenschappelijk onderzoek.' Den Haag: Staatsuitgeverij (1981).

⁵³ Tweede Kamer, 1979-1980, 15855, no. 1-2. *Innovatie: het overheidsbeleid inzake technologische vernieuwing in de Nederlandse samenleving*.

⁵⁴ 'Maatschappelijke gevolgen van de micro-elektronica', Adviesgroep Rathenau (1980), Den Haag: Staatsuitgeverij.

⁵⁵ NOTA Werkprogramma, Den Haag, September 1987.

⁵⁶ *The Rathenau Institute and the Debate, Annual Report*, The Hague

programme in parliament. Furthermore, as a secondary mission, NOTA was to provide for a ‘societal address’. It was to react on signals about the integration of science and technology in society, generated by parliament and the ministries. It was also to provide access to signals from society. However, these tasks proved difficult to specify and take up in practice.

In 1990, the staff and board of NOTA decided to reconsider its addressee in order to clarify the role of the organisation, which was unclear to many outsiders. First and foremost, its work became to address parliament, even though the NOTA Bureau had acted at a distance from politics. From then on, TA studies were followed by reports to parliament that highlighted politically relevant issues. As a consequence, the timing and readability of the bureau’s output became more important. Through contributions to the societal debate, the visibility of the organisation was improved.

The 1992 evaluation committee encouraged NOTA to step away from academic research further, and to get closer to public debate and policymaking. The mission became “to contribute to the societal debate and political opinion forming on issues that are the result of, or are connected with, scientific and technological developments, including the ethical aspects of these developments”⁵⁷ Research became secondary, only to serve the central mission. Along with this shift in orientation, the name of the organisation was changed to Rathenau Instituut.

Against the background of the mission change, a lively political debate was going on. Ethical issues related to the development of science and technology made it to the parliamentary agenda. A Framework for Debate on Ethical Aspects of Scientific Research was proposed by the Minister for Science and Education in 1991, which built forth on the political debate of the late 1970s.⁵⁸ The organisation of public debates on the ethical aspects of science and technology was part of this framework. For a period of three years, a “Platform on Science and Ethics” was set up with a leading role for NOTA, which would be supported by a number of advisory organisations.

For NOTA and later on the Rathenau Instituut, these developments opened a window of opportunity to experiment with ways to involve the broader public. Citizen participation methods were employed in 1993 for the topic of the genetic modification of animals, based on the Danish method of consensus conferences. Later projects like Clones and Cloning (1998-1999), Replacement Medicine (2000-2001), Meeting of Minds (2005) and the contribution to the World Wide Views on Global Warming (2009) show that public participation became a regular element of the Rathenau Instituut’s way of performing TA, although it never became the central pillar of the institute.

Next to making use of citizen participation activities, the Rathenau Instituut decided to explore methods for stronger interaction with powerful actors in industry, government and politics. Citizen and stakeholder participation gives a voice to those who are affected by, but not in the position to steer the development path of new technology. At the same time, the shortcomings of this method became apparent. Clarifying citizens’ and stakeholders’ visions in a discursive setup, like a consensus conference, proved not powerful enough in itself to change decision-making processes in politics and society. Such an impact would require more interaction with high-level decision makers.

⁵⁷ OWB/FO-93070908, *Instellingsbeschikking Nederlandse Organisatie voor Technologisch Aspectenonderzoek*, 19 April 1994, published in Uitleg, May 25, 1994, pp. 44-46.

⁵⁸ Tweede Kamer 1990 – 1991, 21 319, no. 12.

Under the header of *Interactive TA*, a number of projects were carried out for the purpose of attaining more decision-making power.⁵⁹ An important example is the GIDEON project in 1995 on crop protection, which linked perspectives from agriculturists, doctors and consumers to those of policymakers and technologists. A later example is a project on sustainable water management (2001).

8.1.3 1999-2004: from interactive to communicative TA

In 1999, the evaluation committee concluded that the Rathenau Instituut had initiated but not yet completed transforming itself so as to be more relevant to politics and society. The institute was in the process of changing itself from mainly an institution aimed at producing reports, to an institute aimed at promoting “societal debate” and “the formation of political opinion”. The committee also stressed the importance of improving the institute’s knowledge base by taking senior guest researchers on board temporarily. The committee considered the institute too small for having an in-house research function.

It became a priority at the institute to strengthen communication activities, as a means to involve both politics and public. Along with the entry of director Jan Staman in 2002, it was decided to establish a separate communication department, which was realised in 2004. Communication officers came to work together with the project managers in each phase of the project. In this same period, there was a lively discussion about the impact of TA activities amongst TA practitioners in Europe. Amongst other things, this was addressed by the TAMI project (Technology Assessment – Methods and Impacts). In this project, the importance of communication became embedded in a shared definition of TA (2004): “*Technology assessment (TA) is a scientific, interactive and communicative process which aims to contribute to the formation of public and political opinion on societal aspects of science and technology.*”⁶⁰

In order to further improve the visibility to the outside world, a reorganisation of the institute took place in 2003. More focused projects, with a clearer start, a clearer ending and clearer target groups, became the institute’s engine. Furthermore, an extra management layer was introduced to which the director could delegate some of his tasks, thereby enabling him to take up the role of figurehead in national and international forums.

8.1.4 2004: establishing a Science System Assessment department

Not only managerial decisions, but also external factors changed the institute’s organisation. In 2004, the Ministry of Science appointed the Rathenau Instituut an additional research task: Science System Assessment. According to the minister, information on the functioning of the Dutch research system was fragmented and inadequately systematic. Consequently, important questions were left unanswered. Science System Assessment was to lead to an integrative picture, with improved accessibility of information, providing a better insight into science policy.⁶¹

Science System Assessment (SciSA) addresses the following questions: how is science organised, how does it function and how does it respond to developments in politics, the economy, society and science itself? The science system is studied on the level of institutional arrangements (financing, programming, evaluation), the

⁵⁹ See *Technology Assessment through Interaction. A guide*. J. Grin, H. van de Graaf and R. Hoppe. The Hague: Rathenau Institute, working document 57, December 1997.

⁶⁰ Bütschi et al. (2004), ‘The Practice of TA: Science, Interaction and Communication’, in: *Bridges between Science, Society and Policy. Technology Assessment – Methods and Impacts*, M. Decker and M. Ladikas (Eds.), Berlin: Springer.

⁶¹ As described in Self Evaluation Rathenau Instituut 2000-2005.

dynamics of existing and upcoming science fields, the functioning of research groups, and career opportunities of individual researchers.

In 2006, the evaluation committee concluded that the conditions for taking up the Science System Assessment task needed substantial improvement. Additional governmental funding was needed. Furthermore, it advised to make SciSA a formal institutional task, to be taken up in its government decree.⁶²

8.1.5 2006 to present: further aligning trustworthiness and impact

The 2006 evaluation committee repeated an important recommendation of the 1999 evaluation: the institute is to further improve visibility and impact. Improvements had been made, but there is more to gain. The Rathenau Instituut could act less modest. The committee advised the institute to look for activities that show off. The Minister of Science underlined this observation: “the institute is of good repute. It is known to be thorough and impartial, but it can become more widely known, with a stronger profile, also within the parliament.”

The evaluation committee stated that improving the institute’s knowledge base is an important condition for taking up a more authoritative and influential role in expert spheres, policymaking and public debates. For this reason, the 2006 evaluation committee advised to do more in-house research. In response to this, the Rathenau Instituut started contracting more senior researchers with strong backgrounds in social science (preferably holding PhD titles), selected on their potential to act as ‘public intellectuals’.⁶³

In addition, a further professionalisation of communication activities took place, leading to a new house style in 2007, with a new logo, a new website, the launch of a corporate magazine called *Flux* in 2009, activities on social media (Twitter, LinkedIn) and an RSS feed service. And as of 2011, the ‘Message to Parliament’ was brought down to a two page ‘Research Brief’, which summarises the project’s main findings and states policy recommendations.

To further increase visibility and political impact, it became corporate policy to aim for trustworthiness and a professionalised media performance at the same time. This means: operating on the edge, taking a more provocative approach, drawing attention from the press and politicians with clear messages that matters for policymaking. At the same time, these messages should be sufficiently rooted in sound research. This balancing act is fine-tuned in an interactive process in which the project team, communication staff and management take part.

8.1.6 Actual institutionalisation

The actual institutionalisation of the Rathenau Instituut reflects its dual nature: being connected to science and politics, and acting independently at the same time. The definition of the institute’s tasks and target groups is rather broad. The formal description (see text box) shows a clear hierarchy in tasks: the institute can perform research, but only with the aim of giving input to the societal and political debate. To safeguard its independency from both government and parliament, the institute is institutionally embedded in the Royal Academy of Sciences. In addition, the institute has an extraordinary position within the academy, having its own, earmarked budget and being supervised by its own board.

⁶² ‘Naar een hogere versnelling. Evaluatie functioneren Rathenau Instituut 2000-2005’, November 2006.

⁶³ ‘The Need for Public Intellectuals: a Space for STS. Pre-presidential Address, Annual Meeting 2001, Cambridge, MA’. In: Science, Technology and Human Values 28: 443-450.

1. The role of the institute is to contribute to societal debate and the formation of political opinion on issues that relate to or are the consequence of scientific or technological developments. This specifically includes the ethical, social, cultural and legal aspects of such developments. In particular, the institute facilitates the formation of political opinion in both chambers of the parliament of the Netherlands and in the European Parliament.
2. The institute continues to work on increasing our understanding of how science works as a system, and, in so doing, integrating all available data and making it more easily accessible as well as acquiring any data that remains unavailable. As part of this process, it is the role of the institute to make information available to the Dutch Cabinet, to both chambers of the parliament of the Netherlands, and to the relevant actors in the world of science, whether requested to do so or not.
3. The institute seeks to establish connections with relevant societal actors while carrying out its work.
4. To enhance the way in which it fulfils this role, the institute may widen its field of activity and seek to establish connections with, for example, counterpart organisations across Europe.
5. The institute may conduct research, or have research conducted on its behalf, in order to support its activities.

Box 8.1 Task description Rathenau Institute. Source: Government Decree (2009).

Over the years, there have been discussions about the tension between the formal responsibilities of the academy and the independent position that the Rathenau Instituut is supposed to have. On the one hand, the institute benefits from the Royal Academy's outstanding scientific reputation. On the other hand, the academy has some formal responsibilities that require a control span.

The 2006 evaluation committee noted that the further strengthening of the Science System Assessment task fortified tensions between the Rathenau Instituut and the Royal Academy of Sciences. A conflict of interest emerged. The Science System Assessment requires an independent evaluation of science. At the same time, the Rathenau Instituut is embedded in the academy that represents scientists' interests.

This discussion was settled with the 2009 renewal of the institute's government decree. In this document, the mutual rights and obligations of the academy and Rathenau Instituut were clarified further. An important element is that the Royal Academy has to place state funding at the institute's disposal without delay. At the same time, the academy's general board has the right to reject the annual budget and financial reporting as proposed by the institute's board, when it has good reasons. In case of disagreements, the minister of Science can call for a mediator to provide advice that is binding.

The physical establishment of the institute, located in The Hague but outside the parliament, illustrates its close position to policymaking.

8.1.7 Financing

The state funding – the “OCW Contribution” of 4.8 million euros in 2010 – is by far the main financial source for the Rathenau Instituut. Contracted research, mainly carried out for the European Commission and to a lesser extent for ministries, counts for 0.5 million euros, listed as “project revenue”. Other sources, such as payment for advice and detachment at universities, make up for no more than 0.045 million euros. The institute does not receive financing from provinces or municipalities, nor does it receive private funding. Main expenditures are the staffing costs (3.5 million euros). Project costs are 1.1 million; material costs 0.6. According to the Government Decree (2009), the institute’s board discusses state funding with the Minister of Science at least once a year.

There is no direct European funding, but on the project level, funding is acquired through participation in the European Commission’s framework programmes. In 2011, the institute was involved in Global Ethics in Science and Technology (GEST), Synthetic Biology for Human Health: Ethical and Legal Issues (SYHBEL), PACITA and security of e-Governance systems. The institute aims at increasing such international funding.

Finances		
Budget allocation		
	Realisatie 2010 x € 1.000	Begroting 2010 x € 1.000
OCW Contribution	4.763	4.710
Project revenue	536	570
Other sources	45	36
Total revenues	5.344	5.316
	Realisatie 2010 x € 1.000	Begroting 2010 x € 1.000
Staffing costs	3.549	3.702
Project costs	1.121	1.487
Material costs	596	717
Total costs	5.266	5.906

Table 8.1 Financial overview
Source: Annual Report 2010

8.1.8 Quality control: a project affair – a public affair

The Rathenau Instituut has no fixed output criteria, such as a minimum number of reports written or events organised annually. Quality control is more like a tailor-made process. It happens at the project level and at the corporate level, and is both internally and externally organised. Public feedback is also an important mechanism for reflecting on the institute’s quality of work. These elements for quality control are summarised in Table 8.2.

	<i>Project</i>	<i>Corporate</i>
<i>Internal QC</i>	research coordinators, communication department	management, board, open debating culture
<i>External QC</i>	counselling committee, expert and stakeholder meetings	5 year evaluation committee
<i>Public QC</i>	feedback from network and society	feedback from network and society

Table 8.2 Matrix of quality control

Internally, the research coordinators are important anchors for keeping up with scientific standards and safeguarding the relevance of project results for society and policymaking. The communication department provides feedback on the clarity of the main project findings and on the events that are organised to communicate the findings to stakeholders, policymakers and the public at large. Such products and ideas for events are further tested by the management and other colleagues, instigated by the institute’s rather open debating culture.

In principle, every project has a counselling committee, in which experts and stakeholders are represented. Further elaboration on project ideas and conclusions is often done through expert and stakeholder meetings throughout the project. On the corporate level, the institute's board gets to see every project plan, and also the final report.

An evaluation committee is installed by the Minister of Science, every five or six years. A self-evaluation, carried out by the institute, serves as important input for the external committee. The 2006 committee consisted of two professors and two former members of the lower house, with acceptance from the Royal Academy of Science and the Scientific Advisory Council on Government Policy (WRR).⁶⁴ The committee started its work by interviewing fourteen members of the lower house, a member of the upper house and several members of the European Parliament. Discussions with other stakeholders also took place. The board of the Rathenau Instituut was given an opportunity to react to the evaluation before it was sent to the minister of Science. The minister sent the evaluation to the parliament, along with his opinion. In 2012, a new evaluation will take place.

8.2 Institutional context of the Rathenau Instituut

In this section, the positioning of the institute in the outside world is discussed. The relationship with its stakeholders is clarified, as well as its ties to other Dutch actors that perform TA or TA-like activities. It concludes with a reflection on the institute's niche.

8.2.1 Relationship with stakeholders

On the project level, there is no formal commitment between the Rathenau Instituut and politics. The institute does not follow the political agenda strictly, in accordance with its functioning at an arm's length from the parliament. This distance from the parliamentary agenda leaves room for the institute to study new scientific and technological developments and emerging issues that have not yet reached the political agenda. It can be forward-looking, anticipating future policymaking. At the same time, bridge-building to politics is necessary, especially when new project results are there. In order to do so, brief and timely communication of project findings is necessary.

One way to communicate project findings is to send the final reports and the two-page 'Research Brief' to the parliament. In addition, the institute participates in expert meetings and roundtable meetings organised by the parliament. The institute also (co)organises such activities. The institute organises workshops for the House of Representatives, the Senate and for the European Parliament (with the European Technology Assessment Group ETAG for Science Technology and Options Assessment STOA). Moreover, members of parliament are invited to public or stakeholder events organised by the institute. Personal contact with politicians and their assistants, both on a corporate level and on the project level and during different project phases strengthen this linkage. Contact with the Clerk's Department, linked to the standing committees of parliament, is also of great value for communicating project results to parliamentarians. The Rathenau Instituut has intense contact with the lower house Bureau for Research and National Expenditure (BOR), through the temporary detachment of one of Rathenau's employees. Furthermore, media exposure is an important way for the institute to reach politicians and to create political awareness.

⁶⁴ Instellingsbesluit Evaluatiecommissie Rathenau Instituut (2006).

Interestingly, a stronger connection to the political debate in the upper house of parliament (Senate) has come up over the years. The upper house's main task is to assess the quality of new laws, developed by the government and already approved of in the lower house. This distance from daily politics allows the upper house to function as a 'chambre de reflection', with more room for in-depth discussions of mid and long term developments. As of 2008, the Rathenau Instituut has organised several expert meetings on behalf of the Senate, on the surveillance society, biotechnology, nature conversation, and the electronic patient record.

The institute also stays in touch with other stakeholders. It invites representatives of relevant ministries, NGO's and companies to become members of a project counselling committee or to participate in public debates, expert meetings or workshops. Moreover, the institute has co-organised several in-house expert meetings at ministries ('Knowledge Rooms'). In the Nanoproject, together with the company Philips the Rathenau Instituut co-organised a visit for members of parliament to the High Tech Campus Eindhoven.

Through publishing in newspapers, magazines and through interviews on radio and television, the Rathenau Instituut aims at reaching a broad audience. Publications are freely available on the website, except for books issued by commercial publishers, such as *Kidney for Sale*, *Womb for Rent*, *Global Trade in Bodily Material* and *Energy in 2030: Decisions for Today's Society*. In addition, the institute challenges the public to think about issues related to different technologies through so-called technology festivals⁶⁵ and other public events. Technology festivals have been organised in 2001 (Night of Reproductive Health), 2003 (Homo Sapiens 2.0), 2006 (Brainspotting) and 2008 (The Glass Body), the latter in cooperation with the national newspaper *NRC Handelsblad*.

The relationship with the broader public is twofold. First of all, the 'lay citizen' is a receiver of information. Through the media and the institute's website, project results are disseminated into society. Secondly, citizens participate in TA projects through focus groups, citizen forums, and surveys. Citizens' visions on scientific and technological issues are important input for assessing the societal impact of scientific and technological developments.

8.2.2 Relationship with other TA and TA-like activities

In the Netherlands, the idea of Technology Assessment is firmly rooted in the academic field of Science and Technology Studies (STS). As of the 1970s, Dutch scholars have made important contributions to the development of STS. It is not surprising that nowadays the formal and informal linkages between the Rathenau Instituut and STS academic research groups are strong. Over the years, many scholars have been contracted to carry out research for Rathenau projects. Moreover, a number of board members have a background in this field. The Rathenau Instituut is also a member of the Netherlands Graduate Research School of Science, Technology and Modern Culture (WTMC). Technology assessment also benefits from a number of other academic disciplines, such as innovation studies, ethics, philosophy (of science), political science and policy studies. Of further relevance is the work of the Netherlands Study Centre for Technology Trends (STT), which is partly private, partly publicly funded and which is more focused on foresight studies.

A number of researchers from the Rathenau Instituut are involved in academic research and teaching in the field of TA. The Rathenau Instituut holds a chair in the Ethics of Technology Assessment at Utrecht University and has a research fellow in Innovation Sciences at Eindhoven Technical University. Employees contribute to academic courses on TA, both structurally and as guest lecturers.

⁶⁵ 'Participatory Methods Toolkit. A practitioner's manual', Slocum, N. (2003), viWTA/King Baudouin Foundation.

For specific domains, the institutionalisation of TA has taken place in research communities outside of the Rathenau Instituut. The Centre for Society and the Life Sciences (CSG) addresses social, juridical and ethical questions about genomics. Another example is the embedment of TA within the Nanoned programme (continued in NanoNextNL), a cooperation between companies and universities for research on micro and nanotechnology. Furthermore, the Commission on Genetic Modification (COGEM), a governmental advisory body, addresses ethical, social and environmental issues regarding the production and use of genetically modified organisms. Moreover, societal assessments of technology take place at centres for applied research, such as the Energy Research Centre of the Netherlands (ECN), TNO and LEI Wageningen UR.

The work of several governmental advisory councils resonates or to some extent overlaps with the work of the Rathenau Instituut, like the Scientific Advisory Council on Government Policy (WRR), the Advisory Council for Science and Technology Policy (AWT), the Health Council and the Councils for the Living Environment and Infrastructure. Something similar holds for the National Institute for Public Health and the Environment (RIVM), the Netherlands Environmental Assessment Agency (PBL) and the Netherlands Institute for Social Research (SCP). Furthermore, the Ministry of Agriculture has had a programme on TA since 1993, established in connection with the Rathenau Instituut, currently evolved into the Platform Agriculture, Innovation and Society. A separate Ethics Council is nonexistent in the Netherlands. The Rathenau Instituut regularly cooperates with the above mentioned research institutes and advisory bodies.

On the international level, a connection with TA and TA-like activities in Europe and Asia is sought. The Rathenau Instituut is a member of ETAG, the European organisation for parliamentary technology assessment institutions. The institute regularly participates in European framework programmes, like SYBHEL (Synthetic Biology for Human Health, the ethical and legal issues) and GEST (Global Ethics in Science and Technology). Through the mediation of Netherlands Office of Science and Technology (TWA), the Rathenau Instituut sends out trainees and employees to Asian countries (Japan, China, South Korea) on a regular basis, covering ICT, nanotechnology, biobased economy and raw materials.

8.2.3 Reflection on the institute's niche

Assessing scientific and technological developments from a societal perspective in combination with promoting public discourse and the formation of political opinion provides the Rathenau Instituut a unique position in the Netherlands. Other actors contribute to the popularisation of science (such as journalists and debating centres), policy advice (such as advisory councils) or informing government and politics (such as consultancy firms). However, none of these parties is as active in connecting these elements. It is exactly the combination of evidence-based reports, participation processes, a professional attitude towards media attention, the parliament as explicit addressee, the long duration of monitoring activities (typically several years) and the flexibility of subject choice and working methods that makes the institute unique. The institute tries to work as a broker of knowledge and visions, creating new networks, getting parties to talk with each other instead of talking about each other. This goes beyond facilitating. The institute actively searches for emerging issues, reflects independently on the interaction between stakeholders, and tries to translate facts and (conflicting) viewpoints into policy advice.

This rather free working method does come with a drawback. The diversity of activities makes the identity of institute more difficult to grasp for outsiders than any of the other parties that are involved in decision making on scientific and technological developments.

8.3 Organisation of work at the Rathenau Instituut

In this section, we describe the formal organisational structure at first. This is followed by a description of how this works in practice in terms of work plans, priority setting and what is expected from TA practitioners at the institute. The types of projects and output are discussed, completed by a reflection on the criteria for success.

8.3.1 Organisational structure

On 31 December 2010, the Rathenau Instituut employed 54 people. Sixteen of them worked for the Technology Assessment department, 21 for the Science System department. The communications department consisted of 7 employees. For the Management & Support department, ten people were employed that also worked for two other institutes of the Royal Academy of Sciences. Besides the regular staff, there were three people seconded, four guest employees, five interns, three student assistants and two trainees.

On a project level, an important part of the research, the illustration work and the practical organisation of events is contracted out to third parties, supervised by project managers from the Rathenau Instituut. Often a large part of the research work in a project is outsourced in smaller parts to several parties. This helps avoid that the focus in research is dominated by one viewpoint. Introductory and concluding chapters, press releases and announcements are written in-house.

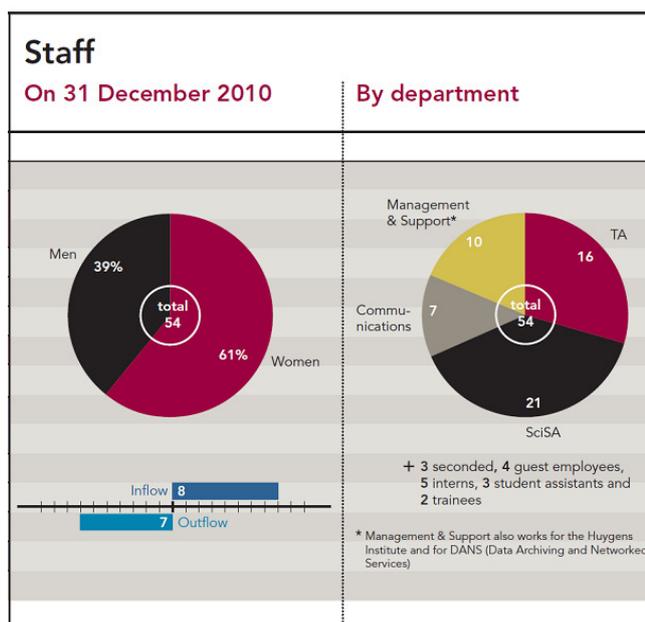


Figure 8.1 Overview of staff.
Source: Annual Report 2010

8.3.2 Priority setting: continuous realignment

The two-year work programme is the most important driver for the projects to be carried out. In the programme for 2011 and 2012, nine themes covering relevant scientific and technological developments were defined. The themes range from *Autonomy in healthcare* to *The value of science*, from *Urban society* to *Excellent science*.⁶⁶ A new work programme usually has strong linkages with the previous one, but priorities and focus evolve over time.

The process that leads to a new work programme is bottom-up and top-down at the same time. When a new programme has to be written, all staff is requested to give input, leading to a list of topics that is discussed internally. Management and coordinators start prioritising and clustering. In the next phase, a draft version of

⁶⁶ See <http://www.rathenau.nl/publicaties/work-programme-2011-2012-1.html> for the complete work programme.

the programme is discussed with the institute's board, which is formally responsible for establishing the programme. The board is obliged to consult relevant institutions and organisations, at least the Royal Academy of Sciences (KNAW) and the Scientific Advisory Council on Government Policy (WRR). The minister of Science, too, is to be consulted. The minister ultimately sends the work programme to the lower and upper house, accompanied by his or her opinion.⁶⁷

More tacitly, there is a continuous internal process of scanning the horizon for relevant themes. Coordinators and management have an important function as 'trend catchers'. Upcoming sociotechnical trends, like the information society, the green economy and the convergence of nanotechnology, biotechnology, information technology and cognitive science (NBIC) are spotted in an early phase and judged on their relevance for parliamentary TA. In addition to this, senior and junior researchers spot for trends in their own fields of expertise.

When starting a new project, a lot of effort is involved in translating the programme theme into a clearly defined project plan. In fact, the theme has to be rethought on a project level instead of a thematic level. Project leaders are responsible for writing the project plan. After thorough discussions with coordinators, management and the communication department, it is sent to the institute's board for approval. Three criteria are applied in this process of clarifying and fine-tuning a project plan. It should contain a technical and/or scientific component; the topic should be politically, societally and/or morally relevant; there should be a need for a "twist" in the societal or political debate: deepening, broadening and/or intensifying it.⁶⁸

Although a lot of effort is involved in writing the project plan, it is hardly ever the case that the plan is 'simply' carried out. Project leaders continuously realign the project activities to developments in the outside world, in discussion with coordinators, communication department and management. It is a deliberate management choice to allow for this manoeuvring space within the practicalities of a project, instead of taking a project plan as a blueprint that only needs checking on milestones and budget. The rationale is that the chances of impact increase, when such externalities are accounted for in the project.

There is also some room to deviate from the work programme. This is partly due to the fact that some of the 'old' projects still need completion within the timeframe of the new programme. Furthermore, it is a deliberate management choice to maintain some flexibility, in order to deal with unforeseen external demands. Especially when a political need becomes apparent, the Rathenau Instituut wants to have some 'spare capacity' to meet this need.

8.3.3 Challenging researchers out of their comfort zones

The Rathenau Instituut entails a broad mixture of professionalism, ranging from philosophy to policymaking, from engineering to journalism, from ethics to political science. Domains of expertise include life sciences, natural sciences, energy and health care.

Despite the different backgrounds, the profile of a TA officer at the Rathenau Instituut is surprisingly uniform. Sound research skills, good presentation skills and openness to experimentalism and debate are required at the same time. 'Successful' employees are able to combine the loneliness of retreat, needed for finalising a concluding chapter, with the excitement of participating in public engagements. The work

⁶⁷ Government Decree: 'Instellingsbesluit Rathenau Instituut.'. Besluit van de Minister van Onderwijs, Cultuur en Wetenschap van 3 juli 2009, nr.OWB/FO/130825

⁶⁸ Criteria taken from Self Evaluation Rathenau Instituut 2000-2005.

demands researchers to accept that one's 'personal' research findings will always be reframed by the management or communication department when the findings are to go public. At the same time, the researcher is always responsible for ensuring that statements in the public sphere are still grounded by the project. Balancing on this thin line is an important skill.

It is corporate policy to challenge researchers to leave their 'natural' comfort zones in order to enter the public arena. But not without firm internal quality checks and professional training in communication, writing opinion articles, networking and lobbying. Staff at the TA department work closely together with coordinators and staff from the communication department, especially when it comes to writing final chapters, summaries and policy recommendations.

Despite the investments done in developing researchers' diverse skills, the need for 'fresh blood' in research is still acknowledged. The compromise, taking Dutch employment laws into account, is to offer each TA officer, in principle, a temporary contract two or three times, for a maximum of six years in total. Research coordinators, the communication department, support staff and management are exempt from this rotation policy; these employee categories are offered fixed contracts.

8.3.4 Types of projects and output

The types of projects carried out at the Rathenau Instituut are diverse. The TA department is entitled to approach a broad range of domains, ranging from health care, ICT, chemistry and biology to climate change and sustainability. The task description of the institute is domain independent, unlike most advisory bodies. As the 1999 evaluation committee stated, which is still relevant: "*The Rathenau Instituut is entitled to broaden its working area to all those areas for which special advisory bodies have been established. The institute has to be able to take up these issues from the perspective of Technology Assessment.*" An overview of current and past projects can be found on the website: <http://www.rathenau.org>.

The domain of the institute is further broadened by taking up the Science System Assessment task. The following table gives an overview of the TA projects that were carried out in the period 2008-2010. The other table lists the projects for SciSA. For the period 2011-2012, both departments have committed themselves to carrying out one integrated work programme.

Range of methodologies

The range of methodologies that are used in the projects is also broad. Most often, several methods are combined in one project. Every project involves research: fact finding, clarification of trends and interpretation. Desk research, interviews with stakeholders, external experts and public surveys may contribute to this. One or more expert meetings or stakeholder events are often planned. Communication about the project and its results to politics, stakeholders and the broader public is an explicit task in every project. At times, artistic methods are used, such as film or theatre.

The balance between these approaches may vary. In the project *Energy in 2030*, the research method was dominant, leading to an exceptionally thick publication of over 400 pages, with many experts involved in writing. By contrast, the technology festival *Glass Body* was mainly aimed to raise public awareness, without much additional research. The event set out to show that – and discuss how – borders of privacy and autonomy shift through new developments in health care, ICT and marketing. In other projects, like *World Wide Views on Global Warming*, citizen participation is used to address the societal impact of relevant

developments. The balance between approaches in a project is clarified in the project plan and adjusted along the way, taking relevant political and societal developments into account.

Output⁶⁹

In the period 2008-2010, the Rathenau Instituut produced 176 publications, mostly reports (78), followed by book chapters (40), peer reviewed scientific articles (38) and popularised contributions to magazines and daily or weekly papers (28). In addition, ten books were edited.

Besides publishing, also other scientific, public and policy-related activities are considered as relevant output of the institute. From 2008 to 2010, the institute provided for 37 keynote and 129 other scientific lectures and (co-)organised 43 scientific events such as conferences and workshops. The same period of three years saw 384 public performances by Rathenau employees, many of them as invited speaker or expert. 82 of these external events were policy oriented. In addition to this, the institute itself organised 38 public events, 56 expert meetings and 34 meetings that were policy oriented. Furthermore, 60 reports were produced.

Press coverage

In 2009 and in 2010, the Rathenau Instituut featured in the media on some three hundred occasions each year, as illustrated by Table 8.3.⁷⁰ The television consumer programme Radar, for example, carried an item about our recommendation that medical devices for home use should bear some official 'seal of approval'. The national newspaper *Trouw* published a series of opinion pieces about human enhancement. *NRC Handelsblad* featured an extensive article about robotics, and the regional newspaper *Stentor* devoted much attention to the Electronic Patient Record. The Rathenau Instituut's members of staff were also regular contributors to influential journals such as *Elsevier*, *De Groene Amsterdammer*, the newsletter of the Euro-Asian Academy, *Onderzoek Nederland*, *Science Guide* and the prestigious *Nederlands Tijdschrift voor Geneeskunde*. Rathenau researchers contributed to more than twenty-five television and radio programmes in 2010, and wrote fifteen opinion articles in the printed media. That same year, the Rathenau Instituut was mentioned fifteen times in parliamentary documents and parliamentary debates.

Press	
Opinion pieces	15
Television interviews	6
Radio interviews	21
Other media (online and offline)	248
Total	290

Table 8.3 Overview of press occurrence.

Source: Annual Report 2010

Internet

The corporate website (www.rathenau.nl) was visited more than 100,000 times in 2011 and had over 350,000 page views. 3301 documents were downloaded from the website. About 7 per cent of the visitors visited the English language version of the website (www.rathenau.org). In addition to the website, the Rathenau Instituut is active in several social media. The institute has its own page on Facebook, and the number of Twitter followers exceeds 1700 (September 2012). On the corporate blog site, researchers from the Rathenau Instituut share their thoughts and observations. The blog 'intimate technology', for instance, addresses the closeness of technologies such as social media and robot and game technologies. All Rathenau activities are shared in a digital newsletter, which is sent out once a month.⁷¹

⁶⁹ Numbers taken from Rathenau Fact Sheet 2010.

⁷⁰ Numbers taken from annual reports 2010 and 2009. For 2008, press coverage was not counted.

⁷¹ Facebook: www.facebook.com/pages/Rathenau-Instituut/141853865847586. Twitter: www.twitter.com/rathenauNL. Corporate blog: rathenaunl.wordpress.com. Intimate technology blog: intiemetechnologie.wordpress.com

Reflection on criteria for success

Because of the broad and rather open mission statement of the Rathenau Instituut, various criteria may account for its success. It is for this reason that the institute has started to monitor the wide variety of indicators we just discussed. The institute's tasks relate – but are not limited – to informing politicians, policymakers and the public at large about relevant scientific and technological developments, clarifying the impact of these developments on society and producing policy advice. In accordance with this, important – but not the sole – indicators for success are references made to the institute's reports and activities in the parliamentary debate and in the media, as well as invitations for Rathenau staff to participate in parliamentary hearings and to act as experts in the media.

More broadly speaking, the success of the institute – or the impact the institute has on other actors, in terms of raising knowledge, changing attitudes and initiating action⁷² – is hard to trace. Timing, related to the political and industrial innovation agenda, is essential. But even when results of a TA project arrive at the right window of opportunity, reference to the work of the institute may occur behind closed doors, invisible to others. Such 'invisible' impact might be successful in terms of stimulating the formation of opinion, but unnoticeable to others. The evaluation committee partially overcomes this invisibility of impact by actively interviewing relevant stakeholders, including politicians, about the relevance of the institutes' work.

8.4 Case study: Global trade in human biological material

The foregoing sections made clear that over the years, the Rathenau Instituut has developed a broad portfolio of projects, in terms of topics, methods and stakeholders. From this variety of projects, we have chosen *global trade in human biological material* as a case study. This project is a clear example of aiming for media attention as leverage for getting political impact, which the institute considers important.

The case study describes the way in which the Rathenau Instituut has built awareness among the general public and members of parliament about emerging markets for human biological material and the need to discuss its potential implications. The main outputs of this project are a book and a TV documentary. This analysis focuses on the political process of framing and agenda setting. More information about the content of the project can be found via www.rathenau.nl/en and the project website: <http://www.rathenau.nl/en/themes/theme/project/emerging-markets-for-human-tissue.html>

The project demonstrates how the human body has gradually become a commodity. Tissues, cells and organs have gained financial and exchange value. Products are being developed with blood, bone or foreskin as the core ingredient. Organs, ova and sperm are for sale online and on the global market. Wombs are rented out by surrogates. Commercial organisations make a profit out of human body parts, donors are willing to sell and recipients are willing to buy. As such, a global market has arisen for human biological material. This probes issues around donation and consent, about (inter)national law and morality, about solidarity and welfare, and about the way in which we perceive our bodies.

⁷² Typology of impacts (raising knowledge, forming attitudes/opinions, initialising action) taken from M. Decker and M. Ladikas (Eds.), *Bridges between Science, Society and Policy. Technology Assessment – Methods and Impacts*. Berlin: Springer (2004).

8.4.1 Research background, design and strategy

The project on markets for human biological material was essentially a follow-up to a 2009 study on the storage and (re)use of human tissue in hospitals. The main outcome of this project – which included a public survey – was that the public and patients in the Netherlands are not aware of the fact that their tissue is being stored and potentially reused for research or transplantation. With high levels of trust in medical practice and science, this is unproblematic as long as commercial use of the tissue is being excluded without prior and active informed consent. Several years ago, a Dutch human tissue act was announced. The Dutch secretary of Health expressed an explicit need for informed consent for commercial reuse. An important issue, though, was the lack of a clear (legal) definition of this commercial reuse. Because of both the sensitivity of the subject and political engagement, further research was needed to feed the public and political debate.

So the topic was put on the research agenda of the Rathenau Instituut both because of political momentum and anticipated policy development and because of existing in-house research experience and a well-functioning project team wanting to further be immersed into the subject matter. The follow-up project started with a project plan that was discussed by members of the management team and board. Furthermore, a counselling committee was installed consisting of high-level stakeholders in order to keep close contact with different constituencies in the field, which eased, for example, access to interviewees and data.

The research itself kicked off early 2010 with a broad horizon scan of potential ways and practices of commercial use of human tissue, cells and organs. Along the documentary and internet research, focus narrowed down to specific cases that would represent the diversity of markets in which parts of the human body were commodified. This led to the following breakdown in terms of research focus:

- 1) Classical donation markets: blood and organs (specifically: kidneys)
- 2) Emerging reproductive markets: egg donation and one-stop-baby-shops (including sperm trade, fertility treatments and surrogacy)
- 3) Recycle markets: biotech products based on human foreskin and bone.

Methodology

Methods included 26 interviews with a variety of stakeholders: donors, patients and intended parents, clinicians, companies, scientists, lawyers, brokers, and other organisations involved in the donation or trade of human body parts. In addition, the research team undertook fieldwork trips to labs and hospitals, both in the Netherlands and abroad (Los Angeles area and London).

Given the scarcity of reliable information and empirical data, the main aim of the data collection was to gather first-hand and up-to-date information via interviews and visits to organisations as a means of ‘fact finding’. A substantial part of the data was gathered via online forums and company websites. This was then followed up by interviews, telephone or email conversations and sometimes onsite visits. The research objective throughout the project was on empirical data collection rather than theoretical or conceptual reflection on issues of donation, solidarity or trade.

Design and impact: media and communication

From its early design and proposal stage, the project was targeted at a broader audience; media visibility was considered an important tool in order to reach a broader public and to make political impact. The institute’s communication department secured support and a media strategy was designed fairly early in the research process. This was reflected in the output: a book was published for a broader audience by a large commercial

external publishing house, and a TV production was broadcast for a broad audience that the institute would normally find more difficult to reach: adolescents and less highly educated professionals.

The book and the documentary were designed to mutually feed and complement each other. For example, research for the book was also (partly) used for the documentary, and while the documentary was produced externally, the Rathenau team was in close contact with the production house. The media and political strategy were explicitly aimed at stimulating debate on issues of donation and the commercialisation of the human body, with the institute's researchers as main experts on this subject matter. The next section provides more insight into the two tracks of the book and the documentary, while the section that follows elaborates on media and political impact.

8.4.2 Output: book and TV documentary

The book: kidney for sale, womb for rent

On 4 March 2011, the book *Kidney for Sale, Womb for Rent. Global Trade in Bodily Material* by Rathenau researchers and authors Ingrid Geesink and Chantal Steegers was published by Bert Bakker, the largest non-fiction publishing house in the Netherlands. The first edition saw 2000 copies, which is slightly above average for this kind of non-fiction work, and the second edition, also in March 2011, saw an additional 1500 copies. Current sales figures total around 3000. The book cover is included here as Figure 8.2.

The process of getting the book published took about a year, from the first proposal to deciding upon the final publishing house. The institute paid 10K towards a full colour print edition of the paperback, in order to include images alongside the writing, but otherwise no financial compensation was expected or paid.



Figure 8.2 Book cover

During the writing process the authors changed editor, and the expected deadline was brought forward a few months which gave extra pressure, because a broadcast date was fixed for the second track of the project: the documentary. It was necessary to have the book available in store before the documentary was broadcast on TV in order to reach maximum synergy and impact. The first copies of the book were delivered on 2 March 2011, just in time for the selective distribution to members of parliament (see below), the book launch on 4 March and the documentary premiere that same night, and the public broadcast the following week on national TV.

The TV documentary: baby for sale

The choice of a TV documentary as TA tool was driven by a desire and need to reach a broader public than usual, especially younger people and less highly educated people. The institute did not have previous experience with TV documentaries so this project was a pilot. After consultations with several documentary production companies and a gross estimation of the average production cost (150K), a total budget of 70K euros was approved by the Rathenau board. This covered half the production cost as required by the Dutch Media law that guards independency in broadcasting. One of the largest production companies, Pieter van Huystee Film, had professional connections with the public broadcasting company BNN that mainly caters for adolescent viewers. Based on scenario research and similar attitudes towards the final product, the Rathenau Instituut signed for a tripartite contract with the production house and the broadcast company.

Parallel to the research for the book, the Rathenau team (two researchers and one communication officer) worked in close connection with the research and production unit of the documentary makers. It was decided to focus on the emerging baby market, but it proved difficult and time-consuming to find people willing to participate and testify on camera. Figure 8.2 shows the documentary poster that was created. The final product, a 50 minute documentary, contained three story lines: A Canadian couple travelling to India for a surrogate for their first child; A Dutch single woman in her late thirties traveling to Belgium to freeze her eggs; and finally a Dutch gay couple's attempts to become legal and biological parents by means of a surrogate mother and egg donor. These storylines were presented by Sophie Hilbrand, the widely popular anchorwoman of broadcaster BNN.

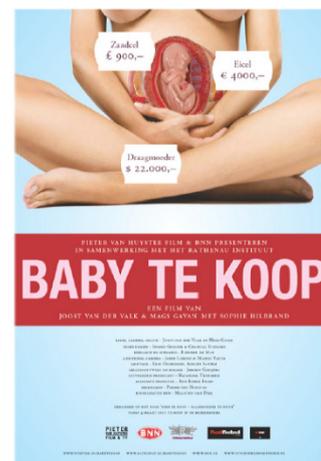


Figure 8.2
Documentary poster

The communication and media strategy had to be agreed upon by all parties involved: Rathenau Instituut, the production company, directors, people featuring in the documentary, host and presenter, broadcast company, media legislator and TV net manager. While challenging, this worked out well in practice. Several websites were launched and a joint press release was issued. Currently the documentary can be downloaded for free on several internet sites, such as <http://www.uitzendinggemist.nl/programmas/2871-baby-te-koop>. The total number of TV viewers was 470,000, which can be considered successful for a documentary, but less so for an average programme on prime time TV. In terms of total reach from a TA and Rathenau perspective, the documentary turned out to be one of the most cost-effective tools, especially considering the difficult-to-reach target group of adolescents. Political impact via the documentary was more difficult to rate. Here the debate ignited by the book seemed more crucial.

Bringing across the message, stage 1: media as generator

Media impact was an important aim and tool to create public awareness and to stimulate public debate, but also to reach members of parliament so as to foster political debate. The means included press releases, an opinion article for a large national daily newspaper, interviews and book reviews. The researchers received intensive media training on formulating the key results and 'take home message', which was in turn discussed with other staff involved (including management, head TA, the director and communication officers) by means of questions & answers sheets, a key message training, internal discussion about the press release, opinion article, and about potential pitfalls, and so on. The main aim was to formulate one clear message to the public and parliament, consistent within the institute. Along with the book's publication on 4 March, a press release was issued by both the Rathenau Instituut and the publisher, after a week-long embargo on a large national press database (ANP press support), in order to give journalists time to read and write up their stories, and to interview the authors. Furthermore, the publisher sent a manuscript of the book was sent under embargo to about twenty journalists and editorial desks, and upon request by others. In addition, a YouTube video was produced and put on the Rathenau Instituut's website (see www.rathenau.nl/niertekoop), with short introductions by the authors on the subject. Social media (LinkedIn and Twitter) were used on the day of the book launch.

While it was considered tricky to rely on media embargos, channelling all media attention to one specific date proved useful and effective. On the morning of 4 March, all major newspapers covered the topic with reference to the institute, book and/or authors (some with headlines, others with photos and infographic images of the worldwide trade). This led to a multiplier effect: there were several requests for live radio

shows and TV requests by major channels and news shows. One of the authors was interviewed live during a popular late night news show (Pauw & Witteman), with more than one million viewers. The subject was headlined at several prominent news sites as well.

In the afternoon of the same day the Rathenau Instituut organised a private book launch in Amsterdam with some 50 stakeholders, interviewees, close contacts and some friends and family. No official press conference was organised at this stage, and no press was admitted during the book launch.

While at times chaotic, understaffed and stressful, the overall media coverage was considered successful both in qualitative and quantitative terms. The next working day the publisher decided to issue a second edition of 1500 copies of the book. Figure 8.3 give a graphical impression of media coverage.

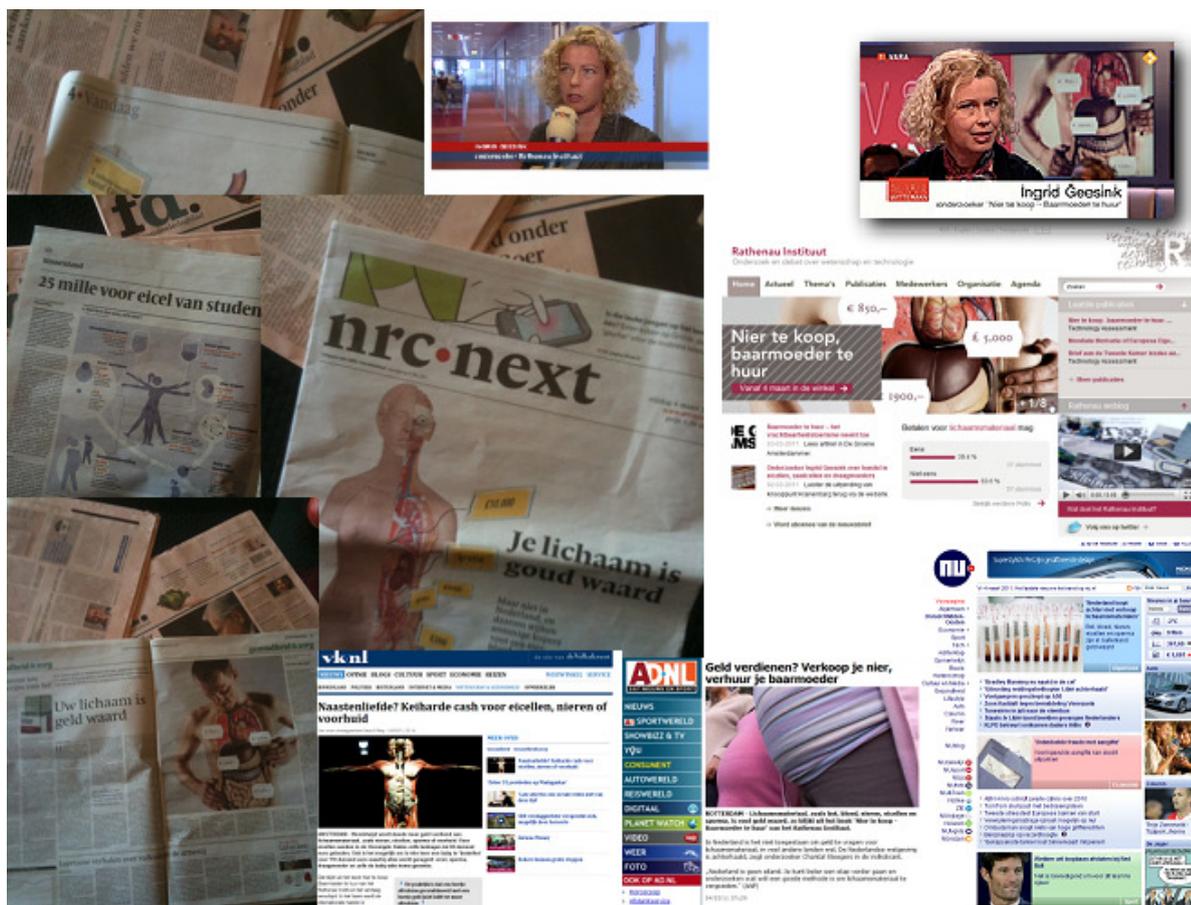


Figure 8.3 Graphical impression of media coverage

Bringing across the message, stage 2: politics and parliament

While successful, the broad media coverage also served a second end: political impact. It was envisaged that politicians would be alerted more ‘spontaneously’ to the Rathenau message through discussion in the paper or on television. While parliament showed interest in the topic and issues at stake, it was the media attention that made it topical for the political agenda.

Already before the book's publication and the broadcasting date, Rathenau researchers suggested to approach members of parliament with a so-called VIP treatment: a package consisting of the manuscript of the book with summary of main findings, a copy of the documentary and a live briefing in parliament on the subject matter. This VIP pack was to be delivered before the book's publication, in order to give members of parliament a kick-start.

Subsequently, the director of the institute got in touch with the clerk of the parliamentary committee for Health to check possibilities. The Health committee was indeed interested in the matter, but a live briefing in parliament was not feasible until later that month on 22 March.

The (one-hour) public briefing in parliament 2011 included a short presentation by the researchers, introduced by the director of the institute, followed by questions and answers from nine members of parliament. The level of knowledge and involvement was high, given that most members had actually read the book and prepared several questions and issues to discuss. Several days later, official questions were asked to the Minister of Health in relation to the issues that were discussed during the meeting and in the book, with explicit reference to the Rathenau Instituut. The Minister of Health promised to formulate a 'government view' on the matter, which is usually a few page document outlining the relation of the subject matter to current laws and regulations, with a view on how to proceed from there. A ministerial letter to parliament in January 2012 confirmed that the Minister of Health was busy reconsidering the general donation principles. When the Dutch government fell in summer 2012, the topic was further pushed forward.

Parallel to this, the department of Justice and Security also became involved in the subject. This department started investigating the status of commercial surrogacy, and invited Rathenau researchers as members of an expert committee to advise the Minister of Justice on how to legally deal with both surrogacy and international trade. An expert advice was sent to parliament in December 2011. In addition, both researchers joined the national Advisory Council for Health, which is investigating current donation practices in order to advise the government. On top of this, the book resulted in several requests for presentations for patient and professional groups, students, companies, clinics, blood and bone banks, scientists, and so on.

As a final activity, the research team is currently translating the main findings into English in order to reach an international audience, and more specifically to address the European political agenda. For this an infographic was designed that maps out the most prominent international trade routes for human biological material.

Connecting the public and politics: lessons learned

This case study demonstrated the main route of the Rathenau Instituut towards politics and media. 'Timing and targeting' are the main lessons learned in this respect, in particular the timing of synergy of project activities, of informing parliament, and of media and research output, and targeting in terms of the right audience at the right time. As discussed, the media were used to create political momentum. With media communication being such an integral part of the process, the role of expertise within TA staff shifted. While the overall result was positive and successful, there was much pressure on individual researchers and communication officers, reliance on external parties was at times risky, budget demands (for the documentary) were relatively high, and political impact was determined by both media impact and professional connections from within the TA institute. As such, the outcome of the trajectory was uncertain, as all attention and collective effort was geared towards a peak on one day.

8.5 Future challenges for the Rathenau Instituut

Looking at the history and daily practice at the Rathenau Instituut, we see continuous innovation. The formal and informal institutionalisation is clearly an ongoing process. The elements research, public debate and impact on political decision making have always been present. But the anticipation and continuous realignment with the political processes have become more important over the years, with the media as important 'public' leverage for having impact in policymaking.

This process of corporate innovation is stretched out into the future. In 2011, the board, management and coordinators discussed strategic challenges and opportunities for the institute, with an investment agenda as the outcome. Three strategic goals were identified: tightening the institute's focus and mission, creating more synergy between the departments of Technology Assessment and Science System Assessment, and developing a more entrepreneurial earnings model.⁷³

In four years' time, the institute plans to invest from its financial reserves, in order to meet these goals. A new business plan will be developed and tailored to the adjusted focus and mission, with more external funding sources. Furthermore, the institute's informative function regarding developments in science and technology will be strengthened. Investments will be made to reach new target groups, such as schoolchildren. A campaigner is recruited for taking up this task. Moreover, the institute is to strengthen its linkages with the innovation policy agenda, especially on the convergence of nanotechnology, biotechnology, information technology and cognitive science (NBIC). The institute will also strengthen its international visibility and funding.

⁷³ 'Nota strategie en investeringen Rathenau Instituut 2012-2015.'

Chapter 9 Parliamentary TA in Norway

Zsigmond Attila (HAS-SEC), Marianne Barland (NBT), Jon Fixdal (NBT), Katalin Fodor and Ádám Kégler (HAS-SEC)⁷⁴

9.1 The way to the institutionalization of the Norwegian Board of Technology (NBT)

9.1.1 NBT at a glance

The Norwegian Board of Technology was established by the Norwegian Government as a royal decree April 30 1999, after an initiative from the Parliament (Stortinget). The Parliament wanted a body for technology assessment, modelled after the Danish Board of Technology – an independent body with the Parliament as its primary addressee. The formal piece of legislation establishing the Norwegian Board of Technology appeared as a royal decree on November 17, 2000.

9.1.2 Norway: a country with a favourable climate for introducing TA

Norway is a highly integrated member of the EU internal market, including the EU framework programmes for research and Technology (FPs). The R & D intensity (GERD/GDP) is relatively high (1.80 in 2009), close to the EU average.

The business sector is the largest R&D actor, contributing 46% of total R&D expenditure in Norway in 2009. Its share has remained unchanged since 2004, although the target was to raise it to reach 2 % of GDP by the end of the decade. The Higher education sector follows immediately after with 32% of the expenditures. R&D expenditure in the institute sector was 22% of total spending. The eight universities perform the largest part (about 80%) of research in the higher education sector.

Policy reviews, in the form of white papers and public reports ("Norges offentlige utredninger, NOU"), are frequent in Norway. During the preparation of major policy documents, the government typically invites stakeholders extensively to provide input into the policy-making process, which takes place in a large variety of forms, e.g. public or semi-public meetings, conferences or by submitting written suggestions. Major policy measures and/or reforms are also subjected to major evaluations at an early stage in their implementation. Interim reports are openly published and policies become subject to extensive awareness and debate among stakeholders and in the media. The fairly extensive use and openness of both evaluations and indicators in the policy-making process contribute to the transparency and quality of the policy-making process. Other important democratic traditions present in Norway and in other Nordic countries like methods of practical democracy– i.e. the involvement of public at large in the decision-making procedures, and debating important societal questions publicly – among them those concerning technology related issues - with non-experts also considerably facilitated the introduction of technology assessment into political decision-making.

⁷⁴ In alphabetical order.

Technology Assessment Activities in a wider sense (from narrowly-focussed engineering risk assessments through to more wide-ranging work on the social construction and impacts of technological systems) have been part of Norway's activities for a considerable time.

As a leading maritime nation Norway has long had a concern for safety at sea, and the (private) shipping classification society Det norske Veritas has been involved for over a century with the mapping, assessment and regulation of maritime technologies. The society has the primary objective of certifying the safety of new techniques for building and operating ships. In recent years this has extended into a concern with the environmental impacts of ships and offshore technologies, and Det norske Veritas has played a leading role in environmental certification.

9.1.3 Early public efforts leading to the establishment of TA

The Royal Norwegian Council of Scientific and Industrial Research (NTNF) for many years sponsored programmes in risk assessment, and these became particularly important with the emergence of a major oil and gas industry in the mid-1970s. Oil and gas technology posed serious problems concerning safety at work, environmental risk, and regional impacts; indeed the oil industry also had large impacts on the overall pattern of employment and on the economic structure of the country as a whole. All this led to perhaps the first large-scale work on technology assessment in Norway. From 1985 oil and gas became one of the so-called 'priority investment areas' of Norwegian research policy, and in the following six years the public sector spent approximately 150 million ECU on R&D in this field. Just over 5 percent of this went to projects in the broad fields of safety, preparedness and working environment, and a further 5 percent to a programme on 'Oil and Society' sponsored by the Norwegian Council for Applied Social Research (NORAS). The latter programme was closely concerned with macroeconomic issues, with regional impacts, and with general social dimensions of the rise of the oil economy. The programme ended in 1991.

In Norway, as in most advanced economies, the biggest single field of R&D and technology development is Information Technology (IT). In this field the Royal Norwegian Council for Research in Science and the Humanities (NAVF) sponsored an important research programme between 1986 and 1990, called 'Technology and Society: Information Technology'. This was primarily a programme of sociological research, within the field of 'Science and Technology Studies'. In fact, the work of the programme extended outside specifically IT topics into problems ranging from the role of technology in the everyday life of children, to the role of cars in Norwegian society, with many of the projects bearing close links to what is now sometimes called 'constructive technology assessment'.

A further relevant activity was the "Future Oriented Technology Policy" (FREMTEK) programme initiated by NTNF in 1991, and continued by the Research Council of Norway until the end of 1993. This programme supported policy-makers with research on all aspects of technological change, with particular emphasis on the relationships between innovation, economic growth and the social context. The programme had a budget of approximately 350.000 ECU per year.

After the FREMTEK programme ended, the Research Council of Norway established a new group, the STEP Group (Group for Studies in Technology, Innovation and Economic Policy) to continue the work of the programme. STEP had a five-year contract with the Research Council, and a staff of fifteen researchers to carry out research on historical, economic, social and organisational issues relevant for the broad field of innovation policy. Projects covered, inter alia, development and use of new indicators, analysis of R&D performance in Norwegian industry, inter-industry technology flows, mobility of scientific and technical

personnel, history of science and technology policy, and so on. The programme also had a number of projects in the field of risk assessment, and technology assessment at enterprise level.

Another example for a deep need for improvement of the early technology assessment procedures in Norway turned up in the early nineties with the question of fish-farming- explains Matthias Kaiser, first acting director of NBT. The early assessments of that technology (fishfarming) proved to be all very bad because only representatives of certain highly specific areas (farm engineers, economists etc.) were consulted, while other aspects e.g. of fish health were neglected. Examples of other countries especially of the Danish Board of Technology showed ways of improvement the methods to reach consensus. However, there was a strong initial resistance from scientific circles, especially from medicine to involve lay people to in the assessment procedures.

9.1.4 *The way towards a TA institution*

The Norwegian debate on the establishment and necessity of a TA-institution started relatively late, around 1990.

The National Committee for Research Ethics in Science and Technology (NENT) set up in 1990 stressed in two reports published in 1992 the need for better technology assessment procedures in Norway. During its first few years, NENT continued to concentrate its efforts on technology assessment, a task that was eventually taken over by the Norwegian Board of Technology. NENT also played a central role later when the Board of Technology was established in 1999, having responsibility for the secretariat during the first year of the Board's existence.

In 1993 two members of NENT(The National Research Ethics Council –including the above mentioned Prof. Matthias Kaiser) went to Denmark to visit and study the Danish Board of Technology and the Dutch NOTA in Holland. After these visits they recommended the Government to assess different forms of institutions and methods for TA. The Danish model was especially mentioned.

Prof. Keith Smith, head of the STEP Group foresaw already in 1995 that some new form of technology assessment process was very much on the agenda in Norway. He added, that because Norway is a small country, it was improbable that there would be any separate Parliamentary TA activity, and therefore it was very likely that these advice, analysis and assessment functions would extend both to Parliament and to the general public.

9.1.5 *From the critical political momentum to the stabilization of the TA institute*

In a White paper on research from the Parliament in 1993, it was emphasized that several European countries had already TA institutions, and that this expertise was missing in Norway. NENT was encouraged to study ongoing TA activities and stimulate similar activities in Norway.

It has to be added that the first successful pilot-like technology assessment exercises like the public discussion initiated on genetically modified organisms, contributed very positively to the decisions, as it proved the feasibility of the approach and the interest from the wide public to the new method of societal debate-explains Prof. Matthias Kaiser. As a result, in 1995 the first consensus conference in Norway was held, a joint effort by the research ethics committees and The Norwegian Biotechnology Advisory Board.

The new institution was finally born after a “teething period” of a couple of years. In 1995 the first political initiative towards a TA institution was taken in Parliament. The Presidency of the Parliament asked the Standing Committee on Education, Research and Church Affairs to explore and assess the possibility of a PTA unit. It studied different solutions, and it was recommended that the Government formed a TA institution outside the Parliament. The initiative was not taken any further, and it was not until 1997 that the Board was again debated in the Parliament, and the 30th of April 1999, the Board was founded by the Government. The secretariat was placed in the same locations as the national research committees and the Norwegian Biotechnology Advisory Board. The “Danish model” was chosen to strengthen the focus on stimulating public debate and citizen involvement. The first chairman of the Norwegian Board of Technology was Prof Eivind Osnes (physicist, Oslo University).

According to an insider’s analysis⁷⁵ the birth of this completely new institution and the political negotiations by which the institution was fitted into the general structure of governmental- parliamentary governance, does not seem to have been a smooth process, moreover, it was also subject of party battles.

“Interestingly, none of the major political parties opposed the basic idea of creating an institution with a TA mission. If you look at the history of the Norwegian Board of Technology, you will see that the support was across the political spectrum. First the proposition came from smaller opposition parties that were actually in the centre, one slightly left from the Christian Democrats and from the so called „Left Party” but it’s really on the right side. Both are centre parties that were first in the opposition and then in the coalition. You also have one party from the left, the socialist left party” - explains Tore Tennøe, director of the Secretariat. “The interested parties were active in different stages of the discussions.”

He continues, that the debates concentrated on organisational and functional aspects (whether it should be within the Parliament or outside the Parliament, whether it should be an independent or a non-independent organisation, affiliated to the Research Council or to one of the universities, how the results should be used etc.) The reason behind this that if your party is often in position, you might not want an independent institution. If you’re in the government, you would perhaps say that you want something that is close to the government.

The attitude of the parties reflect rather deep differences in governing style-adds Matthias Kaiser, first acting director of NBT. “We are used by all parties, but they are interested in different aspects, some are more interested in values, some are more interested in productivity”-means Tore Tennøe.

There was a discussion between the Government and the Parliament about the regulations in 2000. As a result a White Paper on the Norwegian Board of Technology was presented in 2001. This important political document for the future of NBT was originated from the conservative party minister in the New Coalition government, but it was accepted by all parties - explains Tore Tennøe, director of the Secretariat. That white paper managed to settle the problems of institutionalisation and regulations on NBT were confirmed in the spring of 2002.

Since then, the status and position of NBT has been stable without significant changes, together with its mandate, its location within the system of governance and its budget.

⁷⁵ Kallerud, 2002, http://www.stage-research.net/STAGE/content/case_studies.html

9.2 Actual institutionalization

The Teknologiraadet (NBT) is a public, independent body for technology assessment. The NBT is a consultative office, it advises both Parliament and Government, and raises public debate on topics concerning technology, society and politics.

The objective of the Norwegian Board of Technology is to work in the interface of technology and society, and contribute to further a human- and environmentally friendly technological development. The Board is to assess technological challenges and the possibilities of new technology in all fields of society, stimulate public debate on technology and outline measures regarding technology management.

9.2.1 The tasks of The Norwegian Board of Technology

The tasks of The Norwegian Board of Technology in accordance with the founding chart are as follows:

- 1) Identify and analyse major technological challenges and contribute to a humane and sustainable technological development.
- 2) Monitor international trends, developments and activities within technology assessment and technological foresight.
- 3) Actively stimulate public debate on technology related issues and thereby raise public awareness concerning the impacts and options of technology.
- 4) Initiate reports and holistic assessments of the potential benefits and consequences of specific technologies for both individual citizens and the society at large.
- 5) Communicate the results of its work to the Parliament, governmental authorities and the wider society.

9.2.2 NBT is an independent institution

There are a number of elements in the constituent legal instrument to guarantee the independency of the Norwegian Board of Technology.

Independence might be a strange concept in case of a public institute explains Tore Tennøe., director of the Secretariat. It is not like independence in the American sense, with full private financing, but independence in designing and executing your projects from the basically public funding.

Independence in relation to parliament is very important-says Alf Holmelid, MP- because if you are a member of the parliament you will always feel responsibility to bring forward arguments to strengthen the position of your own party.

Due to its independence, NBT can bring controversial issues to parliament for discussions. Norway is a small country, we need more bodies that are independent from the power of the politicians, of the institutions of power.

On the other hand, independence is a result to be maintained, “and lasts as long as you do a good job” warns Mrs Veie, contact person to supervise NBT at RCN.

An important element of the institutional guarantees for independency is that the Board itself determines its rules of procedures, and it has its own independent secretariat. The Board chooses its own approaches to the problems and decides on which working and assessment methods they should be based.

The other important element of the institutional guarantees for independency is that the supervising authority of the NBT is not the Government represented by the Ministry of Trade and Industry, but the Research Council of Norway⁷⁶.

Although the chair shall be appointed by Royal resolution, the Board itself chooses its Deputy Chairman from among its members.

Regulations exclude having MPs in the board of NBT, since self-advising is not ethical and does not make much sense, also this would impair the independence of NBT. When a member of the Board is elected to member of Parliament, the membership in the Board is terminated.

The NBT is located in the proximity of the Parliament and the Government buildings, but in a separate building to emphasize its independence. The NBT is co-located with the National Committees for Research Ethics.⁷⁷

These committees are administered under the auspices of the Research Council. However, they operate as independent bodies, and have both advisory and informative functions.

9.2.3 Relationship with stakeholders

The NBT has a special relationship with the Parliament. They have meetings and frequent contacts with the parliamentary committees, chairs and administrative staff.

Both Parliament and bodies of the Government welcome initiatives from the NBT and are open for meetings or discussions when proposed from NBT. However, there is no formal obligation of either of these bodies to react on the reports submitted by the institution.

The Board's main target for communicating its work is the Parliament. Here, all the different political parties are represented, not only the ones within the actual Government. In Parliament there is also a broad field of topics represented in the standing committees. It is fundamentally important that the findings of NBT be available for use to all political parties.

⁷⁶ The Research Council of Norway (RCN) has basically three important roles: Firstly, the Council is a strategic adviser on the Government's research policy. Secondly, the Research Council is charged with an operational role in financing research by the business sector, the university and university college sector, and the research institutes. The RCN develops policy instruments, operates research programmes, promotes international research cooperation, disseminates research findings, etc. Thirdly, the Research Council is a network builder for producers, funders and users of research.

⁷⁷ Three national ethics committees have been established to monitor developments in research ethics in Norway:
The National Committee for Medical Research Ethics (NEM);
The National Committee for Research Ethics in Science and Technology (NENT)
The National Committee for Research Ethics in the Social Sciences and the Humanities (NESH)

NBT has a mandate to inform the parliament about the findings of its projects; however, the corresponding committees have no formal obligation to discuss the proposals of NBT, although this is often the case. The typical number of MPs present at such meetings with parliament is “from a few to let’s say fifteen, depending on how relevant the topic is and also on collision with all the meetings and such other factors. However, their participation is on a voluntary basis. But mostly there will be people from the key committees.”-explains MP Alf Holmelid, former member of NBT Board. He says, the absence of formal interaction between NBT and the parliament is a drawback, it would be fruitful to meet the members of the relevant committees regularly, at least once or twice a year.

NBT’s contact person within RCN, Mrs Veie is of the opinion that the number of members of parliament really interested in technology and technology assessment issues is unfortunately too few. The majority of politicians are not interested at all and they know all too little about it.

The Government is also an important addressee, and is often approached after the initial presentation of conclusions and recommendations to the Parliament. However, if the recommendations are addressed to the Government, the report will be handed over to the relevant ministry. This may either be done as part of an open meeting where members from the opposition parties will be given a chance to comment, or through separate meetings in the various ministries

Another important target group is the public. The terms of reference state that the Board should actively stimulate public debate on technology related issues and raise public awareness concerning the impacts and options of technology. The press plays an important role in reaching the public and raising new items on the societal agenda. The Board emphasizes the importance of communication with the broad public and has made considerable efforts to use the most up-to-date channels of communication.

The outputs from projects run by the Board (reports, newsletters to the Parliament, etc..) are freely available on the website and are often published by the media. Unfortunately, the material translated into English on the web-page is considerably less than those in Norwegian.

9.2.4 Institutional context of NBT

Apart from NBT there is only one independent institution in Norway that is dealing with technology assessment activities for political decision-making, namely the Biotechnology Advisory Board. It gives recommendations to the Government, and in questions concerning biotech aspects cooperates closely with NBT, so that the activities are either common or complementary.

In the area of TA NBT has a unique position in Norway and due to its stable status in the last ten years has accumulated a considerable capital of trust. It occupies firmly its niche as an independent institution, providing relevant answers to a wide range of societal questions, and has a strong mandate to liaise beyond the policy makers with the society at large.⁷⁸

Of course, in a wider context many more institutes are dealing with policy making and policy advising. In the field of research and innovation policy the main actors are the following:

⁷⁸ Health technology assessment as a separate specific area has not been taken into account

At government level, the Ministry of Research and Education has the main responsibility for coordinating the overall research policy and is the largest source of government research funds. Several other ministries have large research portfolios and each ministry is responsible for research related to its own sector in society. In addition to the Ministry of Research and Education, the main ministries funding research are: the Ministry of Trade and Industry, the Ministry of Health and Care Services, the Ministry of Oil and Energy, Ministry of the Environment, the Ministry of Agriculture and Food and the Ministry of Fisheries and Coastal Affairs.

The Research Council of Norway (RCN) is the only operational research policy agency in Norway. In addition to funding research, RCN has the mandate to advise the government about research policy and to create communication and coordination arenas for actors of research, industry and government. Despite the loss of its formal status as an advisory body after the reorganisation in 2003, the RCN remains by far the most important and influential organisation in terms of providing research policy advice to the government. It exerts a particularly strong influence on research policy through the budget policy cycle, as nearly 30% of government appropriations for research are channelled through the RCN. It also influences research policy through a large number of informal and formal contacts with most ministries.

The Research Council of Norway has also formal contacts with the NBT. A contact point was assigned in this organisation to liaise with NBT. In the last two years this function has been fulfilled by Mrs Veie, senior advisor of RCN. The contact (especially with the director of NBT) is regular, but the frequency is up to the tasks. "Sometimes it is every week, and sometimes it is one or two months in between the contacts, but they are regularly in contact, exchanging views, discussing prospective topics and also to launch common projects, to work more closely together" says Mrs Veie. The two organisations also cooperate on common technology projects, based on common interests, partially financed by RCN. RCN finds very important the participatory way of working and is of the opinion that it is an important result of NBT that people can get information for discussion in society about technology and for critical ways of looking on technology, what it involves and how it may influence the development of the society and how society can also have impact on the technology, and how to best use technology.

In addition to RCN, advice and input on research policy, however, takes place in accordance with the decision from 2003 to request advisory input from multiples sources regarding government policy-making, which is increasingly also provided by other organisations, in particular the Norwegian Association of Higher Education Institutions.

Other strong players which provide policy advice and input are the Confederation of Norwegian Business and Industry (NHO), which is the main organisation of employers in Norway. The NHO has several sectorial federations, including Abelia – the Association of Norwegian ICT – and the Federation of Norwegian Industries (Norsk Industri), both of which show a strong interest and involvement in research-policy issues. The Norwegian Confederation of Trade Unions (LO) is the largest Norwegian workers' organisation, and it plays an active part in research, innovation and industrial- policy development. Tekna is the Norwegian Society of Chartered Technical and Scientific Professionals, and it, too, plays an active role in the Norwegian research-policy debate.

Extensive formal consultation between the government and major stakeholder institutions and organisations takes place when major research policy documents are prepared. Universities, labour and industry also take an active part in these consultations, while civil society and NGOs normally play more marginal roles in research-policy processes.

Innovation Norway and SIVA are the main public institutions that provide support for innovation, and are in part of their portfolio involved in industrial R&D. Innovation Norway is owned by the Ministry of Trade and Industry and provides programmes and services with the objective of promoting innovation at regional and national level, in mainly small and medium size companies. SIVA (the Company for Industrial Growth) is involved in the provision of science parks, incubators and services to developing companies and venture capital to mainly start-up firms.

9.2.5 Financing

The Norwegian Board of Technology has a budget of approximately 1, 1 million Euro per year. The source for the financing is the state budget; it is delivered through the services of the Ministry of Trade and Industry, channelled through the NRC.

The largest part of the budget is the annual funding from Ministry of trade and industry, an annual amount of approximately 900 000 Euros. This main part of the budget is stable and is important to ensure independence (it allows the Board to select and organise its own projects). In addition to this, they NBT has some external funding from EU-projects and other collaborative projects. Some collaborative projects get partial funding from other national partners (e. g. “You Decide”, Climate summit in the classroom”). The Board prioritizes external projects that correspond with the existing work plan.

The financing covers the salary for the Secretariat staff, the honoraria for the members of the Board and for external experts, overhead, travel costs and cost of events. The members and the external experts taking part in the ad hoc committees receive a honorarium following the state regulations⁷⁹. The NBT also reimburse their travel expenses. Financial auditing is under parliament to maintain independency from government.

Due to the positive outcome of the evaluation of NBT last year there might be a chance that they get more funding on middle term.

9.3 Organisational structure of the NBT

NBT has a two-level structure. The decisions are taken at Board level, while the execution of the projects takes place at the level of the Secretariat, but with a strong involvement of Board members.

9.3.1 The institution's Board

According to the Regulations for The Norwegian Board of Technology laid down by Order in Council on the 17th of November 2000, the Norwegian Board of Technology is to be appointed by Royal resolution for a period of up to four years at a time, with the possibility of one reappointment. The appointment takes place on a free basis. Any interested parties may make proposals. The Norwegian Research Council is asked to provide a list of 25 potential candidates. Members of Parliament cannot be nominated to Board membership.

The Board shall have 15 ordinary members. It shall be composed of persons with broad insight into relevant technologies, creative activity and societal issues. The members come from academia and business and encompass broad insights in different areas of technology and innovation as well as ethics and societal

⁷⁹ In 2011 this was 46,5 Euros/Hour.

issues. Care is taken to select the members according to different competencies. Members of the Board act in their personal capacities, and do not represent their institutions or enterprises. In practice - explains Tore Tennøe, director of the Secretariat- it's worth noticing that the appointments to the Board are meant not to be very political, there may be people from industry and Academia that are constant, but there have never been politicians in the board.

The members of the Board are formally appointed by the Government. The chairman shall be appointed by Royal resolution. The Board itself will choose its Deputy Chairman from among its members.

If individual members withdraw from the Board during their term of office, the Ministry of Trade and Industry may appoint new members for the rest of the term.

A new board was appointed in August 2012. The new Chair of the Board is Mrs. Siri Hatlen (a former Director General of Oslo Univeristy Hospital Ullevål). T The board has 15 members. Seven come from institutes of higher education, two from research institutes and the rest primarily from industry.

It is the Board itself that determines its rules of procedure. The board decides also on its annual programme. Each programme consists of projects to be executed by a method determined also by the Board itself. The Board as far as it is possible, will strive to keep a balance of efforts and projects on the predetermined areas of priority.

The members of the Board have an important role in the quality control of the projects. All experts groups normally include a Board member. They participate in the work like other external experts, but also take care of the relevance and the quality of the recommendations.

9.3.2 The Secretariat

The executive level is the Secretariat, with a staff of nine persons.

The Secretariat is led by the Director, Mr. Tore Tennøe. He is responsible for monitoring, impact assessing, auditing and quality assurance of all projects, as well as the Board's relations with Norwegian and European parliamentarians and policy makers.

Each main area of activity (e.g. climate, health, various applications of internet) has at least one project manager within the Secretariat. In addition, there is an officer responsible for communication. Projects are coordinated by the project managers who also lead the work of the expert groups.

9.3.3 Organisation of work at NBT

All work is organized around projects. The Board decides independently which projects are adapted, and Board members are represented in all project groups. In the end phase, the projects are presented to the relevant standing parliamentary committee, often in combination with an open meeting at the Parliament. Box 9.1 gives an overview of projects that have been carried out over the last three years.

Projects to be executed are selected in a flexible manner: there are so-called core projects that are part of a biannual work-plan, but Board has complete liberty to decide on new projects at any meeting.

Projects of the core portfolio are selected in a balanced way. Every second year, the Norwegian Board of Technology decides on a core portfolio of projects for the next period. By making a biannual work program

it is possible to cover different technologies and policy areas (such as Climate change and low carbon technologies; eHealth and welfare; Internet policy and privacy; Emerging technologies), as well as different TA methods.

The board uses various methods in identifying new projects, Every second year the Board has invited research institutes, business and industry, private persons, public administration and politicians to brainstorm, as well as an open invitation to the public, in order to obtain proposals for topics and projects for the Board's agenda. This ensures that the Board's agenda stays transparent and open, and gives thematic inputs from many different areas of society. In addition, the Secretariat makes an analysis of societal developments, technology trends and provides an overview of what is going on in international TA, and on this basis also proposes project ideas.

Jon Fixdal, project manager of NBT explains the selection procedure the following way: “the selection is quite a thorough process. Normally, when we get a project idea, it can be us at the secretariat that comes up with the idea or it may be an external person who proposes it. We make first an assessment then we introduce it to the board, the board may have a discussion and they send it back to us, and we make further investigations and then the board finally decides whether to run the project or not. Every second year in the fall we have a huge process, where we invite everyone (well at least interiorly everyone, a broad spectrum institutions and individuals) to make proposals for projects for the next 2 year period. Then we typically will get 60-80 project proposal ideas on all kinds of topics, the process goes through several steps, it will typically end up between 8-10 projects for the next period.”

After such broad processes for gathering new project ideas, the secretariat makes a list with short descriptions of 50-100 project ideas. The Board then selects approximately 20 projects for a closer scrutiny. All ideas in this smaller group are then evaluated by the secretariat, using criteria such as societal importance, technological component, political interest and added societal value. In this phase, the Board also consults MPs and policy makers to get relevant information and feedback, but not on a formalized level.

The Board makes a final decision on the project portfolio.. Typically, 8-12 projects are selected for implementation. However, the Board has the freedom and flexibility to move fast and decide on new projects at any meeting. The work plan always includes some spare capacity to be able to do spin-off projects, to follow up when the parliamentary committees give a clear sign they need input, or to respond to technological developments or unexpected events that were not foreseen.

The Board is represented by one member in in all expert groups . They are active members of the expert groups like any other member. They report back to the Board together with the secretariat. Concerning the final documents to be submitted to Parliament/Government the Board approves of the quality of the report and the scope. In projects with expert groups the formulation of recommendations and conclusions is delegated from the Board to the expert group.

In the end phase, the projects are presented to the relevant standing parliamentary committee, often in combination with an open meeting at the Parliament. Usually, the recommendations are handed over at an open meeting or a seminar. In most cases there is a panel discussion with parliamentarians from different political parties. The NBT produce a special publication to the Parliament called “Fra Rådet til Tinget” (“from the Board to the Parliament”), a 4 page publication similar to a POST-note and the Danish document “fra rådet til tinget”. The document is a condensed presentation of the assessments and the recommendations from the project. In some projects this is the final publication, and in others there may be a longer report.

Such a report may be combined with a “Fra Rådettil Tinget”, but this needs not be the case. The recommendations are usually sent to both Parliament and Government at the same time, but first presented for the Parliament.

- Nanotechnology
 - Norwegian Board of Technology recommended to the Government in its report to:
 - Set clear commitments to what information industry must provide
 - Implement mandatory registration
 - Extend producer responsibility
 - Knowledge-based management of nanomaterials for risk assessment.
 - Introduction of specific nano-labelling
- eHealth - the Future of Ageing
 - After a detailed analysis of the demographic tendencies and its health consequences, the report of the Board recommended
 - Home based care technology should be offered to all users of public health care services with smart house solutions.
 - The competence about care technology must be lifted by setting up a national advising centre.
 - However, health care technology must be used with precaution
 - There is a considerable need for innovation policy for the health care sector
- Youth and privacy
 - This was an action against misuse of digital technologies (mainly internet and cell phones) including a survey on electronic bullying and harassment among young people. As a result, an educational resource material was developed together with an internet-based anti-campaign.
 - Since 2007 the teaching material has been translated to 8 different languages and has been used by almost 1 million pupils all over the world.
- Plan B for a Norwegian climate policy
- Genetically modified plants and food
- Internet policy
- Dialogue on Science, Technology and Society
- World Wide Views on Global Warming
 - After a whole day of discussions on climate, 100 Norwegian men and women made their own recommendations that were handed over to the Minister of Environment and International Development on 1st of October 2009.
- Education 2.0
- Business opportunities in the Internet economy
- A greener private car park – 50 % emission reduction by 2020
- A Norwegian Carbon Fund
- Synthetic biology
- Patient 2.0
 - On 20 April 2010, the Norwegian Board of Technology handed over its recommendations for the eHealth project Patient 2.0 to the Health and Care Committee of the Parliament.
 - The Board calls for a total digital upgrade of the healthcare system.
 - The creation of an interactive national health web portal is recommended that should include information on health, prevention and treatment as well as self-service solutions such as medical appointment booking, prescription renewal, access to case information and online forums.
 - Patients should be granted an access to their electronic health records through a secured area of the health portal.
- The Bio-economy
- The Future of money

Box 9.1 Overview of NBT projects of the last three years, together with the most important results (when available in English).

The main channels of communication are the papers presented to Parliament and to the Government. Towards the general public, written press is still the most important way of communication. In the first place, papers most read by decision-makers are targeted. TV is also very important, and it is an important indicator of the societal reaction. Public debates on the national channels are frequent. Scientific publications are not in the scope of the institution. Internet-based appearances (blogs, twitter, facebook etc.) are getting more importance, but this is not typical yet. A much more intensive involvement of the general public would of course be desirable; however it is limited by the availability of resources.

9.3.4 TA approaches and methods

The Norwegian Board of Technology employs a range of different methods in the projects, where the following five are considered primary methods:

- expert groups,
- consensus conferences,
- scenario workshops,
- focus groups and
- open hearings.

All these methods are flexible and can be adapted for each individual project. When a project is launched, the Secretariat proposes a methodological approach and the final decision is taken by the Board. In the majority of the projects multiple methods are used in combination (typically 2 or 3), designed and adapted to the specific topics according to previous experience.

A short characterization of the above primary methods:

Expert groups

Expert groups are used in almost all NBT projects. If other methods are also used, they are normally combined with an expert group.

The NBT expert groups are always broadly constituted. The participants originate from different institutions (academia, NGOs and industry) and areas of learning, and usually vary in their professional association with the given topic. An expert group is used to illuminate a current topic, give advice or provide policy options. The participants are chosen based on their academic expertise or practical experience in the chosen field.

The average size of expert groups is 6 to 8. The criteria of selection of EG members are expertise, competence as well as balance of expertise and competences, if needed and also the balance of interests.

An expert group will usually meet 6-8 times during a project, with 4-12 months typically elapsing between the first and last meetings. A project manager from the NBT (Secretariat) will lead the process and do most of the writing and organizing. The Board members will be briefed on the work, but the making of conclusions and recommendation in a specific project is normally delegated to the expert group. The board is, as mentioned, always represented by one member in the expert group.

Conferences and citizen panels

A layperson conference or consensus conference is an exercise in practical democracy, and involves those who seldom have a forum where they can be heard. The participants take part by virtue of being socially aware citizens. They should not be experts on the topic under discussion, nor should they have prominent positions in organized interest groups that are affected by the given topic. Conference members are recruited through advertisements in the press, or by a random selection of people who are invited to apply for participation.

The core element of a layperson conference or citizen panel is a selection of regular citizens. They advise decision makers within a predetermined, delineated topic. The panel usually consists of 14-16 persons of both sexes and of varying age, residence, education and professional experience.

Laypersons can contribute knowledge and perspectives that experts normally do not bring to the table. We are all non-experts in most areas of life, but we also all have experiences and values which we can use to assess new information. Furthermore, laypersons are not constricted by collegial norms or by direct economic interests.

Fixed procedure

A layperson conference is a method that follows a relatively fixed procedural scheme. This method has been developed in Denmark, and has gradually been taken into use in around 20 countries. The procedure is by and large as follows:

- First, the participants meet for two preparatory weekend gatherings, where they are introduced to the given topic and formulate questions they want to be examined.
- Next, a 3-day conference is arranged where a group of experts first answer the questions from the panel. Then the panel discusses any ambiguities with the experts.
- The layperson panel then withdraws in order to formulate a joint statement. They do this by answering the questions they posed at the weekend gathering and which have in the meantime been illuminated by the experts.
- On the third day of the conference, the panel delivers its statement to the relevant political authorities, such as a member of Cabinet.

There are other methods which adhere to the same principles as lay-person conferences, with slightly varying methods of implementation.

Layperson conferences and citizen panels are well suited methods for discussing key questions that affect many people, often the entire population. The method is a practical way for weighing different pieces of information up against each other, as well as different viewpoints from different areas of expertise. In this manner such conferences may act as a tool in political decision making processes.

At the same time, a lay-person conference is an exercise in practical democracy with a strong signal effect: it shows that is both entirely possible and desirable for people outside of the expert fields to participate in the discussion of technological questions.

The NBT has also used and contributed to the development of other participatory methods such as different citizen panels and citizen summits.

Scenario workshops

Discussion and the exchange of experiences are the core elements of a scenario workshop. The discussions circle around a set of scenarios that are portraits of alternative futures in a given topic. The scenarios may be presented as a movie, lecture, document or some other form. The audience should consist of all major stakeholders. The purpose of the scenarios is to make the participants conscious of future choices involving technology, and encourage them to make critical assessments. Developing new visions and proposals for action may also be a part of the process. A typical output document is a report describing the scenarios, the content of discussions and in some cases, recommendations.

Focus groups

A focus group is a type of brain-storming exercise within a structured group interview. The goal is that conversations conducted in a group of 7 to 10 individuals will bring to light more information than by interviewing participants individually. The participants in a focus group have special knowledge about or experience with a given topic.

The focus group's topic is limited in scope and determined by the interviewer, who is a staff member of NBT. It is nonetheless important that the discussions are open enough for the participants to exchange experiences and comment upon each other's viewpoints. Herein lays a part of this method's strength: the conversations and interaction within the group can bring to light more information than by interviewing the group members one by one.

Open hearing

During a hearing, generally 15-20 individuals or representatives of institutions can give input to a work in progress. Hearings may either transpire in public with prepared papers dealing with key questions or recommendations, or in round-table hearings with plenary discussions. The participants are usually either experts in their respective fields, decisions-makers or representatives of affected interest groups who we believe have special knowledge about the topic. The goal is not to reach consensus, but to get a broad perspective of a field and make sure that all sides are considered before making a conclusion.

Prior to a hearing, the Board of Technology has usually done some preparatory work on the topic. As a rule, an expert group has elaborated a set of key questions or preliminary recommendations, which the participants at the hearing should comment upon.

9.3.5 The impact of the projects of NBT

According to a recent evaluation of NBT⁸⁰ the main impact of the institution's work is the contribution to Norway's becoming aware of new technological challenges and help making evidence-based decisions on these issues, as well as promoting assessments to employ technologies in a human and environmentally friendly manner. The main findings of the evaluation are that NBT scores highly on capacity, competence and quality. The secretariat has high competence and credibility, a solid network, and high skills of communication, dissemination, and agenda setting. The NBT has repeatedly stood out by being proactive, putting current issues on the agenda, and contributing to matters being viewed from a wider societal perspective. The Board reaps a lot of positive feedback for their ability to communicate comprehensible presentations of the societal consequences and possibilities of technology.

⁸⁰ Source: „Evaluering av Teknologirådet” (2011) NIFU Nordic Institute for Studies in Innovation, Research and Education (Norwegian Only)

“Most of the topics of the projects in NBT are really relevant for parliament- says Alf Holmelid, member of Parliament-and maybe 30 percent of them is of great awareness by key people at the parliament”. For example the technology for help of elderly people is being discussed in parliament for the moment and there was another successful topic they brought up, the topic about children and internet.”

There is ample evidence that reports of the NBT are used in policy making. Several of the NBT’s advice and contributions have been included as separate points in white papers, Official Norwegian Reports and in the ministries’ work on the topics. There are also several examples of the work of NBT being used by the Parliament.

Examples are abundant especially in issues related to eHealth and telecare, nanotechnology, and privacy. Several of the projects have set the agenda for politicians and media. NBT have high ambitions for their dissemination activities, and work very actively with this. Most of the projects of NBT are published in national newspapers, news sites, and on TV. The visibility of the NBT in mass media and the public debate has significantly strengthened over the last years, however, regarding the broad thematic scope it is a challenging task to reach all potentially interested user groups.

An example is the project on eHealth, which in Spring 2011 was the main story of the front page of Norway’s biggest newspaper Aftenposten, with several follow-ups in the days after the launch. The Board’s Director also kicked off a debate for politicians and stakeholders on national television.

The project “You decide!” (teaching material on privacy and use of Internet) has been used by almost 1 million pupils all over the world. It started in Norway in 2007, and has since then been translated to 12 different languages.

The number of topics parliament puts on its agenda could be regarded as an indicator of success, as well as the hundreds of references parliamentary committees make to NBT’s reports. Another measure for success is if the government picks up on the policies assessed or if important newspapers discuss the topics brought up by NBT or the conclusions of the projects.

NBT’s contact person at RCN, Mrs. Veie also evaluates the institute positively: “I think the positive thing is that they are very good at picking interesting topics. They are good at getting very many interesting people in the board on their processes. I think one of the best, maybe better on this, involving more people in processes like different kind of stakeholders but belong to different parts of the society. The problems with that very often that is costly, time-consuming and the budget of the Board is not very large so they have to prioritise.

MP Alf Holmelid adds:” I think that their strength is in their way of work, having experts and bringing together experts and reaching rather quickly an overview of limited volume at a new topic, which is very useful for politicians. So I think that is a good thing, because politicians wouldn’t have time to read a big report anyway.

9.3.6 Criteria of success

A key element for success is the capital of trust NBT has built in the past decade. NBT makes all procedures and findings transparent and the documents publicly available.

Another important element of success is if the Board's work is applied by standing committees or party groups in the Parliament or its recommendations are cited in interpellations and propositions. A wide dissemination and discussion in the media is also often a sign of success. Mrs Veie, contact person for NBT within RCN is of the opinion that the Norwegian media fortunately is quite good in balancing between different views and the critical voices are heard as well.

It is one of the major strengths of the institution that they have the freedom derived from the independence to set their own agenda. Thus NBT has the initiative to introduce new items into politics. The difficulty of the task is to be relevant and interesting enough with every project put on the agenda to convince the political community of their usefulness.

Relevance of the projects is therefore a constant challenge, together with being embedded in the political system.

9.4 Case study: Regulating online gambling

The following case study was selected for presentation by the NBT staff. The topic was chosen for various reasons: the societal importance of the problem, the quality of the work within the expert group, and the outcome i.e. the content and the quality of the final recommendations, which was instructive and characteristic for a case where no ideal solution could be proposed.

Dr Jon Fixdal, scientific officer in charge of the project at NBT recalls: "This project was a success in several levels. First of all, we have an expert group, as on all our projects, on this project the expert group worked extremely well. They come from very different areas of society, areas of competence. They worked very well together, and managed to produce a quite valuable document in a short time. As a project manager, concerning the expert group, I was very-very pleased with that project, it was the best project I have ever run."

9.4.1 Selection of the topic

The topic, the problem of online gambling, leading too often to addiction, was initially identified by the secretariat of the Norwegian Board of Technology (NBT), who subsequently presented it to the Board as a project idea. The Board then discussed the idea and evaluated it according to some standard criteria (political relevance, distinct technology component, the need for political regulation etc.), and then decided to start a project.

Jon Fixdal, the manager of the project identifies the relevancy of the project: "there was a very big public debate about online gambling at that time. One of the reasons why online gambling became so hot on the political agenda was that we have these slot machines standing in lots of cafeteria, shops around Norway, then the government made a decision by the 1st of May of the year that all the slot machines will be removed. Lots of the people that were playing on slot machines would go around and start playing on the internet instead. So the timing of the project was very good, we received quite a lot of media attention the

days when we had finished the programme. There was quite an interest among a number of politicians, the broader gaming community, and in the media.”

During the initiation of project the key challenges were the following: to be able to see that the present topic (in this case: regulating online gambling) did raise interesting political issues, had a clear technology component, and it was necessary to have an idea about how the topic could be addressed through a TA-process. This part of the project did not require a high number of people, but it was a key element to be experienced in identifying and assessing potential projects. This is the reason why it was the secretariat that made most of the work in this phase.

The project was initiated because online gambling had been on a clear rise for a couple of years. At the same time the government had decided to ban “classical” slot machines in Norwegian shops, shopping malls and kiosks, as a means to reduce gaming addiction. This could have led to a further increase in online gambling, with a corresponding increase in addictive gaming behaviour. Regulations are a means to prevent addictive gambling behaviour, and the government had initiated a process on how to regulate online gambling. However, regulations are not only interesting as means to limit addictive gambling, but also because it raises more general questions about how Norwegian authorities may regulate activities on the internet and where the service provider (e.g. the provider of the online gaming site) is situated in another country where providing such services is allowed. Against this background the NBT found it interesting to assess different types of regulations and their relative merits.

9.4.2 Implementation of the project

The implementation of the project had the following main components:

- A **start-up conference** where representatives from Norwegian authorities, the gaming industry, experts on gaming addiction, and a former gaming addict debated various sides of online gambling, and the need for regulations.
- An **expert group** was formed to discuss the matter in depth. The Board of Technology’s expert group for the project Online Gambling consisted of: Christian Galtung, Kluge Law Firm; Marianne Hansen, Norwegian Institute for Alcohol and Drug Research; Britt Løkkheim, DnB NOR; Hanna Nilsson, Norwegian Poker Association; André Årnes, National Criminal Investigation Service; Tian Sørhaug, University of Oslo and Board of Technology; Jon Fixdal, Board of Technology (project leader). The expert group was a perfect mix of expertise from different domains: law, addiction issues, criminal experts, banking solutions experts while “the other side of the table” (the gamblers) was represented by the Poker Association.
- The expert group issued a **newsletter** to the parliament. The newsletter was presented to the standing Parliamentary committee for cultural affairs and to the Ministry of culture (who is responsible for legislation in this field).
- The newsletter was presented to the broader public at a **launch-seminar** where a panel of experts commented on the recommendations.
- **Media coverage** of the newsletter and the launch seminar, was also a key element, as a means to stimulate public debate on the issues addressed through the project. During the dissemination and the

launching of project report three persons in the NBT did the broader part of the job: the director, the project manager and the chief information officer.

9.4.3 Feeding in of results into the political decision making process

The results were presented to the responsible Standing committee in the Parliament, as well as the Ministry of culture (who is in charge of legislation on this area). The output document of the study presented a multiple choice approach for consideration to Parliament: three variations of legislative strategic approaches were described, together with scenarios developed from them. None of the proposed approaches presented a perfect solution to the range of problems; however, the scenarios gave an analysis of their pros and cons.

9.4.4 Political impacts

The political impact of the project is difficult to measure, but the project no doubt helped i.) put the need for regulation of online gambling on the agenda, and ii.) contributed to the public debate.

The Newsletter to the Parliament was referred to in the Bill (Ot. prp. nr.80 2007-2008) and during the subsequent Parliamentary debate on the proposal. The Government ended up with a regulation that prohibited Norwegian financial institutions from transferring money between the play and the gambling provider. In the Newsletter to the parliament this was not considered a very efficient regulation since it could be easily circumvented by use of electronic payment providers like Paypal, PayEx or Payson.

The Newsletter has also been referred to in subsequent parliamentary debates about gambling policies. Furthermore, it was referred to in a recent assessment of the regulation of online gambling. This evaluation was made by the Norwegian Gaming and Foundation Authority.

Political relevance is influenced by numerous factors including but not necessarily limited to: timing of the project vis a vis the agenda in the Parliament and affected Ministries, the ability to formulate politically relevant advice, and political negotiations in the Parliament and in government.

At the same time it should be emphasized that political impact can be difficult to measure. A project may, for instance, influence policy making by generating public debate (through media, in seminars etc.), and by influencing how policymakers think about a topic. This is a more indirect type of impact, but it should nevertheless not be disregarded. As mentioned above, the Government ended up with a regulation that the expert group assessed as problematic and thus did not recommend.

9.4.5 Successful elements and lessons learned

From an evaluative stance, it can be observed that:

- The expert group worked very well
- The assessment of the strengths and weaknesses of various regulations have proven solid.
- The project was welcomed by both the Parliament and the government, and used in Parliamentary deliberations on regulation of online gambling.
- The project received extensive media attention, thus contributing to public debate.

It is not evident how a greater impact could have been achieved. The success of a project does not depend on governmental regulations corresponding with the advice and assessments from an expert group. Policy

making normally results from broad and long lasting processes influenced by numerous factors, among which input from a TA process can be only one. It is the privilege as well as the responsibility of the parliamentarians and the government to make whatever decision they consider best. This decision may or may not coincide with the advice from a TA process, but the TA-process may nevertheless provide valuable insights to the policy debates prior to the passing of the legislation.

9.5 Future challenges for NBT

Technology and questions associated with it have growing importance for the whole society, therefore also for policy making. It has become generally acknowledged that the grand challenges of our societies cannot be solved without science and technology.

9.5.1 Demand for responsible research and innovation

Tore Tennøe, director of the Secretariat is optimistic about the future: “Technology is even more important than it was in 1999, because of climate change, information revolution – there is the knowledge society drive, because we need to reform the welfare state using technology, the securitisation is a lot about using technology. When I look in the papers, almost on every page I can see topics that we are touching on, in that respect I am optimistic. Most optimistic because I see that we have in a way found out how to really make impact, in a way that we do projects that are used by policy-makers, we are useful for the Norwegian society. I think it’s due to the fact that we are an independent institution, but also being an independent institution makes you vulnerable. So to predict how it will be, I’m not sure, but there is a respect and a really acknowledged need for getting technology questions discussed. The decision makers know they need it. Some way or the other in the EU level, whatever they call it, TA or foresight, which is quite a similar thing, or evidence- based policy-making or responsible research and innovation, there will be a need for getting independent or knowledgeable advice on how to cope with the 21st Century challenges.”

9.5.2 Institutional status and impact of projects

An important challenge for the future is to increase the status of NBT in the future-says Alf Holmelid, MP. “If they established a yearly meeting with one committee, it could give much more awareness. I have discussed before with them that maybe they should make a way for a yearly meeting with one of the committees in the parliament. The committees in the parliament are very specialised, because we have trade and industry, we have health, we have research, we have different committees. So I think the reason why it hasn’t happened so far is because it’s difficult to find one committee that matches the activities in NBT. So maybe they could have a yearly meeting with the committee of research, and then the Committee for Research could invite other committees depending on the topics. Also, the yearly meeting could introduce and raise the status of NBT to new MPs who are not familiar with technology-related problems.”

The challenges of the future are –according to Mrs Veie, contact person in charge of NBT at RCN- “to strengthen the impact toward of what they do in the society and to move forward. Participating in more debates in the open society arenas, organising more meetings, things like that. And also be more active in the Parliament and in trying to involve more parliamentarians in processes or in the interest groups, so that they get the impact to a larger community also in Parliament.” She stresses the importance and the strength of personal involvement: “I think the way of communicating what they found and what is at stake is correct, but they should involve more people in their communication processes, but also in the participatory processes. It has a very much higher impact if you are part of the process, by being involved in the process and you take it

much more on board in your own thinking than if you are told afterwards when the project is finished and its result is communicated.”

Matthias Kaiser, first acting director of NBT adds, that “the expertise accumulate so far could also be used in the European parliamentary technology assessment network, which is actually building up projects that are wider then only national projects so they are coordinating their activities with wider activities in Europe”.

9.5.3 Methodological improvements and developments

NBT staff are currently exploring the possibilities of doing participatory methods online and with social media tools. This could revolutionarise the methodology as well as expand the circle of people involved in the surveys by several orders of magnitude.

9.5.4 New areas of intervention

After the terrorist attacks in Norway July 22nd 2011, the Prime Minister has made calls for increased safety measures that do not infringe freedom and democracy. The Board has therefore established a project on security and openness that aims at providing Parliament and the Government input for tackling this challenge.

The Board will also continue its focus on welfare and care technologies, which are also included in the EU-project PACITA. In an ageing society, welfare gains will to a large extent rely on a wise and smart development of technology. Other planned projects include the future of power supply, medical self-testing and geo-engineering.

Chapter 10 Parliamentary TA in Switzerland⁸¹

Emiliano Feresin (TA-SWISS, Switzerland), Edgaras Leichteris (KEF, Lithuania), Adrian Rügsegger (TA-SWISS, Switzerland) and Danielle Bütschi (TA-SWISS, Switzerland)

10.1 The institutionalization of TA-SWISS

It was on a mild 4th October 1982 that the concept Technology Assessment (TA in short) was discussed for the first time by the Swiss National Council (the lower house of the parliament).⁸² René Longet, at that time a member of the parliament, demanded the government (Bundesrat), by means of a *postulate*,⁸³ to found a body “for the evaluation of the economic and social consequences of the technical and scientific innovations”.

10.1.1 Political momentum

On 2012 TA-SWISS celebrated twenty years of activity, but discussions about Technology Assessment in Switzerland go back thirty years. “There were a lot of controversial themes in 1970’s – like biotech and nuclear energy”, says now Longet. “Politicians believed that science was going to create new opportunities, and they wanted support from the people. I thought it was important to have a tool to weight the opinions. The main reason for the creation of a TA institution was to have an interface between opinions and facts”, he adds. Longet was aware that discussions about TA were ongoing in Germany and, despite not having input from the Swiss scientific community, which was quite passive, he went on with his proposal. Once the issue was given consideration, other parliamentary initiatives and questioning followed, but it took nine years till the government made concrete steps - the Swiss direct democracy has its rituals, which are time-consuming. “Nobody opposed the idea, the main problem was to have funding for such an institution”, explains Longet.

In the 1991 *Message for the Promotion of the scientific research*, the government commissioned the Swiss Science Council (Schweizerischen Wissenschaftsrat – SWR)⁸⁴ to report on the TA practices established abroad, describing positive and negative experiences. In that very message, the government pointed out that “Authorities, regulators and managers of scientific research (and technological development) as well as researchers must have the opportunity to count on the necessary knowledge to minimize risks and damaging impacts as much as possible: the aim being to set up the effective preventive measures, if possible already at the stage of the research design or before the conception of the technological development.”^{85,86} Thus the Swiss Science Council was assigned a four years pilot phase to establish the Swiss way to Technology Assessment, which started on 1992 with an allocated budget of one million Swiss francs (SFr.)⁸⁷.

⁸¹ Reporting is based on institutional archives and website, previous descriptions, interviews with stakeholders and ‘insiders’.

⁸² The National Council of Switzerland is the lower house of the Federal Assembly of Switzerland. With 200 seats, it is the larger of the two houses. The upper house, the Council of States, has 46 seats.

⁸³ A postulate is a formal request, which asks the government to analyze a certain question and to suggest measures if necessary

⁸⁴ The council is now called Swiss Science and Technology Council (Schweizerischen Wissenschafts- und Technologierat SWTR)

⁸⁵ Emil Kowalski: “Technology Assessment: Suche nach Handlungsoptionen in der technischen Zivilization”, vdf Hochschulverlag AG an der ETH Zürich.

⁸⁶ L'évaluation technologique comme enjeu politique. Histoire et développements en Suisse. Bericht des Zentrums für Technologiefolgen-Abschätzung, TA 12/1996, Longet René, Berne, 1996 - www.ta-swiss.ch/en/publications/1996/

⁸⁷ Ca. €0.82 million at the currency rate as of 16.12.2011: 1 Sfr. = 0.8190 €

In the first conceptualization of the Swiss Centre for Technology Assessment (TA-SWISS in short), the Swiss Science Council kept the idea of early-detection of the relevant issues, but stressed out that, for new technologies, it is of pivotal importance to know their potential positive and negative effects as early as possible. Besides, the possible negative consequences related to the abandon of a technology should also be taken into account. To serve all these purposes the Council put into operation an Office responsible for operational activities and a Steering Committee (SC in short) in charge of defining the strategic priorities, selecting the projects and ensuring quality criteria (see the paragraph *Quality control* and chapter 3. for more details on the Office and the SC activities).

The probation period of the pilot phase was successful: “The first reports convinced the government that TA is a useful tool, which contribution to the debate was to ‘clarify the issues’”, says Longet. Hence the government prolonged the assignment to the Council for four further years (1996-1999), with practically no changes in mission and scope of the institution. In the 1999 amendment of the law on research, the Swiss Science Council changed into the Swiss Science and Technology Council and Technology Assessment was mentioned for the first time in that law as a duty of the Council: TA was finally part of the Swiss federal law on scientific research. At the same time the government proposed to the parliament that TA-SWISS should become a permanent and independent institution within the new Council. It was also specified that the government, the Parliament and the Swiss community at large were the targets of TA-SWISS activities.

Finally, in 2007 a last change took place: with a new amendment in the research’s law, TA-SWISS got a new affiliation and from the 1st January 2008 it has become an independent competence centre of the Swiss Academies of Arts and Sciences.⁸⁸

According to Sergio Bellucci, head of TA-SWISS office since 1996, TA-SWISS underwent all these changes because there was a need from the Parliament to have a transparent, interdisciplinary and independent institution. “But the main idea which laid beneath these processes was to keep our independency”, he comments. Bellucci explains what kind of independence is important for TA-SWISS: freedom of choice on the budget allocation; freedom in the selection of TA-projects and TA-themes; no financial links with industry and NGOs “because they have their own interests and lobby activities that could influence TA-SWISS”. “At the beginning there was a tendency to have TA-SWISS very close to the parliament, but then it was decided that it's better to be totally independent: we have autonomy on the project, on the budget, on the issues, on recommendations”, explains Bellucci.

Bellucci also recalls a couple of episodes that could have possibly stopped TA-SWISS: in a 2005 motion, an MP of a right wing party proposed to abolish the institution. The motivation pleaded for the closure of TA-SWISS was that “TA-SWISS serves to the Federal Department of Home Affairs and to other departments as a lobbying tool to promote technical choices that are controversial at the political level. TA SWISS for instance has to flatten the road to the Federal Council in the field of the road pricing⁸⁹ or the genetic technology.” The proponent also stressed that TA-SWISS carried out political duties and should therefore be controlled by politicians. The Federal Council proposed to reject the motion and pointed out the independence of TA-SWISS and its essential tasks. That motion was not handled further by the National Council and decayed after two years.⁹⁰ But in 2009, during the vote for the Academies’ budget, the same MP proposed to turn down TA-SWISS (therefore saving its 1 million Francs budget), putting forward the claim that its tasks could and should be handled by the research centers responsible for innovation. Also in this

⁸⁸ www.swiss-academies.ch/en/index/Portrait.html

⁸⁹ www.ta-swiss.ch/verkehr/publifocus-road-pricing/

⁹⁰ www.parlament.ch/d/suche/seiten/geschaefte.aspx?gesch_id=20053369

case the Federal Council suggested to decline the proposal, which was indeed rejected by the National Council (100 votes against 51).⁹¹

The need for an independent institution has also been stressed by Emil Kowalski, physicist and former member of TA-SWISS Steering Committee.⁹² Indeed Swiss MPs and the government always acknowledged and promoted the independent status of TA-SWISS since the first pilot phase – with independence meaning “Distance from interest and pressure groups”, including the government itself and the parliament.

10.1.2 Actual institutionalization

According to the current federal law on research, the Swiss Academies of Arts and Science⁹³ are responsible for the management and promotion of the early detection of relevant themes in the areas of Education, Research and Technology (art. 9 of the research law, change in 2007).⁹⁴ In the subsequent agreement between the Academies and the Swiss Federal State the mandate of early detection of technological developments and of technology assessment is given to TA-SWISS, which is thereby also classified as independent organisational unit within the Academies.⁹⁵ Some consider this affiliation not always positive: “The current positioning of TA-SWISS under the umbrella of the Academy of Science is somehow downgrading: they are too deep inside the bureaucratic tree, they have to respond to many entities, there’s a risk to lose the direct connection to the State”, says René Longet.

TA-SWISS is now the centre of competence for Technology Assessment in Switzerland. Formal tasks and duties of TA-SWISS are specified within the *Message for the Promotion of Education, Research and Innovation for 2008 – 2011*, attached to the 2007 research law amendment: “The principal purpose of the technology assessment consists in delivering to the parliament and the government analyses and recommendations on politically relevant technology subjects. New and controversial technologies will be examined with respect to their social, ecological, economic, juridical and ethical effects in a way as broad and independent as possible. TA-SWISS fulfils this mandate by means of expert's studies and participatory procedures (co-operation procedure with the population in the form of PubliForum, publifocus and PubliTalk). The interdisciplinary studies and the related abridged versions are directed to the decision makers in politics and economy as well as to the wide public. The same is valid for the recommendations and results from the participatory procedures.”⁹⁶ Another task of TA-SWISS is indirectly assigned in the research law: “They (N.B. the Academies) frame the dialogue between science and society with the primary aim of promoting a mutual understanding of these two entities by means of especially TA studies as well as by suitable information and dialogue events”.⁹⁷

An explanation for such a mandate with a dual kind of activities (expert studies and participatory procedures) comes from René Longet: “Switzerland is a country where broad participation is usual, for direct democracy here is an important thing. Then our model has to be: TA as instrument for the government AND for the people”. On the same wavelength is Kowalski: “To accept the foreign models of TA without criticism would

⁹¹ www.parlament.ch/ab/frameset/d/n/4812/314116/d_n_4812_314116_314136.htm

⁹² Emil Kowalski: “Technology Assessment: Suche nach Handlungsoptionen in der technischen Zivilization”, vdf Hochschulverlag AG an der ETH Zürich.

⁹³ www.swiss-academies.ch

⁹⁴ www.admin.ch/ch/d/ff/2007/1447.pdf

⁹⁵ [www.ta-swiss.ch/?redirect=getfile.php&cmd\[getfile\]\[uid\]=1243](http://www.ta-swiss.ch/?redirect=getfile.php&cmd[getfile][uid]=1243)

⁹⁶ www.admin.ch/ch/d/ff/2007/1223.pdf

⁹⁷ www.admin.ch/ch/d/ff/2007/1447.pdf - This task is formally given to the Academies in Art. 9 (par. c), but then there is a clear agreement between the Academies and TA-SWISS to consider. That agreement gives TA-SWISS the mandate of doing technology assessment (see first paragraph of 10.1.2 and footnote 64),

not be right, in view of the Swiss peculiarities (numerous federal structures, consociationalism,⁹⁸ established structures of consultation in pre-political areas – like referendum)...the activities of TA-SWISS aim at the legislative counseling, through both classic explorative studies and modern participatory methods”.

Although the main target of TA-SWISS activities are the Swiss Parliament and the Swiss government, the relationship between these entities is not formally regulated. The government is not obliged to react on the institution’s reports, not are these reports included by default on the agenda of relevant parliamentary committees. Nonetheless the government chooses sometimes to cite a TA-SWISS report within its messages to the parliament (e.g.: in a message concerning the federal law on the research on human beings, the TA-SWISS PubliForum *Research on human beings* (2004) was cited).⁹⁹

TA-SWISS maintains this formal distance from politics, and in general a continuous aspiration for independence, in the whole organisation of its activities. In a similar way to the Dutch Rathenau Instituut, financing doesn’t come directly from the government (see next section), but goes through the Academies. In-charge politicians are not anymore admitted in the Steering Committee. Since 2008 a federal law bans members of the federal authorities to exercise simultaneously several activities within federal financed bodies, hence only former MPs are accepted in the TA-SWISS SC.

Also the choice of third party funding bodies is based on the dogma of independency, in fact no funding from industry is accepted. “When you discuss technology with citizens, questions are raised immediately: who is financing this study, who is behind it, whose interests are defended, is it industry financed?”, says Bellucci. Credibility, he adds, comes from good reports made by an independent institution. Longet is even more categorical: “The main characteristic of TA-SWISS is independence – non-independent TA is useless”, he says. Martin Buechi, head of the section *Scientific and juridical basis* at the Federal Office of Public Health FOPH, and Kathy Riklin, Swiss MP and member of the *Committee for Science, Education and Culture* of the National Council, are both potential targets of TA-SWISS activities and back the importance of independence for the organisation too.

10.1.3 Financing

TA-SWISS is funded by the Swiss Federal Government via the Academies. It’s the State Secretariat for Education and Research that proposes the budget for the Academies, TA-SWISS and other institutions, then the proposed budget it’s approved or rejected by the Parliament – this procedure takes place every 4 years. The allocated public money consisted steadily in one million SFr. since the formation of TA-SWISS till 2009. Funding grew up to 1.1 million SFr. in 2010 and 1.2 million SFr. in 2011 (€0.9 million and €0.98 million respectively). This increase was mainly due to the fact the TA-SWISS was no longer member of the administration, and had thus to cover its overhead from its own budget. In 2012 the budget reached 1.4 million SFr. (€1.15 million). State funding is still the highest premise today and allows for the basic financing of TA-SWISS, but is also a weak point of the center. “I think what influences the impact is the budget - with only 1 million SFr. it’s difficult to have a big visibility”, says Longet, which also considers this small financial basis a possible danger for the future survival of TA-SWISS. “Our budget, if we compare it with other institutions, is too small”, admits Bellucci.

⁹⁸ Political scientists define a consociational state as a state which has major internal divisions along ethnic, religious, or linguistic lines, with none of the divisions large enough to form a majority group, yet nonetheless manages to remain stable, due to consultation among the elites of each of its major social groups. Consociational states are often contrasted with states with majoritarian electoral systems. (Source: Wikipedia)

⁹⁹ www.admin.ch/ch/d/ff/2009/8045.pdf

Occasionally, on specific projects, third-party funding takes also place, but only in form of public money. Funding bodies can be administration departments, such as the Federal Office for the Environment FOEN, the Federal Office of Public Health FOPH or the Commission for Technology and Innovation CTI or other state-funded organisations like the Swiss Academy of Medical Sciences. But industry, commercial companies and the private sector in general cannot support the projects. External sponsorships, which usually don't exceed twenty to thirty thousand Francs per project per year (a project has a funding of 140 thousand SFr. - €115 thousand), can reach a total of ca. 80 thousand SFr. per year.

10.1.4 Quality control

TA-SWISS project managers are the “front men and women” in quality control: they weight potential TA subjects, they deal with expert studies or participatory methods, they count on their experience in the chosen field and on given guidelines for the projects to steer the project group in the good direction. The office managing director is the person who has the biggest responsibility in the office concerning quality control of projects: he supervises birth, development and conclusion of each activity.

But it's the Steering Committee (SC) that has the last word on the quality of a TA-SWISS activity, being it a proposal for a project, a communication activity, a final report that has to be published. In short, the Steering Committee is responsible for the strategic management, and its duties include:

- Defining key subject areas
- Defining project design and research questions
- Selecting project authors and collaborators
- Approving budget allocation for the projects
- Selecting members of the support group (called either expert or accompanying group)
- Approving reports
- Staying in contact with politicians and organisations

The Steering Committee groups together 10 to 15 members from various backgrounds, but mostly from the Swiss science and technology community: scientists, economists, sociologist, representatives of associations and NGOs, former politicians (as said above, in-charge politicians are not admitted in the SC). Since 2008 it has been decided that the Board of Directors and Delegates of the Academies chooses each member of the Committee and the president thereof. Their mandate last four years and can be renewed twice. Current President of TA-SWISS SC is Fulvio Caccia, a former member of the Swiss Parliament. Within the Committee sit also some guests, representatives from public institutions with no voting right. A list of the current members of the Committee can be found on TA-SWISS website.¹⁰⁰

Other forms of quality control intervene at various stages of the project development. A preparatory group of external experts can be called upon to give a non-binding evaluation on a project idea and the extent of the relative subject before being proposed to the Steering Committee. An accompanying group consisting of 10 to 20 experts with diverse professional competence – and two members of the Steering Committee - is formed specifically to accompany the progress of each project: it reviews its concept and the preliminary and final reports in order to ensure quality and well balanced presentation of the subject. Anyway, each final decision rests with the Steering Committee.

¹⁰⁰ www.ta-swiss.ch/en/ta-swiss/steering-committee/

Quality criteria, like the following standards for content, have to be taken into account before any report publication:

- Completeness of the results (measured on the assignment, i.e. the research conditions set in the contract, possible decisions of the experts' group)
- Intelligibility and traceability of the statements, transparency of the deductions
- Balance and independence
- Academic nature (from the point of view of method and content)
- Reference to the addressees and practical orientation, feasibility of recommendations

Periodical external evaluations of the TA-SWISS activity are also in the agenda – two of them have been performed so far (1996 and 2002).

The first evaluation was requested by the government to assess the TA-SWISS work at conclusion of the pilot phase and was conducted by three experts from established TA institutes in the world.¹⁰¹ They performed the evaluation by means of internal self evaluation, interviews with internal personnel and external experts, review of reports, etc. They found out inevitable "childhood problems", mainly due to obvious difficulties for beginners dealing with TA from scratch and to the modest personnel and financial resources. Without putting into question the need for an independent TA in Switzerland, the evaluators focused on the following issues:

- the need to target both the parliament and the public
- related to the targeting of the public: the need to strengthen the media activities and to start the participatory methods (with the aim to involve the citizens in the political debate at an early stage)
- the need to write easy to read and attractive reports (and to implement an Italian version of the short summaries for the important reports)
- the need to implement standardised procedures, for subject choice, choice of the project groups and accompanying groups, etc.

In 2002 TA-SWISS decided it was time for a new evaluation and assigned the task to the company Evaluanda.¹⁰² "We decided to choose a company because we needed a professional work, also to avoid an evaluation made by TA experts that are often collaborators of TA-SWISS and could have conflict of interest", explains Bellucci. Besides using the methods of the first evaluation, Evaluanda conducted a documentary enquiry by means of a questionnaire survey involving some 200 actors and privileged observers of TA-SWISS activities, and simultaneously undertook three case studies. They finally weighted the TA-SWISS work by means of a SWOT analysis.¹⁰³ Principal findings were the following:

- an absolutely remarkable productivity and growth – in terms of both quality and quantity – of TA-SWISS activities (despite the backdrop of not only a certain institutional stabilisation, but also a stagnation of resources)
- development of its activities in the domain of communications and public relations
- an increased appreciation of the work performed by TA-SWISS among its principal public target-groups, notably the Parliament, the Federal administration, and the major scientific organisations

¹⁰¹ J. C. M. van Eijndhoven, former Director of the Rathenau Institute, Den Haag, The Netherlands; Ernest Braun, founding director of ITA, Vienna, Austria; Bill Westermayer, OTA, USA

¹⁰² www.evaluanda.ch/

¹⁰³ A strategic planning method used to evaluate the Strengths, Weaknesses/Limitations, Opportunities, and Threats involved in a project or in a business venture. (Source: Wikipedia).

(even though this audience remained relatively limited and reserved, TA-SWISS being largely absent from the private sector and barely involved with NGOs)

- weaknesses in its present organisational structure, for instance in the procedure used for identifying the topical issues for its projects
- main recommendations were: to establish a strategic plan for development for the years to come (in order to avoid the risk of confusion and dispersion of resources, which can take place when a small structure confronts itself with many activities and many requests from outside); to intensify efforts concerning diffusion and communication

The next evaluation should take place in 2013. Decisions on its execution will be taken by the Steering Committee.

10.2 Institutional context of TA-SWISS

Switzerland is a small country, but the scientific and technological panorama is highly developed with two Federal Institutes of Technology, ten universities, the European Organisation for Nuclear Research (CERN), many specific research centers and high level schools.¹⁰⁴ The country expenditure for R&D reached 2.9% of the GDP in year 2006 (a number that ranks Switzerland among the top ten countries worldwide). Three quarters of that expenditure come from the private sector: Switzerland hosts a huge number of pharmaceutical, chemical, and engineering industries, many among them are multinational companies. The R&D sector is surrounded by advisory bodies, associations, think tanks, foundations and many NGOs. Given this wide and dense scientific and technological panorama, there's no wonder that being noticed is not an easy task: "Impact of TA-SWISS? They have some impact, but it's a very difficult question - there are so many organisations!", comments Kathy Riklin, Swiss MP, member of the 'Committee for Science, Education and Culture' of the National Council.

10.2.1 Relationship with stakeholders

TA-SWISS pursues informal and formal contacts to the MPs through its office director Sergio Bellucci and the President Fulvio Caccia (who is a former MP). Within the various legislative committees of the Parliament, main targets are the members of the *Committee for Science, Education and Culture*, the *Committee for Social Security and Health*, the *Committee for the Environment, Spatial Planning and Energy* and the *Committee on Transportation and Telecommunications*.

TA-SWISS involves many stakeholders in its activities. In twenty years of work, the centre developed a big network of contacts from all walks of life: administrative bodies like the Federal Offices, industries, associations, NGOs, scientists and journalist are also targets of TA-SWISS. Scientists are usually the main actors when it comes to the making of reports and projects. After a period of indifference during the years that lead to the institutionalization of TA-SWISS, researchers started to discover the added value of an interdisciplinary research on new technologies. Nowadays TA-SWISS has a lot of connections within the scientific community. "Generally speaking we have good relationships with the scientists. Clearly there are still people that don't know us or that don't like us, but this is part of our work", says Bellucci.

Stakeholders are reached through a newsletter (which is published quarterly), personal invitations to workshops and events, regular information on the centre activity, a website, and recently also Facebook.

¹⁰⁴ www.swissuniversity.ch/index.htm

Reports summaries are freely available for download from the website, while the full reports are on sale, usually through the Vdf publisher.¹⁰⁵ Since 2011 readers can freely access the latest publication through open access, via the same publisher mentioned above.

Stakeholders take also part in the Steering Committee of TA-SWISS, in the accompanying groups of single projects and in the participatory projects (see also chapter 3).

10.2.2 Relationship with other TA and TA-like activities

“We are a small country, there is no place for other TA institutions!”, says Adrian Rüegegger, long-time project manager at the TA-SWISS office. His opinion has indeed some foundation. There are many organisations in Switzerland but no one makes parliamentary TA as TA-SWISS does, even the closer ones bear big differences. It’s the case of the foundation Risiko-Dialog, which is based in St. Gallen: “The Risk Dialogue Foundation brings together different stakeholder groups in order to discuss risks of today's society. The aim is to increase societal competence in the judgement and handling of risks. The Risk Dialogue Foundation has nearly 20 years of experience in the observation, analysis and moderation of risk debates, as well as in consultancy in risk communication”, states the website.¹⁰⁶ Its activity is more oriented to the creation of dialogue platforms and networking, but apart from that “The main difference is that they get also money from the industry - insurance industry. They are doing a good job, but there could be a problem with independency and interpretation I think”, comments Sergio Bellucci. Empa, the Swiss Federal Laboratories for Materials Testing and Research for Industry, Construction and Commerce,¹⁰⁷ is a federal institution, that sometimes deals with assessment themes, by the Environmental Risk Assessment and Management Group (ERAM) for example. But in this case, like for other research institutions or universities that occasionally tackle an issue from a multi-faced perspective, the broad interdisciplinary approach of TA-SWISS is missing – for example a project misses the ethical discussion, or fails to consider the economic repercussions.

Interconnections with such organisations take place at a different level. Both Empa and Risiko-Dialog applied to several call for tenders of TA-SWISS, where they proposed themselves as project leaders within a consortium aimed at doing an experts’ study – and it also happened that the project was commissioned to them. Their members can also be part of the TA-SWISS Steering Committee or expert groups – in the latter only if they are not doing the project themselves. Furthermore there are ongoing collaborations among the communication officers: the institutions exchange information, build up networks, support each other when organizing events that are of mutual interest. The same kind of connection takes place with Innovation Society, a consulting company on nanotechnologies.¹⁰⁸

TA-SWISS maintains good relationships with the two Swiss Ethic Councils: the National Advisory Commission on Biomedical Ethics¹⁰⁹ and the Federal Ethics Committee on Non-Human Biotechnology¹¹⁰. These two councils make projects and cover specific themes from the ethics perspective, without having a TA approach. But they sponsor TA-SWISS projects that consider interesting, they participate with their experts in the accompanying groups of some projects, they could act as external consultants for ethical issues being addressed in a project.

¹⁰⁵ www.vdf.ethz.ch/

¹⁰⁶ www.risiko-dialog.ch/Overview%20in%20English

¹⁰⁷ www.empa.ch/

¹⁰⁸ www.innovationsgesellschaft.ch/

¹⁰⁹ www.bag.admin.ch/nek-cne/index.html?lang=en

¹¹⁰ www.ekah.ch/en/index.html

In Switzerland there are several bodies promoting dialogue between Science and Society: Interface science-société of the University of Lausanne,¹¹¹ the four single academies associated with the Swiss Academies, the Foundation Science et Cité (which is also a centre of competence of the Swiss Academies of Art and Sciences)¹¹² and Treffpunkt Science City at ETH Zurich,¹¹³ they all have outreaching programs. Between the communication officers of TA-SWISS and the four academies there's a continuous exchange. They discuss on communication strategies which could be of mutual interest, cooperate on media releases, organize science cafes (for example a public event based on the TA-SWISS theme *Human Enhancement*¹¹⁴ was organized together with Science et Cité in 2012). Similar interactions occur between TA-SWISS and Interface science-société: a science café on the TA-SWISS project *Digital Natives*¹¹⁵ took place in 2011; the itinerant exhibition *Nano-technologies: products, promises, worries*, which took place in 2011-2012 and was organised by Interface science-société, was partially sponsored by TA-SWISS. Independency of opinion remains the primary requisite for a TA-SWISS involvement in all these interconnections.

TA-SWISS is member of the European Parliamentary Technology Assessment Network EPTA¹¹⁶ and collaborates sometimes with the Science and Technology Options Assessment STOA, the TA organ of the European Parliament (e.g.: STOA translated in English the study *Nanotechnology in the food sector*, to make it available to the EU Parliament).¹¹⁷ TA-SWISS is also a founding member of the German speaking Network NTA, the association of technology assessment institutions and practitioners in Germany, Switzerland and Austria.¹¹⁸ Within this association TA-SWISS organizes meetings and workshops, and hosted the 2012 NTA conference.

10.2.3 Reflection on the institution's niche

Political role

The idea behind the creation of TA-SWISS was a number of controversial issues related to new technologies, which arose in the 1970s' (like biotechnologies, nuclear energy and similar). It created the need for an independent and qualified institution, able to reflect on different issues, especially those connected with society. During years of activity, the institution had to defend its right to exist and each time several factors have played an important role providing the immunity to "attacks": independence, impartiality and quality of work. Political role is changing depending on the topic, the structure of the Parliament and quality of personal contacts with politicians interested in particular topics, but in general it can be described as friendly, although with polite distance. At the early stages of TA-SWISS the Parliament members were allowed to be in the Steering Committee of this institution. Probably that condition allowed to have closer contact and bigger impact on advisory role. That's reflected in the interview with René Longet, former MP and former member of SC. At the moment there is a need for closer relationships with the Parliament, which is reflected in the interview with present MP Kathy Riklin and interviews with insiders.

More opportunities exist in developing personal contacts with MPs. At the moment it's more the role of the director to keep such contacts, but involvement of experts and project managers in direct discussions with MPs may have a positive effect. This might need the development of networking and communication skills

¹¹¹ www.unil.ch/interface

¹¹² www.science-et-cite.ch/

¹¹³ www.ethz.ch/news/treffpunkt/index_EN

¹¹⁴ www.ta-swiss.ch/?uid=119

¹¹⁵ www.ta-swiss.ch/en/projects/information-society/internet-of-the-future/

¹¹⁶ www.eptanetwork.org/

¹¹⁷ www.europarl.europa.eu/stoa/about/default_en.htm

¹¹⁸ www.netzwerk-ta.net/

of staff, mentors and even experts. Main barriers are limited resources and financial base. These create challenges in choosing the topics (specialized and technocratic vs more general and societal), expanding communication and impact on society, having more influence, providing better mentorship and support to experts working on the studies.

Societal role

The environment in which TA-SWISS operates is a country with strong democratic traditions and a vivid political debate within society – which discusses topics such as the societal impact of technologies and the return on investments from them. The consensus building tradition is deeply rooted into the political system and in the society. Whereas NGOs play an important role, politics are also influenced by strong business lobby groups (in particular - multinationals). In such context the role of TA-SWISS is concentrated on provision of good material for public discussions and decision-making, rather than initiating debates. TA-SWISS looks more like an independent advisory body with an analytical approach (supported by external experts) than a facilitator of public debates.

The *niche* of the institution is its independence. Such niche is strongly expressed in the views of different stakeholders during all interviews. It means that such niche not only influences the activities and work organisation within TA-SWISS, but that there is a strong agreement between main stakeholders at different levels on the added-value provided by TA-SWISS. The independence as it is understood by stakeholders (external and internal) mainly reflects financial independence (for example "no money from the private sector").

The niche of independence has an impact on the balance *independence vs partnerships* and prevents proactive engagement in coalitions, partnerships and networking. There is a good, friendly and non-competitive environment that includes relationships with other similar think tanks, but there are also a lot of possibilities and opportunities to involve more interest groups and partners in the TA processes and to have better influence on political and societal opinions and decisions. It remains to be seen if and how these opportunities could influence the strive for independence that characterizes TA-SWISS.

10.3 Organisation of work at TA-SWISS

TA-SWISS primarily monitors the developments of new technologies in the following fields: biotechnology, energy, medicine, nanotechnology, communications and information technology. But the centre is also interested in “social technologies”, i.e. the instruments that have been developed by social and human sciences. In the last ten years the centre worked on more than 35 projects and many more publications.

10.3.1 Organisational structure

As mentioned above, the operational and managerial body of TA-SWISS is the office team, which is based in Bern, while the Steering Committee is responsible for the strategic management. These two entities interact close with each other, since the Committee has to approve virtually every significant step of the project management. The SC and the office meet from four to six times a year. In between, there is constant contact between the office and the Committee President, who also takes part in the two-monthly internal meetings of the office.

The TA-SWISS office team is relatively small and has basically four internal departments: the operational management, which refers to the office head; the project management personnel, which takes responsibility

of the projects, from the monitoring activity to the final publication of the results; the public relations department, which takes care of media activity, organisation of events, publication of TA-SWISS products; finally the administration and finance department.

The office employs seven people, including one director, three scientific staff members, one public relations manager and two administration and finance members. In addition there are two external collaborators, which function as project managers. Most of the people are employed part-time and have more than one specialization in their background. The personnel spans a wide range of expertise, from arts and philosophy to biology, chemistry, political sciences, agronomy, geography, communication, sociology.

The project's work is mainly organized through external contracting. This is always true for the interdisciplinary studies, while the participatory methods are usually managed in-house. In the case of studies the responsible person manages the project work with the external project group, but does not do the research work: he or she monitors scientific developments, proposes subjects that could be of TA interest, writes the preliminary report that leads to the call for tenders, organizes meetings with the project group and the accompanying group of experts, follows the publication procedures and helps with the editing of the abridged versions of the reports. In the case of the participatory methods the work is carried out in-house, from setting the concept of the meetings, to organizing the agenda, to the writing of the report or the conclusive publication.

The personnel is directly involved in projects that are conducted within the different networks of TA-SWISS (EPTA, NTA), or when TA-SWISS takes part as partner in EU or international projects like e.g. PACITA or WWViews on Global Warming.

10.3.2 Priority setting

The TA-SWISS office selects TA-interesting topics and proposes them to the Steering Committee, even though the latter can also do it. As Adrian Rügsegger explains, the team “looks for interesting themes through monitoring literature, newsletters, websites, newspapers, meeting with people, monitoring what other TA institutions are doing”. A new technology, or even an established one that has a new spin, is interesting if it's expected to have some significant impact on the Swiss society, in particular on economy, societal habits, environment, health, legislation, etc.

Once a staff member finds a topic that could deserve more attention, he/she explains the topic to the whole staff during a meeting or even in a less informal discussion. If the theme is considered interesting “we write down a short proposal (two pages) on the subject, that we bring for approval to the Steering Committee”, adds Rügsegger. If the Committee approves, the person in charge can dig into the subject, making a detailed paper on it (10-15 pages). At this stage the project manager usually decides, after consulting the office, to discuss the topic within a small group of experts, with the aim of finding the important issues and better define the subject matter limits.¹¹⁹ The final paper describing the state of the art of a new technology is brought to the SC for final approval, which then leads to a call for tenders. After the call is closed, the offers received by the TA-SWISS office undergo a three stage selection: the office makes a first internal selection based on general criteria (the offer has to comply with given guidelines, it has to fulfil the call's requests, it has to be well written and organised, etc.); then the office contacts a group of experts in the call's field and asks for their evaluation; finally a short list of selected offers (usually 3 or 4) is proposed to the Steering Committee for a final decision. The budget for a study is about 140 thousand SFr. (€115 thousand), and a

¹¹⁹ Preparatory discussions with experts have become a standard procedure within TA-SWISS. They can also be requested by the Steering Committee.

study usually lasts one year and a half. The whole procedure, from topic finding to offer selection, is regulated by internal guidelines.

The way to participatory methods projects is more straightforward. Since there's no need for a call, the office can start immediately working on the subject, once it has been approved by the SC.

The annual and strategic working agenda is defined by the head of the office in accordance with the SC and its president. Determining factors in the decision of pursuing a subject are the budget and the person months at disposal. With the current means, TA-SWISS cannot afford to follow more than 4/5 projects at the same time. In compliance with its mandate TA-SWISS gives absolute priority to TA interdisciplinary studies and participatory methods, other projects (like international ones) are also important, but are lower ranked in the priority list of the centre – except when these projects receive external funding such as EU funding.

10.3.3 TA approaches

According to its mandate TA-SWISS is an advisory body of the Parliament and the Federal Council (the government), and fulfils that by means of experts' studies and participatory procedures. Given this starting point and also the specificity of Switzerland in terms of direct democracy, which TA-SWISS takes into consideration, the centre can be defined as a mixture of research, participation and communication, where with the term "communication" also the advisory function is included. All the stakeholders and members of staff interviewed recognized the advisory function of TA-SWISS as the main one. René Longet says that TA-SWISS is a research institute, that should act more as a counseling body.

Usually, when a technology is new and there's little knowledge about it, also about the relative TA-issues, the method of choice is an interdisciplinary TA study: this implies a broad analysis of the technology and the related social, ecological, economic, juridical and ethical effects. A study can contain different methodologies: from literature collection and analysis, to interviews with stakeholders, to specific methods from the social sciences, to more scientific approaches. "Sometimes we are specific in terms of methodology already in the call, but the methodology is usually proposed by the applicants within their offer", explains Bellucci.

Social and cultural oriented Technology Assessment projects (so called SoKuTA technology Assessment)¹²⁰ are a different kind of study. In a classic Technology Assessment study the societal aspects of a technology are always taken into account, but a SoKuTA project focuses on societal changes or innovations that cannot be defined as technology in short - but are nonetheless analysed with a TA approach. Subjects can come from the labour market (e.g., administration), from everyday life (e.g., elderly) or from the innovation (e.g., economy): examples could be the increased use of indicators in society or changes in the taxation system that aim at financing renewable energy forms or new roads. To treat such practical questions, a social-scientific and culture-scientific knowledge is demanded. Opportunities to make this kind of studies are much rarer, so far only one has been done (*Indicator-based decision-making systems*).

Participatory processes are the third kind of approach that TA-SWISS adopts. They enable the gathering of citizens' opinions and arguments on controversial themes related to a technology which is already established. As Bellucci points out, "with no background knowledge it's very difficult to have participatory methods". These methods have been implemented in TA-SWISS since the late 1990s' to fulfil the population

¹²⁰ www.ta-swiss.ch/en/projects/social-and-cultural-ta/

need for direct participation in the political discourses on technologies. TA-SWISS uses three participatory models: publifocus, PubliTalk, PubliForum.

A publifocus is modelled on the focus group approach: three to four events with different participants (ca. 15 randomly selected), each around four hours long; discussion of various questions concerning a selected topic; preparations for discussions on a topic on the basis of an information brochure and introductory presentations with stakeholders and lobbyists; moderation; final report written by a journalist or a TA-SWISS project manager.

PubliTalks are similar to publifocus but easier to handle procedures, intended to young generations: a personal story functions as a peg in a cycle of three short meetings with students aimed at discussing more general issues related to science; also here the final report is written by a journalist or a TA-SWISS project manager.

The participatory method known as PubliForum is based on a model developed in Denmark, known as the *consensus conference*, which was adapted to the particular requirements of Switzerland, particularly to its linguistic diversity. The main actors in a PubliForum are the members of the Citizens Panel, approximately 30 in number, who have expressed their willingness to dedicate about ten days to discovering a theme heretofore unknown to them, to dialoguing with experts in the field and with their fellow citizens, and to authoring a written report on their hopes, fears, and recommendations. The PubliForum was the first participatory method to be used by TA-SWISS, the first PubliForum took place in 1998.¹²¹

The choice among these methods depends on the scope, the budget, the target and the time at disposal - clearly PubliForum are more demanding with respect to the other two methodologies. “This number and type of participatory methods allows TA-SWISS to cope with different situations, that is to adapt ourselves to the various TA-questions and to our budget constrains”, explains Sergio Bellucci.

Workshops and public debates (like Science cafés) are two other types of “light” participatory methods, which are organized when the topic does not fit into other options but deserves anyway to be highlighted.

10.3.4 Overview of projects and output

In the last three years TA-SWISS dealt with the following projects.

Studies (interdisciplinary scientific analyses):

- Nanomaterials: Effects on Environment and Health (foreseen conclusion 2013)
- Opportunities and risks of electromobility in Switzerland (foreseen conclusion 2012)
- Robotics and autonomous devices in health care (foreseen conclusion 2012)
- Localisation Technologies (2012)
- Human Enhancement (2011)
- Biomass fuels – second generation (2010)
- Indicator-based decision-making systems (2010)
- Nanofood (2009)
- Anti-aging medicine – myths and chances (2008)

¹²¹ PubliForum «Electricity and Society» -
[www.ta-swiss.ch/?redirect=getfile.php&cmd\[getfile\]\[uid\]=1068](http://www.ta-swiss.ch/?redirect=getfile.php&cmd[getfile][uid]=1068)

Participatory projects (consultations aimed at gathering the views of citizens):

- PubliTalk «Digital Natives» (2011)
- Dialogue «The Internet and me» (2010)
- World Wide Views on Global Warming (2009)
- publifocus eHealth and the electronic patient file (2008)

Other projects (international projects or workshops):

- Experts' Workshop on Cloud Computing (2011)
- EPTA Project on Genetically modified plants and foods (2009)

Research and fact finding

All the interdisciplinary studies aim at finding facts and having a balanced assessment of chances and risks of new technologies. Research is organized through external contracting by means of open calls for tenders. The communication of a call is made through the network of TA-SWISS contacts: newsletters, direct mailing of known researchers, publication of the call in the TA-SWISS website and in the websites of befriended institutions (e.g.: the Academies).

Main results of a study are a written report in form of a book which includes recommendations for the policy makers and an abridged version of the study, written in a journalistic and easy to understand style. After the publication, these results are communicated through various means: media conferences for print and other media; communication to the MPs, through direct contact and presentations at commissions, fractions and Parties (for details see chapter 2 – Relationships with stakeholders); public discussions (e.g.: open discussion on Nanofood in collaboration with the newspaper Tages Anzeiger); public conferences (e.g.: *Rise of Sentient Machines? Robot Compaions for Citizens*, in May 2012); workshops for stakeholders and politicians (e.g.: *Human Enhancement*); workshop for media and stakeholders (e.g.: *Indicator-based decision-making systems*); TA-SWISS-Newsletter; TA-SWISS-Website; articles in magazines, written by TA-SWISS (examples of publishers: ITbusiness, Suchtmagazin, newsletter of the Swiss Academies of Sciences, etc.); articles, written by journalists in specialized magazines, newspapers (NZZ, Tages Anzeiger, Le-Temps) and newsletters (but not paid by TA-SWISS); speeches and presentations of TA-SWISS members of staff in conferences and events.

Stimulating public debate and participation

Besides a targeted public relations activity with the media, which entails the publication of the reports and other main activities (see paragraph above for some examples), TA-SWISS stimulates public debate through its participatory methods publifocus, PubliTalk, PubliForum, and the organisation of workshops. Main results of the participatory methods are information brochures (for the meetings participants) and reports (aimed at MPs, with conclusions and recommendations), whereas short reports and/or factsheets are the output of the workshops. TA-SWISS organizes public events to reach a broader public: the project *Dialogue "The Internet and me"* was presented at a public meeting, where the project participants presented their recommendations and discussed them with politicians and stakeholders (ca. 70 attendees); the PubliTalk *Digital Natives* was discussed during a Science Café in Lausanne. The website (3000 – 4000 visits per month), Facebook (125 friends as of August 2012) and the quarterly Newsletter (5400 print editions + 2100 electronic mails for direct contact) are other debate-adjuvant means.

Influencing political decision-making

Since there is no formal obligation for politicians to take TA-SWISS products into consideration, the impact on politics depends on TA-SWISS effort and on external (political) factors (political framing and opportunity

which cannot always be predicted beforehand). “The TA-SWISS office is the active actor in this process”, says Susanne Brenner, former communication manager, “you need a lot of initiatives to get parliamentarians’ attention”, she adds. The resulting approach to the target is multi-faced: TA-SWISS seeks personal and formal contacts (see chapter 2 – Relationship with stakeholders); the MPs receive regular info on TA-SWISS activities through the Newsletter (they are also invited to write editorials for it) and through mail or letter contact when a project is published; targeted MPs are invited to public events related to specific reports – possibly giving them the opportunity to give a speech.

One of the main goals of TA-SWISS attention-catching activity is to get invited to a parliamentary commission discussion. Hence standing monitoring of the parliamentary activities takes place: the office tries to get attention from each commission that plans a discussion on a topic related with a TA-SWISS study, “or at least we ask the commission’s secretary to include our study within the documents aimed at that commission’s meeting”, says Brenner. The TA-SWISS study *Nanofood* has been discussed within the Commission for Science, Education and Culture – the same happened years ago for projects like *Human stemcells* and *Xenotransplantation*. Specific parliamentary groups are another target of the office attention: TA-SWISS presented the study *Biofuels of second generation* at one of the meetings organized by the group *Climate change*.

Indirect influencing could be obtained through collaboration with the governmental administration: the federal offices for example collaborate actively with TA-SWISS but they are also potent institution with a huge influence on legislators.

10.3.5 Reflection on criteria of success

A good report, with balanced and well founded TA-analysis, is mandatory for TA-SWISS and its importance is evident from the interviews with stakeholders. “The first step was to make good reports on important issues”, says Longet. Astrid Stuckelberger, psychologist and gerontologist at the Centre Médical Universitaire, Geneva, coordinated the TA-SWISS study *Anti-Ageing Medicine* and is content with the report: “In general I am very happy with the results, they are scientifically solid and nobody will be able to attack them today. The book has made an impact and I was asked to give talks and publish other articles or even develop expertise to shape up new forms of care or hospitals.”

But things don’t always go smooth. Some projects didn’t come out as expected, for example *Emancipation of the computer* (2008), according to Bellucci. In this case the results didn’t fit to the TA quality criteria, and the Steering Committee decided not to publish the report delivered by the project group. Instead it was decided that the president of the accompanying group (who was also member of the Steering Committee) and the project manager collected inputs from various experts on the topic and published them in a book.

In the words of the interviewees, successful projects are the ones which have good quality AND make an impact. “Media coverage is very important”, says Ruegsegger recalling a recent article in the NZZ newspaper referring to the *Digital natives* PubliTalk. Consideration and resonance within the political arena is even a bigger index of success, which is also closely related to the institution mandate. For this reason projects like the publifocus on *Road pricing* (2004) or the study *Nanofood* are high ranked within and outside TA-SWISS.

But Stuckelberger doubts that TA-SWISS can make a big impact on politics and the great public - which is indeed eager for more information. Both Longet and Riklin support this opinion and Sergio Bellucci admits

the issue exist: “We have to improve our awareness within the Parliament and other organisations (we get still questions like "What's TA-SWISS?"). Being able to measure the true impact of TA activities could help the institution fine tuning some strategies to better reach its objectives.

10.4 Case study: Anti-Ageing Medicine: Myths and Chances

Institutional context of TA-SWISS, relationships with stakeholders and other organisations, organisation of work, priority setting, TA approaches and connections to politics have all been described in general in the previous paragraphs. But it's in a real project that all these aspect of a TA activity come to life and parliamentary TA that strives for political attention can be seen “at work”.

As it came out from the interviews with stakeholders and insiders (e.g.: Stuckelberger, Bellucci), the study *Anti-Ageing Medicine: Myths and Chances* has an interesting story: a pioneer area of medicine scrutinized, a difficult start due to some methodological difficulties, a good final report, but a still unclear political impact. Besides, the interdisciplinary study was connected with a small participatory method, a PubliTalk. For all these characteristics these project could give a good insight into how TA-SWISS works.

10.4.1 Selection of the topic

For several reasons, this topic has been considered as suited for a TA-Project. (i) The “ageing of society” is a well-known phenomenon, at least in Europe. Modern medicine makes it possible that, e.g. in many European countries, life expectancy for women is more than 80 years and for men it is between 75 and 80 years – and it is still rising. But what about quality of life? (ii) Anti-Ageing medicine promises a good quality of life for old people, if you use certain treatments or products. But are these things effective? (iii) Biological research finds more and more relations between genetic factors and ageing. In animal experiments, life expectancy of worms, flies and mice could be extended by genetic manipulation. Are such things on the horizon for human beings?

Considering these interesting developments, the TA-SWISS staff proposed to the Steering Committee to carry out a study on anti-aging medicine. The Steering Committee accepted and the staff elaborated a detailed description of the topic and a plan for the project. Furthermore, other institutions have been asked for co-funding. Two institutions joined the project funding body, i.e. the Swiss Academy of Medical Sciences (SAMS) and the Swiss Innovation Promotion Agency (CTI). Finally, the Steering Committee accepted the focus, plan and budget of the project and the call for tenders for the study on anti-ageing medicine could be launched.

10.4.2 Project activities

Study

The call for tenders for the study was announced in September 2005 and remained open until December 2005. TA-SWISS received only three proposals, but two of them were of good quality, these have been submitted to the Steering Committee and one was recommended for approval. The Steering Committee followed this suggestion and gave green light for the proposal worked out by the psychologist Dr. Astrid Stuckelberger and the demographer Prof. Philippe Wanner (both working at the University of Geneva). The basic data concerning content, methods, time schedule and remuneration for the study were then arranged in a contract with the project group. For the purpose of quality control, TA-SWISS constitutes for every study a subject-specific expert group which has the task to supervise the project (*Begleitgruppe*, i.e. accompanying

group). For the study on anti-ageing medicine, the expert group consisted of 12 members. An early link to politics was given due to the fact, that a member of the parliament participated also in this group, actually not as an expert with technical competence but rather as a “go-between” who introduced the aspects relevant for politics, e.g. aspects of health care for the elderly or gender aspects.

The first meeting of the project group and the experts was organized by TA-SWISS in Mai 2006. During the study, three further meetings took place: in October 2006, in March 2007, and in August 2007. Because the project group from the University of Geneva was not familiar with the “TA way of thinking”, one special meeting of TA-SWISS with the project group was organized with the aim to show the importance of (i) the interdisciplinary approach and of (ii) setting priorities within the large field of questions related to anti-aging medicine.

The draft final report of the study was accepted by the accompanying group at its last meeting in August 2007, but many suggestions for the revision were also made. So the project group worked again on the manuscript. A revised version was ready for external review in October 2007. Then, the final report and the two short comments of the external experts was submitted to the TA-SWISS Steering Committee in November 2007. The Steering Committee approved the report – but asked for some minor revisions.

The project group had to make these changes and, in parallel, formally adjust the manuscript to the requirements of the publishing house. The latter took a long time – so the printed book (comprising 304 pages!) was ready only in August 2008. TA-SWISS commissioned a science writer to write a short version of the study (10 pages). The short version was translated from German into French and English and an illustrated booklet was produced containing the text in the three languages. The brochure was ready in April 2008 and was used to communicate the results by a press release.

Publitalks

Because the study was based on the expert’s point of view and on literature research, TA-SWISS organized in October 2007 two so-called *publitalks* to find out how elderly people and caregivers think about anti-ageing medicine. To give a comfortable atmosphere, only small groups of people were invited for the discussion: seven for the meeting with the caregivers and ten for the meeting with elderly people. The participants received a short fact sheet in advance, and before the discussion started, a member of the study project group gave a short overview on the main results of the study. The discussion was lead be a moderator who made sure that certain topics were treated during the talk.

10.4.3 Project results

Some of the main results of the study can be summarized as follows:

The possibilities of anti-ageing are promising, yet many are still either at the experimental stage or only theoretical. While there is a range of medical procedures which are clinically applied today, others are only hope for the future. Many active substances, such as hormones and vitamins, have become part of everyday life and are today developing through a whole range of products and fortified food. So although this has created an extremely lucrative market and despite the positive results, the impact of anti-ageing medicine on successful ageing has not yet been thoroughly studied. While in many cases the use of these substances is not harmful, there are other products, such as hormone replacement therapies, which pose a contradictory risk-benefit dilemma to health.

It is unclear whether anti-ageing medicine as a whole contributes to improving the ageing process in general, or whether its benefits are limited to individual cases according to case indications. The characteristics of anti-ageing medicine are that: (i) in many cases the evidence for its effectiveness is not fully proven by well conducted randomized clinical trials, (ii) not all new possibilities of intervention are utilised to treat injuries or for prevention, and (iii) despite its growing importance, the market is not controlled. These three areas require further investigation.

Concerning the first point, the TA-SWISS study concludes that better studies on the effectiveness of these methods and products are required, as also further control on the dangers and risks of anti-ageing medical practice and devices. Consumers' interest, at any age, is at stake – because certain methods used may create a danger if they are carried out by unqualified staff or with untested technological devices. Medical practitioners are in a better position to evaluate the successfulness of the treatment according to individual's condition (biological age, gender, health condition), thus offering a new type of “tailor-made” medicine, which requires the adaptation of continuous medical education. With respect to the rapid transfer of scientific findings to quality products and interventions for anti-ageing (second point), there is need for improvement through communication and coordination. For the third point, we need a stringent system of quality and safety control for new procedures, that must be combined with compulsory labelling. In this case, however, it is important to bear in mind the international dimension of the market for anti-ageing preparations: Switzerland has to consider how European and international regulations can respond to safety measures corresponding to the transnational dimension of the anti-ageing market.

The main results of the publitalks are here summarised in short:

Both groups of people involved in the discussion on anti-ageing medicine had a sceptical view. Cosmetic interventions with the aim of removing traces of age were clearly disapproved. In contrast, applications which improve the independence of elderly people were supported. Nevertheless, most of the participants agreed on the fact that incalculable social problems would emerge, if it would be possible to extend lifespan to a level considerably higher than today's average.

For the group of caregivers, mental health is the most important aspect of health at all. Mental health is very important for the group of elderly people as well, but this group also appreciates good physical health because this is a prerequisite for the mobility required for an independent life.

Small differences in the opinions of the two groups can also be found in the relation to the efforts considered for improving health. The group of caregivers favours physical activity, healthy food and wellbeing (physical and mental). These suggestions are approved by the group of elderly people as well, but this group appreciates the advice given by physicians too.

10.4.4 Type of expertise used

Because TA-SWISS is a small institution, the internal expertise cannot cover all the research fields. That is one reason why TA-SWISS mandates external project groups for its studies. In the case of the study on anti-ageing medicine, the project group was led by Dr. Astrid Stuckelberger and Prof. Philippe Wanner. Wanner is a demographer and Stuckelberger is a psychologist with a rich experience in research on health of elderly persons. Four more experts contributed to the study as co-authors and more than 40 Swiss experts as well as experts from other countries (in particular Japan) have been consulted.

For quality assurance, TA-SWISS appointed the so-called «Begleitgruppe» (accompanying group). It consisted of 12 persons from different fields of expertise, most of them specialists in medicine or life sciences, but among them were e.g. a sociologist, an ethnologist, a politician and an NGO representative. The project group and the experts met four times during the study to discuss intermediate results or draft versions of the report. Furthermore, external review of the draft final report was done by two further experts and this version of the report was, together with the expert's comments, submitted to the TA-SWISS Steering Committee. The Steering Committee approved the report, but some minor revisions had to be done.

10.4.5 Transfer of project results in the political sphere

To establish an early contact to the political sphere, a member of parliament was invited to join the accompanying group. This MP could not only learn about the study results in an early phase, but she could also make suggestions for the development of the project.

To communicate the study results to the political sphere, an event for the members of parliament was organized in March 2008. On that occasion, the most important results of the study were presented by Dr. Stuckelberger, the main author of the study. Several experts (from medicine, ethics, etc.) were invited at the meeting as well to cover a larger scope of expertise for the discussion.

10.4.6 Political impacts

The MP, which was a member in the accompanying expert group, submitted in March 2008 a *postulate* in the National Council (Nationalrat). A postulate is a formal request, which asks the government (Bundesrat) to analyze a certain question and to suggest measures if necessary. The postulate requested to launch a National Research Program (NRP) on anti-ageing medicine which should cover the following topics: effectiveness and safety of anti-ageing products, monitoring measures and ethical guidelines, protection of consumers, and prevention strategies for healthy ageing. The postulate referred to the TA-SWISS study and it was co-signed by 19 MPs.

But in May 2008 the government declined the postulate and it advised the National Council to do the same. The refusal was explained by the following facts: National Research Programs (NRP) should be initiated in a bottom-up way (i.e. by the researchers) and not top-down; and for most of the issues suggested by the postulate, there are already appropriate authorities, e.g. Swissmedic (for approval of drugs), the Federal Office of Public Health (for prevention strategies) and the Swiss Academy of Medical Sciences (for ethical guidelines). At least, the government recommended that these authorities should also consider aspects related to anti-ageing medicine. In view of these arguments, the National Council did not act on the postulate within two years, so it expired.

10.4.7 Elements that determine the political impact

One of the crucial elements may be the political agenda. But because technology assessment should work in a prospective way, in some cases it may be ahead of the political agenda. So the political impact may be comparably small, if the results of a TA project are published but the politicians are not ready for it. In this case it is important to jump on the bandwagon when, later on, politics treats a topic already studied earlier by TA. A very good success would be, if TA could draw the attention of politicians to a certain subject recognized as important by TA, but not yet present in the political sphere. But this is difficult in

consideration of the fact that politicians prefer subjects that are popular in the media and/or urgent to treat – and these may not always be the upcoming themes identified by forward-looking TA.

This was in part also the case for anti-ageing medicine. There was no easy way to motivate politicians to pay attention to it. Fortunately, the MP who was a member of the accompanying group submitted a postulate (see above), so the subject was transferred in the political sphere. This is a good result, it was possible due to the direct involvement of a politician. The government had to answer the postulate even if it decided to take no further action. To introduce the results of TA projects in the political process is important, but the power of TA is limited. Politicians are free to decide what to do – and even if they take note of the TA results, as far as there is no debate on this subject and no legislative process related to it, it is difficult to quantify the impact of the project.

10.5 Future challenges for TA-SWISS

The main challenge is to keep the main strength and niche of being credible and independent, but at the same time to expand the dialog with politicians, the influence on society and the use of more and better partnerships.

Expansion of dialog with politicians is connected with building the system, which allows early involvement of Parliament in formulating the subjects for the studies or even some aspects of Terms of Reference (i.e. going to "proactive" involvement of MPs rather than "reflective"). Development of personal contacts with representatives of main political coalitions is an essential instrument to avoid partiality. A TA-SWISS big strength is that the topics are initiated at project manager's level, later approved by the Steering Committee members and implemented. But those ideas have to be better "sold" to Parliament at early stages through communication and personal contacts.

Influence on society is reached through partnerships and communication, which will remain the big challenge looking at resources and trying to stay impartial. Small institutions with specialized themes and without proper budget for communication can't make the big impact on society. So targeting of most influential groups, news multipliers (media, NGO's, strong opinion leaders), using new communication channels (social media, "virus" video, provocative actions or even games) and using good practice of delivering "translated" messages from science to societal and political language (policy briefs, newsletters, short reports) may have better impact even with small resources. In general the challenge with communication will be how to show the impact instead of deliverables. The challenge with partnerships will be to use existing good organisational skills and create better coordinated actions after the research or study is performed, to form the coalitions, complex systems of support (i.e. not putting good recommendations but also driving change and building bridges between different partners, politicians and society).

The choice of topics remains a challenge connected with financing. With better financing there are possibilities of doing wider studies, including more societal or even educational aspects, involving more stakeholders and interest groups, applying more participatory methods.

In general, the issue of financing is a sensitive one for the whole TA-SWISS activity. Since the decisions on the budget are centrally taken by the Parliament every 4 years there is always a risk of a setback or even of a closure due to a reduction in the allocated money, especially in times of economical crisis. Another threat for the institution relates on the approval that a particular political class may have towards TA-SWISS activities.

Finding balance between advisory and research role may be a challenge as well. Being in the center of research/policy/society triangle is an ideal situation. But even now not all stakeholders understand the role of TA-SWISS in the same way. More discussions on the role may be needed, looking at good practice in other countries. Aligning communication to position TA-SWISS as an advisory organisation which relies on research initiatives and drives the change for at least 2-3 years after the research is performed is essential to have bigger impact.

Chapter 11 Options for institutionalising, organising and performing Parliamentary TA

Jurgen Ganzevles, Rinie van Est, Frans Brom (all Rathenau Instituut) et al.^{122,123}

The PACITA project aims to empower European member states and associated countries with an interest in Parliamentary TA to make informed decisions. Furthermore, it is meant to stimulate reflexivity in regions and countries with established Parliamentary TA organisations. By doing so, PACITA helps to improve the quality of knowledge-based decision making on science, technology and innovation in Europe. This study, within the PACITA context labelled as ‘Task 2.1 TA Practices in Europe’, tries to contribute to this overall objective by explicating the many political, strategic and practical choices involved in institutionalising, organising and performing Parliamentary TA.

In the preceding chapters we described the practices of Parliamentary TA in eight countries or regions: Austria, Catalonia (Spain), Denmark, Flanders (Belgium), Germany, the Netherlands, Norway and Switzerland. Each country’s TA organisation was described thoroughly and in-depth. Their practices do not fully cover the PTA landscape in Europe. Still, this set of countries covers an important part of the variety of Parliamentary TA we find in Europe. More importantly, the variety within the set provides a broad insight in the political, strategic and practical choices involved in Parliamentary TA. In this final chapter, we expanded the scope. Where it seemed relevant, we included references to additional practices of Parliamentary TA, based on the more limited descriptions found in earlier studies.

In this final chapter we employ the conceptual framework that was set up in Chapter 2 “Positioning and conceptualising Parliamentary TA”. Central to this framework is that we understand Parliamentary TA in both informational and relational terms. With respect to the latter we position Parliamentary TA in the complex institutional space that is defined by four societal spheres: parliament, government, science & technology, and society.

In this concluding chapter we analyse Parliamentary TA on three interconnected levels:

- Section 11.1 focuses on the institutional level. In what way is Parliamentary TA legitimised as an institutional solution for an institutional problem that concerns the relationship between science & technology, society, government and parliament? What kinds of institutional tasks do TA organisations that perform Parliamentary TA have? Who are its clients? From which societal spheres does the support for institutionalising Parliamentary TA come from? And lastly, how is support for Parliamentary TA maintained or lost?

¹²² Co-authors are, in alphabetical order: Frédéric Adam (University College Cork), Zsigmond Attila (HAS-SEC), Mara Almeida (ITQB), Marianne Barland (NBT), Danielle Bütschi (TA-SWISS), Zoya Damianova (ARC Fund), Pierre Delvenne (Spiral, Université de Liège), Ferran Domínguez (CAPCIT), Johan Evers (Instituut Samenleving & Technologie), Emiliano Feresin (TA-SWISS), Jon Fixdal (NBT), Katalin Fodor (HAS-SEC), Lenka Hebakova (Technology Centre ASCR), Leonhard Hennen (ITAS, KIT), Anders Jacobi (DBT), Ádám Kéglér ((HAS-SEC), Edgaras Leichteris (KEF, Lithuania), Lars Klüver (DBT), Ventseslav Kozarev (ARC Fund), Belén López (FCRI), Michael Nentwich (ITA-OEAW), Linda Nierling (ITAS, KIT), Paidi O’Reilly (University College Cork), Marie Paldam Folker (DBT), Walter Peissl (ITA-OEAW), Benedikt Rosskamp (Spiral, Université de Liège) and Mahshid Sotoudeh (ITA-OEAW).

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- Section 11.2 looks at the organisational level of Parliamentary TA. The main question here is, which actors from which societal spheres have a voice in steering the various activities of the TA organisation.
- Finally Section 11.3 zooms in on the project level, that is, on performing (parliamentary) TA. Issues at this level are how to frame a certain topic, what kind of methods to choose and how to communicate the results of your TA project to the parliament, and to other relevant clients, in order to have an impact on the (public and political) debate on science and technology.

Section 11.4 discusses the main future challenges according to existing Parliamentary TA organisations. The chapter ends with conclusions and implications, addressing both existing organisations and new countries and regions (Section 11.5).

11.1 Institutionalising Parliamentary TA

Establishing a TA institute with the task of performing Parliamentary TA takes a long time. In the investigated countries and regions the establishment of such an organisation took one to two decades. It all begins with setting the stage in politics. Political entrepreneurs start framing problems in the complex field of science and technology policymaking, to which a new organisation is expected to provide an answer. Such a proposal evokes discussions about the politically desired organisational tasks and the positioning of such an organisation.

When a political majority for a certain proposal is not reached in due time, it is very well possible that the idea to establish PTA will disappear from the agenda again (e.g. in the Austrian case in the mid-1990s).

Developments in the landscape of innovation policy, however, may well put PTA back in the centre of attention. When the time and institutional context are right, a political decision is made on the actual establishment of a TA institute with the task of performing Parliamentary TA. After its establishment, organisational evolution will continue.

Below we will clarify some relevant issues with regard to institutionalising PTA, summed up in Box 11.1. Section 11.1.1. zooms in on the framing of problems in the landscape of innovation policy. In order to address such problems, a PTA organisation may carry out a number of tasks. The range of potential tasks is discussed in section 11.1.2. Strongly related to these tasks are questions of empowerment and support. Which societal spheres should the organisation mobilise and connect? This is discussed in Section 11.1.3. The politics of the continued evolution of TA organisations that perform PTA is clarified in Section 11.1.4.

Societal problems

- Which problems are perceived with developments in science, technology and innovation (ST&I)?

Institutional tasks

- Which tasks should the organisation take up, in order to address these problems?

Political support

- How to mobilise and maintain long term political support for the organisation?

Further evolution

- How to keep the organisation responsive to changing demands?

Box 11.1. Institutional issues for Parliamentary TA

11.1.1 The framing of problems in the innovation system

Parliamentary TA operates in a complex institutional landscape that consists of four societal spheres: parliament, government, society and science and technology (see Figure 11.1). Interactions within and between these spheres is, to a high degree, economically and innovation driven. Depending on the position of the TA organisation within this institutional landscape and its task, it will influence various connecting interfaces of some of those societal spheres. Of course, other (complementary or competing) organisations may also be active in this institutional space.

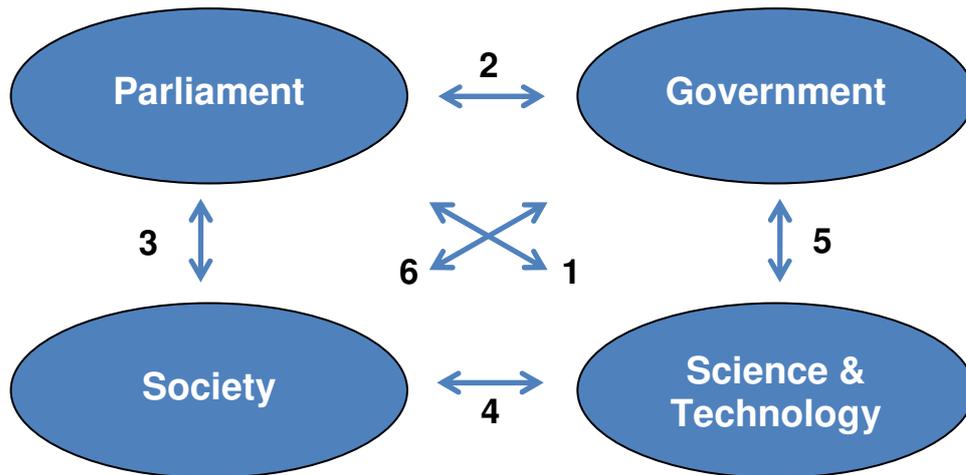


Figure 11.1 (Parliamentary) TA between parliament, science and technology, government and society

In the various countries studied the institutionalisation of PTA coincides with historical trends such as the intensification of scientific and technological developments, large scale industrialisation, the stimulation of innovation and the appreciation of economic growth. These techno-economic trends evoke a number of societal hopes (human welfare, health, sustainability) and concerns (safety, environmental degradation, equity and equality). The concerns cause unease within society about the ability of existing institutions to face such challenges. Setting up a TA organisation with certain tasks might be promoted as a (partial) answer to the institutional problems that have been signalled. Box 11.2 provides a number of historical examples.

In the political discussion on the pros and cons of establishing Parliamentary TA three interfaces play a central role: 1) the interface between the parliament and science, 2) the interface between parliament and government, and 3) the interface between the parliament and society (see Figure 11.1).

From the start, TA has been promoted as scientific support through the timely informing of parliaments about negative social impacts of S&T (interface 1). Furthermore, Parliamentary TA is promoted because of the promise that it may change the power balance between parliament and government by offering parliamentarians arguments that they can use in their task of controlling the government (interface 2). Third, it is regularly claimed that PTA might also play a constructive role in public controversies on science and technology, for example by informing politicians about which scientific and technological developments may or may not likely count on public support (interface 3).

Austria

Since 1978, when the majority of Austrian citizens rejected the newly built nuclear power plant at Zwentendorf in a plebiscite (interface 4 in Figure 11.1), it has been obvious, that such expensive errors should be avoided, by using systematic analyses and a prospective technology policy (interface 1 and 5). The second hot political issue was the conflict around the hydroelectric power plant in the river Danube near Hainburg, east of Vienna, in 1984, and later the debate around biotechnology. These developments were crucial for opening up the technology policy sphere towards the public (interface 3 and 6) and, hence, preparing the ground for TA.

Catalonia (Spain)

Collaboration between parliament and research organisations (interface 1) has taken place for a long time. This evolved into the establishment of the CACIT platform in 1999. This platform was a joint effort of representatives from scientific, economic and social sectors, to strengthen the voice of science and the research community towards the presidency of the government (interface 5).

Denmark

Danish Technology Assessment took conceptual roots in the midst of widespread discussion and controversy in the 1970s and 1980s surrounding controversial issues such as nuclear energy, biotechnology, and a growing concern on the side-effects of information technology at the work place (interfaces 3, 4 and 6). For example, strikes were held against the introduction of new technology in production processes and social movements emerged against nuclear power. Various forms of protest materialised upon the adoption of the Environmental Act in 1974 (interface 5), a so-called technology agreement among trade unions and employees giving workers a say in decisions about the implementation of new technology (interface 4), and upon the final decision to abandon nuclear energy in 1982 following a long heated public debate (interface 3 and 6).

Flanders (Belgium)

Flanders (1988 – 1992) aimed at rationalising strategic choices in technology policy and research programmes (interface 1 and 5) from a social perspective (interface 4). This was related to a broad societal debate on the gap between policy makers and citizens (interface 3 and 6), on the role of scientists providing independent and sound advice on developments in science and technology, such as GMOs and on dioxin (interface 1 and 5). The trust of citizens in the political system was at stake.

Germany

In the 1970s, there was a perceived lack of scientific support for parliament (interface 1), which had to deal with more and more technology-related issues and the growing public awareness of the unintended negative (at that time mainly environmental) consequences of technological development (interface 4) that led to the emergence of powerful public interest groups (interface 3 and 6). These issues were highly relevant, because of the governmental innovation strategy in Germany (interface 4 and 5).

The Netherlands

In the period 1975 to early 1980s, it was especially the government that searched for new ways to deal with growing societal concerns (interface 6) regarding the technological innovations it pushed forward (interface 5). An example is the 'Broad Societal Debate' on nuclear energy. Societal concerns were instigated by civil society and a growing technology and society movement in academia (interface 4).

Norway

In the period from the mid-1970s until 1993, the political legitimisation (interface 3 and 6) of further industrialisation (interface 4) was at stake. The oil and gas sector, and later on the ICT sector, grew in economic importance. R&D programmes for risk assessment, macroeconomic issues and societal impact (interface 4, 5 and 6) were set up. Later on, a 'Future Oriented Technology Policy' programme was established (interface 1 and 3).

Switzerland

In the 1970s, public support for political decisions in using opportunities of science was an important argument (interface 1 and 3). Proponents sought an institution that could act as a mediator between opinions and facts (interface 1 and 5). In the 1990s, the political sphere acknowledged the importance of providing authorities, regulators and researchers with the necessary knowledge to minimise risks and damaging impacts. Later on, the wider public and societal concerns were also considered relevant (interface 4).

Box 11.2. Historical examples of ways in which the institutional landscape of innovation is challenged.

Critics focused on the same three interfaces. The science and technology field regularly depicted TA as technology harassment. TA was feared to slow down innovation, because extra bureaucracy was introduced in the political decision making process (interface 1). Critical social groups feared that TA would become a governmental instrument to push science and technology, which also affects the power balance between parliament and government (interface 2). Others feared that TA would diminish the public support for political decisions on innovation (interface 3). Before zooming in further on the political debate on establishing Parliamentary TA, we explicate the potential tasks of such an organisation that performs Parliamentary TA.

11.1.2 Elements of task descriptions of Parliamentary TA organisations

An important element in the political debate about establishing or reflecting on a PTA organisation is what it should do. In practice, organisations may carry out a range of activities that is broader than suggested by their formal assignment. In this section, we will focus on the elements of the formal task description, since they are at the centre of the political debate on establishing a Parliamentary TA function. All tasks are related to developments in science, technology and innovation (ST&I). An overview of task descriptions of individual organisations can be found in Appendix A.

Task 1. To perform broad, interdisciplinary impact analyses of developments in ST&I

When establishing a new PTA function, the object of study must be identified. In essence, TA deals with societal issues related to science, technology and innovation. Optionally, the organisation may be asked to focus on a specific technological domain, such as (nuclear) energy or information technology. In the institutes we investigated this is not the case. Their existing mission statements reflect openness towards all kinds of scientific and technological developments.

A mission statement can also specify the kind of analysis that should be carried out. All forms of TA require an interdisciplinary approach. A task description may define the ranges of impact that the new organisation should focus on. TA may be set up to take up an early warning function, clarifying the risks and chances of developments in S&T in an early stage. This can be detailed further, by stating explicitly the collection of effects the organisation should include, as is done for Flanders, the Netherlands and Switzerland. Such effects could be social, cultural, ecological, economic or juridical. In addition, an organisation may be asked to provide ethical reflections on the impact of S&T. On top of that, an organisation may have the task of contributing to the further implementation of S&T developments in society. In Germany, this is the case. The organisation has the formal task of addressing the framework conditions for implementation.

Task 2. To be relevant for policymaking on ST&I

This task is primarily specified by defining the formal political clientele. By definition all forms of PTA address the national or regional parliament. But TA organisation that perform Parliamentary TA may also have the task to serve other clients that are part of the (international) innovation system: other parliaments (such as the European Parliament for the German, Dutch, Danish, Catalanian and Austrian case), the government as such (as for Switzerland and Austria), governmental authorities (as in Norway), political decision-makers in general (Denmark), or the Cabinet (in the Netherlands, mentioned explicitly for its additional Science System Assessment task).

Apart from providing information and recommendations in a generic sense, we framed four more ways to contribute to policy making on S&T:

- To develop alternative options for the policy-making process. A more specific subtask, derived from this, is to indicate possibilities for avoiding or reducing the risks of new technology. The German mission statement provides examples of these tasks.
- To translate information and attitudes into knowledge and recommendations for policymaking, as exemplified by the Flemish situation.
- To contribute to the formation of political opinion on issues that relate to or are the consequence of scientific or technological developments (the Netherlands and Catalonia).
- To communicate results to policymakers (as reflected in the Danish and Norwegian mission statement).

Task 3. To involve society in developments in ST&I

An organisation that performs Parliamentary TA may be given the task of involving society on ST&I. This can be specified further, in two dimensions:

- by formally stating how societal views should be represented in debate. This could be limited to involving relevant civil society organisations for certain S&T developments, or extended towards addressing society at large, including lay people (as done for Denmark, Flanders and Switzerland).
- by explicating the direction of communication. There may be a formal obligation to disseminate the results to a broader public, in order to raise public awareness (as written down for Denmark and Norway), and/or a formal aim to work with public participation procedures (Denmark, Switzerland), which passes information in the other direction: from the public to the TA organisation. This direction of communication could also be two-way, or undecided for, by speaking, more neutrally, of contributing actively to a social or public debate (as for Flanders and the Netherlands) or of promoting mutual understanding of science and society (Switzerland).

Task 4. To watch trends in ST&I

In Germany, Norway and Switzerland the formal task to watch trends in science and technology is included in the mission statement, and in Austria, too, activities on a project level are focused on this. In these cases the TA organisation has the formal obligation of scanning the horizon for new challenges, related to developments in S&T. In addition to looking at potential risks, the institute may be asked to specify the opportunities offered by S&T, as is explicitly stated for Germany and Norway. The common character of such opportunities may be highlighted – as a counterbalance against excessive focus on economic growth as such. This is explicitly asked for in the Norwegian case. The mission statement in that country speaks of benefits for individuals and society at large.

When establishing a new institute, politicians may also decide to include the task of watching how society deals with existing S&T. A technology such as nuclear energy has already existed for years, but faces new waves of public and political controversy, when an accident such as in Fukushima occurs. The task of dealing with controversial technologies is mentioned in the mission statement of the Swiss organisation.

Task 5. To build bridges between actors in the field of ST&I

All organisations that perform PTA will need to cooperate with their stakeholders. Nevertheless, politicians must decide whether they want to include a kind of formal obligation for cooperation in the mission statement. Strong cooperation with the scientific community may be demanded, such as in Catalonia. The Catalanian platform has the formal task “[t]o cooperate and collaborate with the institutions, organisations, universities and other organs and institutions active in the fields of science and technology, and also to coordinate these tasks.” Strong cooperation with a broader set of relevant societal actors is a formal task for

the Dutch organisation. It is also explicitly stated that the organisation may widen its field of activity and seek connections with, for example, counterpart organisations in Europe.

Task 6. To contribute to ethical, humane and sustainable ST&I

It is the fundamental aim of any Parliamentary TA organisation to contribute to a more socially sound development of ST&I. An indirect way of doing so is by contributing to a ‘better’ societal and political debate (see Task 2 and 3) is an indirect way of doing so. The rationale is that a more informed debate will contribute to better science and technology. The norms at play and the values to be decided upon are seen as part of this democratic process, in which decisions on ST&I are made. The desired impact of a Parliamentary TA organisation, related to these tasks, would be the impact on this debate. This vision on the role of Parliamentary TA is in line with what we could call a ‘deliberative’ vision on society (see, for example, Bovenkerk 2012).

An extension of this would be that the organisation takes a more normative stance, by formulating more explicitly that its work is aimed at ethical, humane and sustainable ST&I. This reasoning is more in line with what one might call an ‘enlightened’ vision on society, where science and technology are the important driver for bringing progress. In this vision, the desired impact of a Parliamentary TA organisation would entail a more direct improvement of science and technology. This underlying vision is, for instance, reflected in the mission statement for Norway. The normative concept of sustainable development also plays a role on the project level in Austria.

11.1.3 Establishing a PTA institute: a question of empowerment in the long term

At the heart of the political debate on institutionalising TA there are two questions. First, which societal sphere is going to be empowered by the new organisation: will there be a stronger position for the parliament, the government, science or society? Second, which societal sphere will get an influence over the TA organisation that will perform Parliamentary TA? These are politically sensitive questions. Therefore, it comes as no surprise that in the investigated countries it took up to two decades from the first time PTA was put on the political agenda until the moment that political decision making on PTA turned into the establishment of an organisation.

We see a process where political entrepreneurs fight for getting support in the political arena. In Germany several models of PTA were proposed in the 1970s. The actual instalment of the first TA office took place in 1989. In the Netherlands, the first motion on Parliamentary TA in 1975 came from the liberal democrats (D66). This political party was inspired by the establishment of OTA in the United States and accordingly proposed a TA organisation close to the parliament. This proposal was rejected. A few years later, motions on ethical rulemaking for scientific practices were proposed, and also rejected. Finally in 1986, NOTA, the predecessor of the current Rathenau Instituut, was established. In Flanders, Social Democratic Minister of Economy Norbert De Batselier (1988-1992) wanted to introduce a TA function in the Flemish technology policy. It was the Green party that proposed to establish a Parliamentary TA institute in 1996. However, there was no political support from the Christian and Social Democratic government coalition. TA did not constitute a priority on the political agenda of Christian Democratic Minister-President Luc Van den Brande. Van den Brande feared that such an instrument might slow down the government’s innovation priorities, for example in the field of biotechnology. The organisation was not established until 2000. In Switzerland too, there is a long and standing bid for TA. France (OPECST) and, to a lesser extent, the United Kingdom (POST), also show patterns of long term political struggles in establishing Parliamentary TA (Delvenne 2011).

Support from the scientific community, especially when represented in national advisory bodies, can push political decision making on Parliamentary TA a step further. In Flanders, several strategic councils such as the socio-economic council of Flanders (SERV), the Royal Academies for Science and the Arts of Belgium and the Environment & Nature Council (MINA Raad) were in favour of establishing a Parliamentary TA organisation. The director of the Flemish Foundation for Technology Assessment (STV/StIA), Paul Beckmans, suggested establishing a permanent TA institute. In Catalonia (before 1999), there was strong support from the scientific community. In Norway (1990 – 1995), two members of staff of the National Committee on Research Ethics in Science and Technology advised to institutionalise TA, preferably according to the ‘Danish model’ (which has a strong focus on empowering society). Further backup came from a first consensus conference – a joint effort of research ethics committees and the Norwegian Biotechnology Advisory Board. In the Netherlands (1980 – 1984), the wish to establish TA acquires backbone through the Rathenau Committee, which proposed a permanent TA institute, and through the Broad DNA Committee, which proposed to include ethical and societal aspects in the guidelines for working with DNA.

In the long term political debate about whether or in what way to institutionalise a Parliamentary TA function often a limited number of competing organisational models are discussed. In Germany, three competing models entered the stage in the 1980s. The Green party suggested forming an academy that would serve as a platform for social debate. In contrast, Social Democrats preferred a scientific unit, to be part of the parliamentary administration. A third option was promoted by the Christian Democrats: an office attached to the parliament but run by an external scientific organisation. In Norway, the standing parliamentary Committee on Education, Research and Church Affairs suggested an organisation outside the Parliament, installed by the government. And in their 1984 White Paper, the Dutch government proposed the idea of housing TA activities within the Ministry of Education and Science, as an alternative to housing it within the Scientific Council for Governmental Advice (WRR) or the Royal Dutch Academy of Sciences (KNAW). The Christian Democrats, however, preferred an organisation that is ‘independent’ from government, parliament or other social organisations.

The actual establishment of an organisation that performs Parliamentary TA requires a democratic decision. Where to position the new organisation in the institutional landscape? In Germany, the majority preferred the model that was proposed by the Christian Democrats at that time. Once established, the Greens and Social Democrats did not want to open up the debate again. To ensure parliamentary control over the office, the secretariat of the Parliamentary Committee that is to deal with the TA office became enlarged (1989 – 1993). Moreover, flexibility was built in: the office would be evaluated, every three to five years. In Flanders, the outcome was the installation of a PTA institute as one of the four para-parliamentary organisations. In Switzerland, a pilot phase was created in 1991, establishing TA SWISS as part of the Swiss Science and Technology Council. In 1999 in Catalonia, the CACIT platform that was created by the Catalan government in 1999, which aimed to advise the presidency of government. The platform was composed of representatives from science, but also from the social and economic sectors. In Denmark, the Social Liberal Party supported the agenda of the Social Democrats for installing an organisation that could serve as a counterweight to the work of the government and its administration, but the liberals emphasised a need for public debate and participation, as a key to Danish TA.

Democratic legitimacy for installing Parliamentary TA, however, does not guarantee support for PTA from society or science. Introducing a new entity into the existing innovation landscape will change the existing power balance. Some actors will embrace it, others will actively oppose it, and many will be neutral or silent

about it. In the Netherlands, politicians decided to install the new TA institute as part of the Royal Academy of Science, which was reluctant in accepting it. And in Switzerland, there was a passive scientific community at the time that TA SWISS was established (1992).

11.1.4 Institutional evolution of a Parliamentary TA organisation

After a TA institute that performs Parliamentary TA is established, the development of the institute and discussions over its role may continue. After its establishment in 2002, hardly any institutional changes took place for the Norwegian institute. In contrast, fierce changes are ahead for IST in Flanders (established in 2000) and have already been implemented in June 2012 for the Danish Board of Technology in Denmark. The Dutch institute (established in 1986) faced a big change in 2004 when its tasks were broadened with Science System Assessment. The institutional setting also changed in Switzerland. More modest changes occurred in Germany and Catalonia.

In order to maintain ongoing support PTA organisations have increasingly tried to make the impacts of their work explicit and visible. Several organisations monitor their research products and other activities. Indicators such as publication lists, events organised, quotes in parliamentary documents and number of website visitors are published in annual reports, newsletters and websites.

Key to the successful evolution of a PTA organisation is the continuous accumulation of trust. A successful pilot phase, with limited scope, may set the stage for a permanent organisation, as happened in Germany (1993) and Switzerland (1999). Politicians and other stakeholders had the chance to get used to and benefit from PTA, without having to publicly defend the idea that much public capital is spent on an unsure, one-way path. But also after organisations have acquired a permanent status, processes of trust building remain important. Exemplary for this importance of trust building processes is the German situation, where a group of parliamentary rapporteurs for TA committed themselves to take decisions based on the consensus principle and not on the majority principle, in order to be accepted and supported by all parliamentary fractions. More generally, Parliamentary TA organisations continuously renew their bonds with all four societal spheres: parliament, government, science & technology and society. These bonds can be tightened, loosened or deliberately left unchanged, which is a choice of strategic importance.

A positive formal evaluation is no guarantee for institutional stability. In the political context that PTA has to operate in, more informal but highly relevant ‘evaluations’ can pop up any time – especially just after elections. In 2009, there was a Parliamentary vote from a right wing party to abolish TA-Swiss. However, two thirds of the parliament voted for continuation. The authors of the description of the PTA organisation in Catalonia write that “CAPCIT managed to survive the last regional elections” in 2010. And despite the positive formal evaluation in 2008, in October 2011 the Flemish parliament decided to abolish the PTA organisation by the end of 2012 at the latest. In Denmark, the consolidation of the institute was threatened under a new right-wing government in 2001, suggesting the closure of a wide range of committees, councils and advisory boards. Thanks to a swift parliamentary rescue, the Danish Board of Technology (DBT) escaped closure; however, it suffered a substantial budget cut. Ten years later (2011) the Committee on Science, Innovation and Higher Education negotiated an expansion of the research budget and as part of the financing plan the grant for the DBT was abolished. The political situation around this decision was very complicated, and in the months after the research agreement was decided it turned out that the DBT still enjoyed broad political backup in Parliament, society and the science community – both national and internationally. These facts set the political background for the establishment of “FondenTeknologirådet” – the Danish Board of Technology Foundation, which took over the work of the DBT by mid-June 2012.

Austria

In 2011/2012 the mandate of ITA was adapted with a view to reinforce its relationship with the political sphere; it is to be expected that this will change its institutional position in the medium term.

Catalonia (Spain)

The CACIT platform (with representatives from the scientific, economic, and social sectors) used to have the presidency of the government as main addressee. In 2003, CACIT became formally linked to the parliament. In the following years, research centres offered to strengthen their advice towards the parliament, which found fruitful ground within parliament. As a consequence, the name of the platform for Parliamentary TA was changed from CACIT to CAPCIT (2008), and social and economic sectors were no longer represented in the platform.

Denmark

Having been around for more than 25 years the Danish Board of Technology has been through many organisational changes – from being an experiment, to becoming “permanent”, and lately it is to be transformed into a private non-profit foundation. At the time of writing, the form of the relation between the foundation and the Danish Parliament is to be determined, and it will be decided upon against the background of an upcoming report from the Committee on Science, Innovation and Higher Education in the Danish Parliament.

Flanders (Belgium)

In October 2011, the Bureau of the Flemish parliament approved the conclusions of a political working group that was established to evaluate the future of three autonomous organisations linked to the parliament, para-parliamentary institutes, including IST. Concerning IST, the parliament decided that it will cease to exist on 31 December 2012, and thus stops funding its Parliamentary TA research and advice activities. In July 2012 - after several talks between the Flemish parliament, the Flemish government and IST - the Flemish government decided to transfer the TA activities of IST to the portfolio of the Flemish Institute for Technological research (VITO), a strategic research centre that provides innovative technological solutions and scientifically based advice with strong links to academia, industry and government. This includes a transfer of a significant part of IST's budget from the parliament to the government and an opportunity for the TA practitioners at IST to start working at VITO. At the moment of writing (September 2012), the implementation of the government's decision has yet to be started.

Germany

Institutional changes have been modest. In 2002 (as in the years before, from 1990 to 2002), the Research Center Karlsruhe, which later merged with the University of Karlsruhe into the Karlsruhe Institute of Technology (KIT), was selected to operate the TA office, out of five proposals. In 2008, this contract was extended for another five years, however in cooperation with another organisation (ISI).

The Netherlands

The Minister of Education and Science used to be the first formal addressee, and parliament was the second (1986). Furthermore, the institute was to provide a ‘societal address’, providing access to signals from society. Later (1990), the institute's board and management decided on parliament to be the main addressee, in order to straighten the institute's profile. The Dutch TA organisation has known a renewed inclusion of scientific research, building new bridges with academia. A Science System Assessment research department was installed in 2004, for which the Dutch Cabinet was added as a formal addressee, next to Parliament. Furthermore, it had become policy that senior TA researchers, preferably holding a PhD, were recruited with the aim of doing much of the research in-house. A better visibility is an ongoing demand for the Dutch institute, as asked for in the 1992, 1994, 1999 and 2006 evaluations. The Dutch institute has taken up this challenge by further professionalising and expanding of the communication department. Furthermore, TA researchers receive opinion writing and media training, in order to act as ‘public intellectuals’¹²⁴ in their respective fields of expertise.

Norway

The Norwegian Board of Technology was established on 30 April 1999. In 2002, the regulations were slightly modified, the main change being that the regulations now explicitly state that the board shall assess the *opportunities* that new technologies may represent. For TA-projects, this did not entail any major changes.

Switzerland

After two pilot phases of four years each, politicians voted for the Federal law on scientific research that established PTA as an activity of the Swiss Science and Technology Council (1999). Later (in 2008), the new law on research (there is a new law every four years) established TA-SWISS as an independent competence centre of the Swiss Academies of Arts and Sciences.

Box 11.3 Examples of changed institutional positions for PTA across Europe

¹²⁴ W. Bijker (2003). ‘The Need for Public Intellectuals: a Space for STS. Pre-presidential Address, Annual Meeting 2001, Cambridge, MA’. In: Science, Technology and Human Values 28: 443-450.

In reaction to formal evaluations, political decisions or a renewed organisational strategy, we see organisations that perform PTA move closer to either one of the societal spheres. Such a move may be altered or even partially made undone, in reaction to new developments, years later. Box 11.3 provides examples of such altered organisational positioning for the eight countries investigated.

The continuous search for legitimacy in a constant changing institutional context may be considered an inherent characteristic of an organisation that is installed to mediate between different societal spheres. Once an institute is established, it will always have to defend its status and allocated resources, especially since it operates in the dynamics of daily politics. This can be challenging. In several country descriptions, authors mention an increased demand for PTA, and without additional resources being granted, this puts a pressure on the quality of work. A change in emphasis on any of the societal spheres may be required to meet such challenges.

11.2 Organising Parliamentary TA

Having discussed the institutional issues, we now focus on organisational issues. Our central question is: which actors from which societal spheres are involved in building connections to the outside world? We identify several ‘organisational mechanisms’ by which such connection making takes place. On the one hand, each mechanism enables and constrains the influence parliament, government, science and society can have on the organisation. On the other hand, these mechanisms both enable (because of their legitimizing power) and constrain the activities that the organisation can deploy.

The relative involvement of the four spheres in each of the organisational mechanisms amounts to an organisational model. Box 11.4 lists the mechanisms and models, which we discuss in Section 11.2.1 and 11.2.2.

Organisational mechanisms

- Clientele
- Funding schemes
- Evaluation of the organisation
- Board, Steering Committee, Panel or Platform
- Working programme
- Staff
- Project team
- Project participation
- Project advising and/or reviewing

Organisational model

- Parliament
- Parliament-science
- Parliament-science-society
- Parliament-government-science-society
- Science-government
- Other

Box 11.4. Organisational issues for Parliamentary TA

11.2.1 *Organisational mechanisms of institutionalised Parliamentary TA*

The choice of organisational mechanisms will depend on the formal tasks, the clientele, the further organisational context and the democratic culture. Both the more formal procedures and the more informal routines that have been built up over time are of relevance. With so many variables at stake, there is substantial variety in the organisational modelling of a TA organisation.

The *Clientele* of an organisation has a direct, overall impact on how the organisation is organized. All of the work at an organisation is structured in advance depending on to whether it is to address parliament only, or if the target group is broader. Some organisations focus on parliament solely (European Union: STOA; France: OPECST; Germany: TAB), although they make their products widely available and support the dialogue between their home institutions and the scientific community, as well as with society at large. Other organisations work for parliament and society (Catalonia and Flanders). We see a combination of parliament, government and society as clients for Denmark, the Netherlands, Norway and Switzerland.

Austria is the only organisation investigated for which the science community is an explicit client – on top of clients from the other three spheres.

Funding is the next category of interest. This may involve long-term, basic funding schemes, but also more short term sponsorships on a project level. Exclusive parliamentary funding exists for the European Union (STOA), France (OPECST), Germany (TAB) and the United Kingdom (POST). Exclusive sponsorship from the science & technology community is there in Catalonia (CAPCIT). In Austria (ITA), the Netherlands (Rathenau Instituut) and Switzerland (TA-SWISS), the funding scheme is related to both the governmental and the scientific sphere. We encounter a more dispersed funding pattern in Denmark (as from 2012) and Flanders (until 2012), where parliament, science and society are involved.

The category *Evaluation Committee or Group* refers to the group of people that has the formal task of examining and reporting on the functioning of the organisation as a whole. For organisations that work relatively independent from parliament, this often manifests itself as an Evaluation Committee. This committee may be installed by the government (as happens in the Netherlands, every five year, and in Norway, which was, by exception, being evaluated in 2011), or by the organisation's 'own' steering committee or board (as happens in Switzerland, where this steering committee consists of representatives of the scientific community mainly). The Danish Board of Technology uniquely has two boards (a Board of Governors and a Board of Representatives). One of them takes a more evaluative stance. For these organisations, representatives from different societal spheres are involved in the evaluation procedures. For any type of evaluation, clients and additional stakeholders may be interviewed in order to identify the successes, failures, opportunities and possibilities for improvement.

With organisations that work closer to parliament, it is no surprise that parliamentarians have a stronger say in the evaluation of the organisation. This can be arranged formally, like in Flanders, where the regional parliament installs an evaluation committee, upon the proposal of the organisation's board. Germany, too, there is a formal evaluation, every 3 to 5 years, when parliament decides on the renewal of the contract with a scientific organisation that is to operate the TA office for the next period. STOA's performance is evaluated at least once per 5-year legislative term by the European Parliament's Vice-President responsible for STOA, who submits his/her evaluation report to European Parliament's Bureau. For the UK (POST), Catalonia (CAPCIT) and France (OPECST), no formal evaluation procedures exist. Nevertheless, the general assembly in these parliaments may decide to change internal procedures and routines that affect the organisation, which can be considered as a *de facto* evaluation.

Any of the organisations has a *Board, Committee, Panel or Platform* that has regular interactions (typically about every two months) with the staff that is in charge of performing daily TA activities. We may consider the practical influence of such an entity somewhere in-between steering and advising, on a strategic level. For the European Union (STOA), France (OPECST) and Germany (TAB), this entity consists of parliamentarians only. One commonly finds parliamentarians with a strong background in science among the members of such bodies, as is for example the case for STOA. In Austria (ITA), the board solely consists of science representatives, while in Switzerland (TA-SWISS), the Steering Committee is also strongly attached to the scientific community. A mixture can be found at Flanders and in Catalonia, where half the board or panel consists of parliamentarians and the other half of representatives from the science and technology community. More dispersed patterns of involvement from different spheres exist in other organisations.

Most of the organisations have an annual or bi-annual *Working Programme*, with the aim of clarifying and prioritising interesting themes on which the organisation should focus. Establishing such a programme is a

parliamentarian task for the European Union, as done within the STOA panel, which takes taking request from parliamentarian committees and individual parliamentarians into account. In Germany (TAB), this responsibility is shared between politicians and the scientists from the TA office. At other organisations, we see a stronger involvement from society and government. In addition to internal procedures and routines, - such as discussions with the board or committee -, the draft programmes are often discussed with outsiders, whose advice is incorporated in updated versions. The Austrian (ITA) it is a 3-year scientific research programme partly corresponds to government priorities with regards to solicited research projects, and it is therefore indirectly checked on for its relevance to policymaking. Catalonia (CAPCIT) does not work use a working programme, but priorities are set periodically, at each platform meeting.

By *Staff* we refer to the people who are in charge of the actual Technology Assessment projects. In principle, these people may have ties to any of the four societal spheres: parliament, government, science and society. In practice, most of an organisations' staff are mainly based in science. The inclusion of more communication and (project) management skills in the organisation accounts for the involvement of the societal sphere for Denmark, Flanders, the Netherlands and Norway. The French situation is unique, because it is the only organisation where parliamentarians themselves take up this task. At all of the other organisations, the TA staff has strong ties with science.

Procedures and routines at the project level open up additional assemblages of involvement. The TA staff may outsource an (important) part of the work. For this reason, the *Project Team* is a relevant, additional category, as well as *Project Participation* methods and mechanisms for *Project Advising and/or Reviewing*. These mechanisms are discussed in detail in Section 11.3.

11.2.2 Organisational models of institutionalised Parliamentary TA

Our discussion of organisational mechanisms shows much diversity in the countries and regions we have studied. None of the TA organisations is closely similar to any of the others. But for the aim of discussing the future prospects of Parliamentary TA in Europe, within and beyond the aims of the PACITA project, it is fruitful to simplify this assemblage of options into a limited, coherent number of organisational models.

The mapping as done in the table in Appendix C results in five organisational models. These models clarify the potential differences in the relative involvement of each of the four societal spheres in the way Parliamentary TA is organised. The choice for weight factors¹²⁵ in Appendix C is based on the qualitative information for each organisation, which is listed in Appendix D. This underlying qualitative information is primarily taken from the eight detailed country and region descriptions, which are included in this report. On top of that, representatives from these eight and also from four additional PTA organisations have checked and completed both the qualitative tables (Appendix D) and the choice of weight factors (Appendix C).

We chose to consider each of the nine organisational mechanism as equally important. By summing up the weight factors for all the mechanisms, a graphical representation was created for each organisation. We use these illustrations to illustrate the five organisational models we found. By doing so, we account for the more nuanced differences within each model.

¹²⁵ For a meaningful understanding of Appendix C, some clarification is needed. Most importantly, the objectiveness that the numerical values in the table suggest should not be over appreciated. These numbers are carefully chosen and checked, but nevertheless, some subjectivity was involved. Moreover, one should realise that the table gives a snapshot of each organisation's situation at the time of writing (September 2012); optional upcoming changes in these organisations are not accounted for. For three of the countries and regions in the table that were not part of this study, namely the European Union (STOA), France (OPECST), and the United Kingdom (POST), secondary information was used (Delvenne 2011), completed by a check of a representative from each organisation. For the United States, the information was provided by a representative.

Model 1. Mainly parliamentary involvement in TA

According to Enzing et al., Parliamentary TA in France, Italy, Greece and Finland is organised according to the Parliamentary Committee model. We have not studied the situation in any of these countries in detail. Nevertheless, it is possible to briefly reflect on the situation in France, because ample information can be found in the literature (cf. Vig & Paschen 2000, Delvenne 2011, Enzing et al. 2011).

The Office Parlementaire d'Evaluation des Choix Scientifiques et Technologiques (OPECST) was the first Parliamentary TA organisation in Europe. Van Eijndhoven (1997: 271) argues that of all the Parliamentary TA organisations in Europe OPECST is “the one most intimately linked with parliament, because it is the parliamentarians themselves who conduct the assessments”.

Accordingly, they have integrated TA fully in the committee structure of the parliamentary system in France. The TA project is led by so-called rapporteurs, selected from amongst the members of OPECST and responsible for writing the TA report (Enzing et al. 2011). Rapporteurs can organise hearings and missions in France or abroad. They are assisted by parliamentary civil servants, and if needed, supported by a working group or steering committee consisting of experts outside the parliament. It can be concluded that the French Parliament has chosen a very strong involvement the TA process, that is, they have control over all of the organisational mechanisms that we discussed earlier. Figure 11.2 gives a graphical representation of OPECST, based on the relative involvement of each of the societal spheres.

Tentatively, we also included a representation of the PTA organisations in Finland, Greece and Italy. In these countries, the influence of the scientific community on the work of PTA is expected to be bigger, because in contrast with France, the MPs are not in charge of the actual projects. This implies they are more dependent upon external expertise.

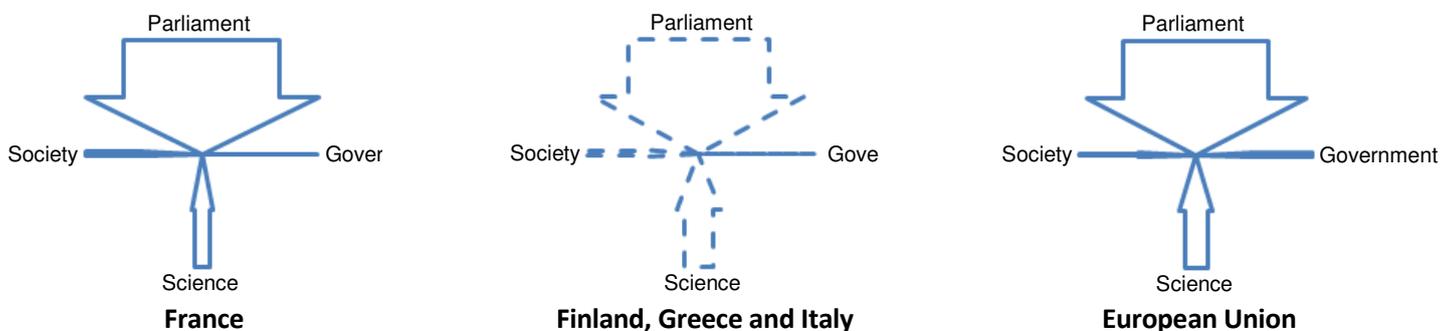


Figure 11.2 Examples of mainly parliamentary involvement in TA (model 1)

Generically speaking, this model also applies STOA, the office for Technology Assessment at the European Parliament. The actual research is carried out by scientists. STOA works with procurement procedures, embedded in a framework contract, for which scientific consortia, experienced with Technology Assessment, can apply on a project-to-project basis (Delvenne 2011). The relatively large involvement of parliament is related to the procedural embedment of STOA projects in the parliamentary administration.

Model 2. Shared parliamentary-science involvement in TA

For the sake of our argument it is interesting to note that the organisational set up of OPECST was discussed from the start (Van Eijndhoven 1997). Inside witnesses remember some thought about an organisational division between two phases: a first phase consisting of an in-depth TA analysis performed by scientists; after this, the parliamentarians would come in to sort out the conclusions drawn up by the scientific experts. According to Van Eijndhoven (1997: 271-272) the MPs “quickly concluded that such a division of labour could not work, because translation of scientific results into policy relevant conclusions is a politically laden activity that requires in-depth knowledge of the issues”. As a result it was decided that parliamentarians should perform the TA themselves, supported by staff. One could typify the original organisational set-up of OPECST as “shared parliamentary-science involvement in TA”.

Our study reveals various ways of organising such “shared parliamentary-science control over TA”. Historically speaking, until its abolishment in 1995, the American Office of Technology Assessment (OTA) resembled this model (see, for example, Delvenne 2011). A current example is Germany, which Enzing et al. (2011) typify as a Parliamentary Office model. In Germany MPs are the exclusive clients of TAB (however, the TAB reports are public and hence feed into society, S&T and governmental spheres). MPs decide about funding and are in charge of the evaluation of the TA unit. MPs select the members of the Parliamentary steering committee, which solely consists of MPs. Moreover, they decide about the topics of the TA studies, and whether the results of the TA studies are accepted for use as input for the parliamentary debate. Furthermore, every 3 to 5 years, the parliament has the option to choose another research institute for carrying out Parliamentary TA. The German situation thus resembles the situation in France. However, there is one crucial difference. The actual TA research, namely, is performed by scientists within TAB, which is established as a scientific institute, and to some extent by outside contractors. The German model for organising TA presents a form of “shared parliament-science involvement in TA”, however, in which the parliament has a strong voice and the final say.

Catalonia presents another form of “shared parliamentary-science involvement”. According to Enzing et al. (2011) Catalonia can be characterised, just like Germany, as an example of the Parliamentary Office or Unit model. CAPCIT is attached to the parliament, but as a mixed body: half of its 18 members consist of MPs and the other half of scientists. Moreover, the scientific community sponsors and performs the TA activities. CAPCIT can be seen as a way to institutionalise the relationship between the Catalan parliament and the S&T community. The PTA organisation in the United Kingdom (POST), though working differently than CAPCIT or TAB in Germany (see Appendix D), is another example of shared parliamentary-science involvement. Figure 11.3 shows current examples of model 2.

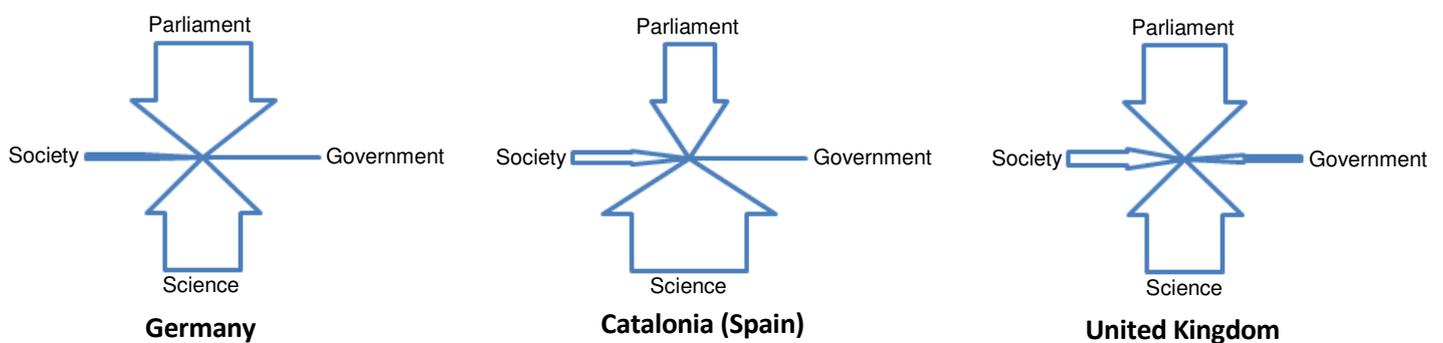


Figure 11.3 Examples of shared parliamentary-science involvement in TA (model 2)

Model 3. Shared parliamentary-science-society involvement in TA

The way Parliamentary TA in Flanders is organised (until the end of 2012) can be characterised as a form of “shared parliamentary-science-society involvement”. Enzing et al. (2011) typify IST in Flanders as an Independent TA institute, just like the TA organisations in the Netherlands, Norway and Switzerland. Our way of typifying TA institutes shows that the way TA is organised in Flanders indeed bears similarities to the situation in other countries, but it also shows some clear differences.

IST in Flanders is set up as a para-parliamentary institute associated with the Flemish parliament. In this sense one could characterise IST as a kind of Parliamentary TA office or unit. But the task of IST is both inform the parliament and to stimulate the public debate. Both the parliament and science have a large say in the way the institute is run. Parliament funds IST and also installs an evaluation committee, mainly consisting of science representatives. Half of the Board consists MPs and the other half of scientists. Besides the parliament, IST in Flanders has the wider public as its formal client. IST puts a lot of effort in stimulating public debate, by means of project participation methods, technology festivals, and communication. Therefore, IST has to foster links between the TA organisation and society. Typifying Parliamentary TA in Flanders as a form of “shared parliamentary-science-society” does justice to the fact that IST has strong links with both parliament and with science and society.

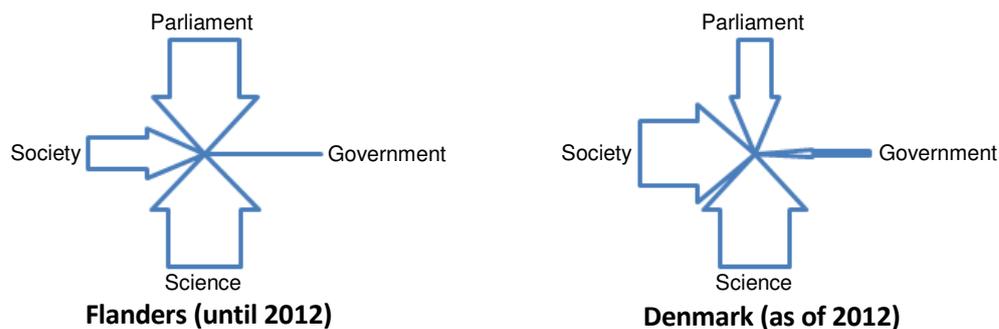


Figure 11.4 Examples of shared parliamentary-science-society involvement in TA (model 3)

Figure 11.4 depicts the Flanders example, together with the Danish one. Although the new foundation structure of the Danish Board of Technology differs significantly from the Flanders situation, in terms of funding, board memberships and how project teams are organised, it adds up to a similar relative influence of the four spheres, nevertheless.

Model 4. Shared science-government involvement in TA

In Austria we find an example of an organisation with a primer on science, where involvement is mainly shared with the government, which is one of the clients and the most important sponsor. The mother organisation is the Academy of Sciences, and together with the scientists of the organisation itself, the scientific advisory board has the most influence on the organisation and the project agenda. They also act as project managers and practitioners and keep the balance between policy consultancy and scientific research. Government, and to a certain extent Parliament, fulfils the role of client on a project basis; societal actors may be the members of project advisory boards. Figure 11.5 shows the Austrian example.

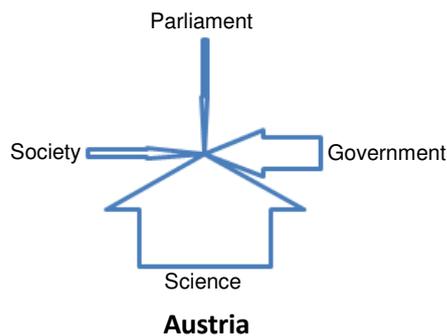


Figure 11.5 Example of shared science-government involvement in TA (model 4)

Model 5. Shared parliament-government-science-society involvement in TA

There is at least one crucial difference between the situation in Flanders and the situations in the Netherlands, Norway and Switzerland. The influence of the parliament on these TA institutes is far weaker. Namely, where IST is funded by the parliament, the other three organisations are funded by the government. Moreover, while half of the Board member of IST consist of MPs, active MPs do not partake in the Boards in the other three countries. This is why Enzing et al. (2011) describe these institutes as being “independent institutes”, referring to their high independence from parliament. The information in Appendix C and D clearly shows that instead of being under the influence of parliament, these institutes are dependent on the government. Significant governmental involvement is also the case for the US Government Accountability Office (GAO), which has taken up Technology Assessment functions, though for that organisation, the parliamentary involvement is clearly stronger.

To counterbalance against too direct governmental influence, the money that is allocated for doing TA in the Netherlands, Norway and Switzerland is buffered. It is earmarked at an institution that is closely related to science. Governmental influence in evaluation procedures for this organisational model may differ, however. In the Dutch and Norwegian cases, the government installs an evaluation committee, mainly consisting of science representatives. In Switzerland, it is the steering committee itself, consisting of science representatives and stakeholders, that calls for an evaluation, and not the government. But TA-SWISS regularly refers to government, as its mission and budget are submitted to Parliament by government every four years. A number of seats in the board, steering committee or advisory committee are reserved for representatives from civil society, in addition to science representatives who are in majority. Finally, in these countries, the government and wider society are included as formal addressees, next to the parliament. In its role as client the parliament has an indirect, but crucial influence on the way the TA organisation functions.

Accordingly, we typify the model of organising TA in the Netherlands, Norway, Switzerland and the United States as “shared parliament-governmental-science-society control”. Figure 11.6 gives the graphical representation for each of these organisations.

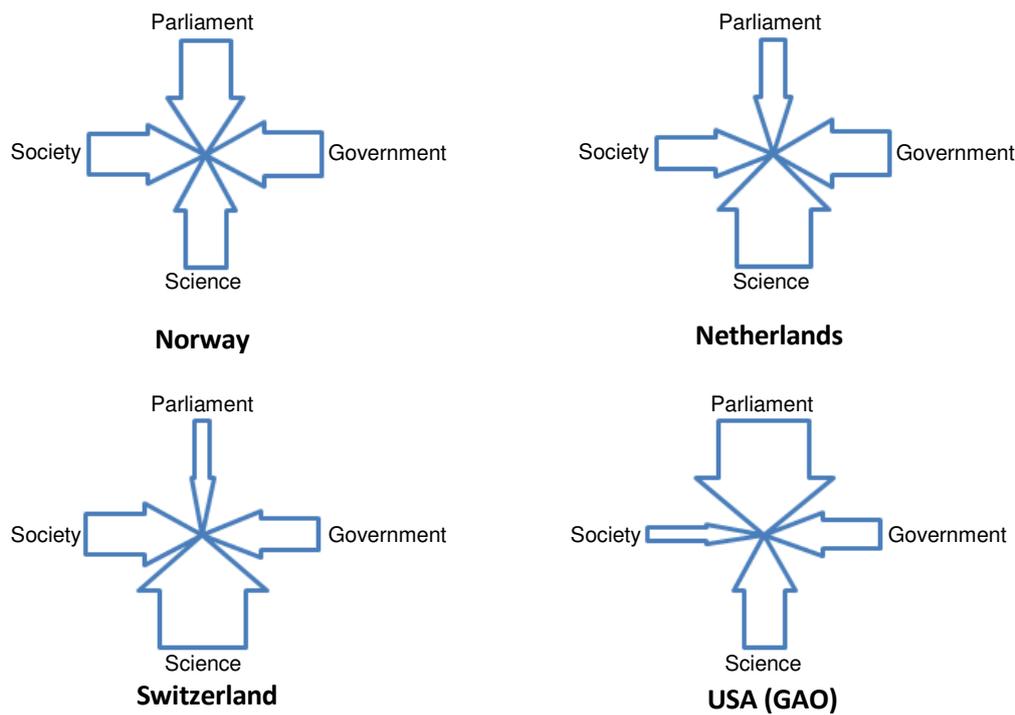


Figure 11.6 Examples of shared parliament-government-science-society involvement in TA (model 5)

Other models

Categorizing the relative involvement of the four societal spheres leads to fifteen potential organisational models for Parliamentary TA. A dominant involvement of either one of the four spheres accounts for four models. A shared involvement of three spheres gives four other options. The shared involvement of two spheres leads to an additional six models. Sharing the involvement between the four spheres gives one other model. In principle, it is possible to build connections to Parliament for all of the fifteen models. This means that all of the potential organisations can, in principle, claim the term Parliamentary TA.

11.3 Performing Parliamentary TA

This section zooms in on the project level, on performing Parliamentary TA. It is especially this level where the impact of the organisation on the outside world will be determined. We follow the lifecycle of a TA project, by looking at four project phases. For each project phase, we aim to clarify how the interaction between the TA institute and the four societal spheres (parliament, government, society and science & technology) is being shaped. Box 11.5 gives an overview of the issues for each phase. We will subsequently discuss them in Section 11.3.1, 11.3.2, 11.3.3 and 11.3.4.

Agenda-setting

- Scope
- Openness
- Quality control
- Framing of topics

Activities

- Expert participation
- Stakeholder participation
- Lay people participation
- In-house versus outsourced work
- Interaction with board, steering committee, panel or platform

Results

- Scientific quality control
- Political quality control
- Communicative quality control

Dissemination

- To the political system
- To the scientific community
- To society at large

Box 11.5 Project issues for Parliamentary TA

11.3.1 Agenda-setting for projects: multiple trade-offs

We found three aspects of setting the agenda in PTA projects for which trade-offs have to be made: (1) the scope of the work agenda, (2) the openness of the work agenda and (3) how quality control of the work agenda is arranged. We will discuss the trade-offs on these three aspects consecutively.

Setting the scope of the work agenda

Scope setting requires at least two trade-offs. One trade-off takes place between trend-setting and trend-following. A PTA organisation can distinguish itself positively from other players in the landscape by choosing subjects in the field of science and technology that are not yet on the radar of policymakers. We may consider at least some of the TA work in Europe done on ‘synthetic biology’ to be an example of this. Such pioneering work aims at reshaping the agenda in the field of ST&I policymaking. At the same time, the relevance of such early signalling activity runs the risk of being too far away from the ongoing debate. Potential audiences may consider the topic interesting, but not yet relevant enough for decision making. The alternative would be to take a more trend-following stance. As an example, we can think of TA work on ‘energy’ and ‘climate change’. We may safely expect such topics to closely match the political agenda for the coming period. This more or less guarantees political relevance. At the same time, the chances for political visibility are lower. Jumping on such a ‘bandwagon’ means that several or even many other players in the field will also address policymakers with research results, new insights and opinions, in the same time period.

The other trade-off for setting the scope takes place between focus and broadness. In the project overviews of the countries and regions that we investigated, we see a broad spectrum of research domains being

covered, ranging from energy, ICT and nanotechnology to genomics, mobility and other domains. Within this broad spectrum, research themes also seem to be passed between organisations throughout Europe. An exception to this overlap is the domain of Science System Assessment, which is included only with the Dutch PTA organisation, though in Austria, such topics are dealt with on a project level. This research domain studies the dynamics of science as such, in terms of upcoming research fields, collaborations between researchers and the career paths of scientists.

Openness of the work agenda

Deciding on the openness of the work agenda requires a trade-off between a systematic approach and reserving staff capacity and finances for ad hoc opportunities. For the investigated countries and regions, we saw that only Catalonia completely relies on the ad hoc approach. In every meeting of the platform, typically two times a year, the represented parliamentarians and spokespersons of the science community decide on which new topic(s) to take up that are considered relevant at that time. The other investigated organisations work have a working programme or project portfolio for one or two years. At the same time, resources are reserved for taking up topics in a more ad hoc fashion. This may be so to react to specific requests of parliament or government.

Quality control of the work agenda

Arranging quality control of the work agenda comes down to deciding on a blend of influences. Ideas and insights may come from PTA staff, or from any one of the four societal spheres we identify in this report: parliament, government, science and society. A process must be organised in which interactions between two or more of these groups take place, leading to a work agenda that is considered 'sound'. Decisions must be made on the responsibilities of the TA staffers, the board, steering committee, panel or platform and the openness of this process to broader circles of influence.

In the investigated countries and regions, the involvement of the government in setting project priorities is limited. The country descriptions show some governmental influence on the work agenda for Norway, Austria and the Netherlands. In Norway, some representatives from the public administration are invited to sessions where ideas about the new project portfolio are discussed. In the Netherlands, the biannual working programme is to be sent to the Minister of Science for approval, which is a formality in practice. At times, there are specific demands from the government, such as a contribution to Knowledge Chambers, which are organised at ministries. We have identified two main types of interaction mechanisms through which the quality of the work agenda may be guaranteed.

The first mechanism for a sound work agenda is a strong 'parliament – TA staff' interaction. In this mechanism, the initiative for taking up topics formally lies with the Parliament. In an iterative process with the TA staff, the work agenda is fine-tuned further. Germany is an example of this. The Parliamentary Steering Committee of the German Bundestag, in which all parliamentary groups are represented, is politically responsible for the Parliamentary TA that is carried out by a contracted research organisation, referred to as TAB. Additional initiatives come from other parliamentary committees, that ask the parliamentarian Steering Committee to set up a study on a subject. At times, societal groups lobby with MPs to get their interests reflected in TAB's agenda. There is strong interaction between the parliamentary 'TA rapporteurs' (who are members of the parliamentary Steering Committee and, optionally, from other committees) and TAB staff, under the guidance of the chair of the Steering Committee. Selected and reorganised proposals are accepted when a third of the Steering Committee does not oppose it.

The second mechanism for ensuring a high quality work agenda may be labelled ‘TA staff – other spheres’ interaction. Within this mechanism, substantial variation is possible on the further levels of influence. In Switzerland, Norway, the Netherlands, Flanders and Germany, trend watching by the TA staff is an important basis for the new project portfolio. From there, interaction with the board or steering committee takes place. Depending on the composition of this board or steering committee, a window of influence is opened for mainly the science community, and other stakeholders (as in the Netherlands and Switzerland), both science and parliamentarians (as in Flanders) or broader spheres (as in Norway). On top of that, additional circles may get mobilised for ‘agenda checking’. In the Netherlands, the Royal Academy of Sciences and the Scientific Council on Government Policy (WRR) are to be consulted, for establishing the biannual working programme. In addition, a Programme Council has recently been installed. In Flanders, several stakeholders are invited to comment on the work agenda, and parliamentary committees are also consulted. In Switzerland, off-duty politicians are included in the process. The Norwegian Board of Technology deliberately opens up the agenda-setting process by inviting stakeholders and the general public to propose subjects, as did the Danish Board of Technology. In the new foundation setting of the Danish Board of Technology it is envisaged that the work programme will be co-created with a wider network, including the establishments and financing of projects.

Framing of topics

The examples of Parliamentary TA projects throughout this report, which have been carried out at the different organisations, illustrate the importance of how research topics are framed. A great deal of the work in scanning trends, selecting relevant themes for TA and communicating with the outside world is related to how problems are perceived in the field of governing science, technology and innovation.

11.3.2 Project activities: bridging expertise with signals from society

In this section, we clarify the main types of project activities, and how they may be combined and further detailed out. The two main activity types are research (desktop and interviews) and the organisation of more active forms of stakeholder participation. In a PTA project, research and participation may be mixed, with the aim of reinforcing one another. People planning a PTA project have to decide on the balance between these two fields of activities. It must also be determined which share of the activities will be done in-house, by TA staff, and which share of the work will be contracted out. This is strongly related to considerations of budget and staff capacity. We distinguish three potential mechanisms that can shape this decision process: the interaction between TA-staff and parliament, the interaction between TA-staff and a board or steering committee and, thirdly, the interaction between TA-staff and external researchers. In a project, they may be combined.

Blending research with participation

In all of the investigated Parliamentary TA organisations, research is at the heart of the work; balanced, well-documented fact and opinion finding takes place. These research activities may be expanded by further mobilization of actors. One or more of the four societal spheres we distinguish in this report – parliament, government, science and society at large – may be enabled to actively participate in the project. The main options we distinguish for doing so are expert, stakeholder and lay people participation. In a project, they may be combined.

All forms of participation are highly suited for mapping societal diversity, but they face challenges in mapping consensus. If organisations that perform PTA claim political, societal or scientific representativeness, it will mostly be a claim of including as many relevant viewpoints on the matter as one can find, if not all. But consensus on any of these viewpoints, as a research finding, is a rare result. It is not easy to find out to what extent viewpoints are shared or backed up by researchers in other domains, by citizens, or by other stakeholders who were not included in the PTA process.

Expert participation may range from basic consultation to a strong advisory role. In Germany, there is a round of intensive expert consultation at the start of a project. In Germany and also the Netherlands, interim results are discussed in meetings where scientific experts are present. In Switzerland, Flanders and the Netherlands, the involvement of experts is pushed further into a formal advisory role. The board (Switzerland) or staff (the Netherlands, Flanders) installs a support group or an advisory committee, in which at least one board member participates. They meet a number of times during the project. A relevant consideration when expanding the expert scope is the balance between well-established voices, which can speak with authority, and the inclusion of upcoming voices that might shed unexpected light on the matter. Norway has a stronger format. So-called “expert groups” play a key role in NBT projects. The groups are recruited by the NBT staff for each individual project. Members typically come from industry, academia, NGOs and interest groups, in addition to one member of the NBT board. These expert groups are intensively involved in the project, usually meeting six to eight during a project, with four to twelve months typically elapsing between the first and last meetings. The members take active part in framing and assessing the topics and reviewing draft reports. Thereby, they are project participants, and serve as advisors or reviewers of the projects at the same time.

Stakeholder participation may range from automatic inclusion in the project to an active search for ‘silent’ voices: stakeholders or citizens that are not confronted yet with the new scientific or technological development that is being examined in the project. For some organisational settings, a number of parliamentarians participates by definition. In Germany and Flanders, this happens through active involvement of the parliamentary steering committee or MPs in the board. In Norway, Switzerland and the Netherlands, and in some projects in Austria a number of seats in the board or steering committee is reserved for representatives beyond the scientific community. On top of such organisational arrangements, there is a certain freedom for selecting additional stakeholders. On the one end, we see the Catalanian case, with hardly any additional stakeholder involvement, and on the other end Norway, with approaches, like scenario workshops and open hearings, strongly aimed at stakeholder participation. As said, Germany, in some projects Austria and the Netherlands organise meetings in which interim results are discussed, for which representatives of societal groups are often also invited. Civil society organisations may also be represented in support, advisory or expert groups. For example, this is the case for Switzerland, where advisory groups supporting the various projects comprise both experts and stakeholders. A relevant consideration in expanding the stakeholder scope is the balance between key decision makers and actors that are less influential. Should an environmental organisation be invited in the project, if its opinion on the matter is already well known throughout society? Is it important for the project to build bridges with policy makers on the local level?

Lay people participation may range from actively organising it to hooking up to external events. We speak of ‘lay people’, because such participation methods mainly deal with early developments where citizen groups have not yet organised and informed themselves for the purpose of pressurising the political system. TA staff has several methods at their disposal for organising lay people participation, well documented in literature. In a project, such methods can be combined. Through informed inquiries, a representative sample of society

may be asked to formulate an opinion on a development in science and technology. Another option is to invite the public to share their experiences by sending their stories to the PTA organisation that publishes them. By organising focus group sessions, TA staff has a chance to get more in-depth insights into the arguments that certain citizen groups use. Another option is to organise a multi-day event. This is usually referred to as ‘consensus conference’, where a panel of citizens jointly works towards policy advice. During this event, experts are usually present to provide scientific support. Science cafes and technology festivals are aimed at reaching a broader audience, enabling them to participate in discussions. For such public events, it makes sense to cooperate with partners that provide a bridge with a specific citizen group. This could be a debating centre at a university, or a media partner that covers the event in the newspaper or on the Internet. The PTA organisation could also decide to position itself mainly as a bridge towards politics, without further involvement. By exception, the Catalonian CAPCIT hooked up to an external citizen participation event, by presenting the results to parliamentarians.

Decision making on project activities

A prime consideration in planning a project is the balance between in-house and outsourced work. This is strongly related to budget considerations. Internal staff is costly. Hiring external personnel temporarily has the benefit of covering a broad area of interests. The Catalonian PTA platform is a special case, because it works without a budget. This means that all research is delegated to external research organisations by definition. This may be one of the research organisations, represented in the platform. Optionally, another organisation is approached. Either way, the research is unpaid for. In the other countries and regions we investigated, we see nuanced combinations of internal work and outsourcing. Several types of outsourcing exist, which have in common that they open up the project to influences from external researchers.

Against this nuanced background, we can distinguish three types of interaction patterns that, influence decision making on the project level. Decisions on project activities are based on interactions (1) between TA staff and parliament, (2) between TA staff and board or steering committee, and (3) between TA staff and external researchers. We discuss them below. In practice, combinations are possible.

For the ‘TA-staff - parliament’ interaction, the initiative lies with the TA office. Project plans are fine-tuned together with parliamentarians. The German situation exemplifies this type of interaction. The German TAB office takes the first step in implementation of projects, after which parliamentary clients are consulted. After some basic research and expert consultation, TAB makes recommendations to the parliamentary steering committee on the kind of expertise required from external experts or scientific organisations.

Another relevant interaction takes place between ‘TA-staff – board, platform, panel or steering committee’. The board, platform, panel or steering committee is involved in further detailing and in the approval of the project plan. In Switzerland, a member of TA staff will write a more detailed paper after his or her brief proposal is approved by the board. In Flanders, members of staff also start the brief proposal of a subject to the board. This initial project description is based on several justification criteria, including why the project is relevant for Flemish policy making, and why the TA institute should conduct this project, instead of another organisation. After board approval, the TA staff prepares a more elaborate description. In the Netherlands, there is board approval of a detailed project plan (including budget, method description and communication strategy), which is also written by the TA staff.

Outsourcing of work implies ‘TA-staff - external researchers’ interaction. Norway is the only case investigated where almost by definition the project managers write the reports – be it in strong interaction with ‘expert groups’ comprising external experts and stakeholders. In Catalonia, it is just the opposite: all

reports are written by external researchers. Priorities are discussed within the Catalonian CAPCIT, after which the responsibility for implementation is delegated to the research institute that will produce the report. In the other countries and regions we investigated, we see nuanced combinations of internal work and outsourcing.

In some other organisations, there is a logical division between research (desktop and interviews) on the one hand, and participation methods on the other hand. In Flanders and Switzerland, research is outsourced, except for participation methods for which stakeholders and/or citizens are recruited. In these three countries, TA staff members work primarily as research project managers. Nevertheless, these project managers have strong research backgrounds, and also reporting duties for the participatory events that are organised.

At other organisations, other cuts between in-house and outsourced work are made. In the German and Dutch situation, the TA staff preferably consists of academic researchers, carrying out much of the research in-house. In addition to this, these two institutes hire expertise, for which budget is available. This has the benefit of easily accessible and controllable research as well as the benefit of the best available researchers, tailored to specific project needs. A downside of doing such a substantial share of the research in-house is the time consuming character of it.

Contracted external researchers may heavily influence the priority setting within a project. In Flanders, a request for tender is usually opened, following the Flemish, Belgian and European procurement procedures. Further detailing out the project plan is done by the parties that react to the request. In the end, the best-suited project plan is selected. In Switzerland, too, we see recruitment through open tenders. Selection of proposals is done by the board. In the Netherlands, there is a combination of a targeted approach to researchers and, at times, a request for tender. Selection of researchers is done by TA staff.

11.3.3 Project results: careful translation of facts and opinions to relevance for debate

The fine tuning of products can be understood as a process of quality control. But for the ‘boundary work’ that PTA entails, there are no clearly marked sign posts of undisputed quality. A dispersed set of quality indicators comes into play. A balance must be found between scientific quality, political quality and the quality of communicating for a much broader audience. On top of that, in practice there is often a thin line between advising on project and reviewing a project’s draft products.

Scientific quality control of products

The quality control of every PTA organisation must be from an academic perspective. It is the basis on which future definitions of policy relevance and translations towards the public debate are made. If the academic foundation is not sound, the prime legitimacy of the organisation is at risk.

Ensuring scientific quality entails having tight connections with the scientific community. Norms and values of certain branches in science must be incorporated, in terms of proper methods, proper argumentation and proper referencing. This creates scientific credibility. In the field of Technology Assessment, this is an inherently challenging endeavour. It is a multidisciplinary field, for which no clearly defined scientific standards exist. TA has added value exactly when confronting social sciences, including political sciences, ethics, economy, philosophy, engineering and natural sciences. At the same time, this confrontation evokes critique. It invites scientists from different branches, who each frame the research differently, to criticise the results from their own stance. It is often impossible to reconcile the norms and standards for each of these

contributing branches in a single TA study. Nevertheless, connections with different branches must be made, in order to create a robust result.

Organisations have different possibilities of connecting to science. We found three options, which may be combined. One option is to employ scientists, either as TA staff or on a contract basis. The strategy of employing scientists as staff is explicitly followed in Germany and the Netherlands, but also in Flanders, Norway, Switzerland and Austria, where staff has a strong background in research. In addition, researchers are hired. Another option is to mobilise external peer review. Scientists in the board, steering committee, expert or advisory group provide such functionality. Especially in Switzerland and Norway, the steering committee or board, with mainly science representatives, has the ultimate decision power in determining the final products. In addition, other experts may be invited to comment on the work. As an alternative, third option, the responsibility for the scientific quality of the work can be delegated to the institute that performs the research. This is the case in Catalonia. Publishing in peer-reviewed journals is followed as a main strategy for building and maintaining scientific credibility, in only one of the investigated organisations (Austria).

Political quality control of products

Ensuring the political quality of research products entails building connections with the political system. The fact that Technology Assessment looks at medium and long term developments requires a translation to daily politics. Norms and values that are relevant to the political culture of a specific country or region need to be incorporated. In building such connections, there is a thin line between serving and creating politics. The process of the political framing of the research product is challenging, because the organisation runs the risk of being accused of taking a political stance, instead of providing unbiased information.

At the heart lies a feel for politics, which every member of PTA-staff is expected to have. The political antennae of staff may be developed further by specific training. Courses exist on how the political system works, that explain the interplay between parliament and government and practices for lobbying by pressure groups.

An important question is which actors, ongoing debates and policy dossiers in the political system the research products should connect. All types of Parliamentary TA address parliament, but connections to specific spokespersons or standing committees can be relevant. In addition, the relevance for other parliaments (national, regional, European), the government (nationally, regionally, locally), public authorities or agencies (especially for safety and health issues) or social partner associations must be taken into account.

Connections to elements of the political system can be made by having policymakers comment on a draft report, or by explicit reference to policymaking in the text, or by combinations of these. By such connection making, the political legitimacy of the research product is increased. The way this is organised is not neutral. It ultimately determines to what extent the political nature of the report is made explicit for to the reader of the text.

We identified four types of connections to the political system. The first is 'strong procedures – limited textual reference.' This resonates with the German situation. Representatives of parliament may accept or reject the results. Draft reports are discussed with clients and approved of by Parliamentary TA rapporteurs. In addition, discussions take place on draft reports with ministry representatives and public authorities. Alternative options for the policy-making process are developed, which the authors of the report evaluate

from a broad societal perspective, but no political stance is taken by the PTA organisation. Which elements to choose for further political debate is explicitly left open for politicians to decide. It is mainly the procedure that provides the research product with political legitimacy, not the references to politics in the text.

The second type of connection to the political system is 'mixed procedures - textual reference'. This resonates with the Flemish situation. The Flemish organisation (until 2012) fine-tunes documents in terms of length and in terms of balance between background information and a stronger focus on policy implications and policy recommendations. Until 2008, research products were presented to the board, half of which consisted of MPs. This procedure became replaced by other means of interaction. For this type of connection to the political system, both procedures and textual reference provide the research product political legitimacy.

The third type is 'limited procedures – strong textual reference'. This is often the case for PTA research in The Netherlands. A framing of the political nature of the investigated development in ST&I is often included in the research report as such. This may lead to specific advice for politicians for choosing a certain direction within the available options. At times, the organisation even takes a provocative stance, strongly calling for political action. Nevertheless, such a call for action is often addressed to the government – and not parliament as such. This provides parliamentarians ammunition to ask the government for clarification in a political debate. In this type of connection making to the political system, it is mainly the textual reference that provides the research product political legitimacy, and not the procedure as such.

The fourth type is 'limited procedures – limited textual reference'. This resonates with the Catalan case. Parliamentarians that are part of the CAPCIT platform contribute to the project selection, but they are not involved in the discussing draft reports. It is up to the institute that carries out the research to decide to what extent they want to refer to political decision making explicitly.

Communicative quality control of products

Improving communicative quality entails making the product available for a broader audience. This means that the use of policy jargon and scientific jargon is limited. However, pushing this too far runs the risk that the organisation becomes perceived as too popularising, downplaying political and scientific legitimacy. Not only politicians, but also NGOs, expect Parliamentary TA reports to be unbiased sources of reference in political decision making.

Organisations may include some fierce checks on readability and relevance to a broader public. Several organisations we have investigated employ communication staff for such a task. In the Dutch case, communication developed into an additional department, made up of six people. In addition to in-house expertise, professional writers (journalists) may be hired. Such writers are trained in restructuring a text, to convey a clear message for the reader.

11.3.4 Project dissemination: searching for the right format and entry

In some organisational settings, parliamentarians will receive research products automatically. But in many cases, it is relevant to think about a strategy for further dissemination. In such a strategy, an estimation of when and where relevant debates will take place is important. To some extent, the successful dissemination of publications can be monitored, by counting references to work of PTA.

The research products may be further disseminated to the political system (parliament and government), the scientific community or society at large. Several options exist for reaching these potential target groups. We discuss them subsequently.

Dissemination to the political system

Monitoring the parliamentary agenda is daily practice for PTA staff. Several options exist to actually bringing a publication to the political debate.

Contributions to parliamentary meetings may be aimed for. Depending on the organisational setting, this can be a standard procedure. In Germany, the final report is issued as one of the formal printed papers of the German parliament, obliging MPs to deal with each report in committees and plenary sessions. For further 'air time' in the political debate, the parliamentary invitation is mainly a formality. Interim results are presented before parliamentary committees. Other organisations aim for such contributions, optionally for specific parliamentary working groups or parliamentary hearings. Parliamentarians that are more familiar with the TA project may serve as ambassadors. Especially for the organisations that work more independently from parliament, such as the Rathenau Institute in The Netherlands, TA-SWISS and the Norwegian Board of Technology, continuous effort is required to stay on the political radar, creating chances for capitalizing the work that has been done.

Organising a meeting for parliament may serve as an alternative. Presentations before MPs or complete standing committees are arranged (Norway, Netherlands) and at times, meetings are organised in cooperation with parliamentary committees (Denmark, Netherlands), or workshops for politicians are organised (Switzerland).

Informal parliamentary contacts are of aid to further disseminate results to parliament. For all of the organisations, it is corporate policy to ensure that publications reach representatives of all parliamentary groups. In its most elementary form, a report is handed out to the appointed representatives of each political party in the current legislature period. Next, each party decides its own strategy. From there on, the ambassadorship of a single or a few MPs may work as a political multiplier for work of the PTA organisation, with the risk of being seen as politically coloured. An alternative entrance is to build bridges with the parliamentary staff. The registrar of a standing parliamentary committee often has an important say in the formal agenda. Inviting politicians as 'special guests' to an event that is related to a project is also a well-known strategy. An organisation's board or steering committee may have an important role in facilitating such contact with politicians.

The translation of research products into policy briefs is another way of increasing the chance of impact in parliament. PTA work competes with huge piles of other information, and a busy parliamentary schedule. In the Netherlands, Switzerland and Norway, policy briefs, abridged versions and information brochures, which are written in a more journalistic style, are prepared. TA-SWISS also offers fact sheets on certain topics.

In addition to parliamentary clients, the work of PTA may be disseminated to governmental bodies. This comes at the potential price of downgrading the unbiased status of information or advice towards parliament. An option that partially solves this is to always inform parliamentarians first. This is explicit policy for the Norwegian organisation.

Dissemination to the scientific community

When the project is over, the research product (such as a report or book) can be distributed to relevant experts. A growing list of these experts may be kept during the project. People that are present at expert groups or advisory meetings during the project often become important ambassadors when the project ends. Broader events may be organised during the project or as an event to launch the product, for which experts are invited.

An obvious way to reach the scientific community is to publish in peer reviewed journals. The original report is turned into an academic publication. While this is a main aim for the Austrian TA institute, TA staff from other institutes may sometimes opt for this (e.g. in the Netherlands). In Germany, the situation is different, but routes to academic publishing are well-known, because the German TA office operates as part of an academic research centre. In the German speaking countries, there is also the “Netzwerk TA”, where scientists share TA research results. In general, experts can also be reached by publishing in more popularised trade journals.

Another option is to intervene in processes of research and design. Interestingly, Parliamentary TA intervenes in science, technology and innovation policy, but the direct intervention of Parliamentary TA in the actual practices of techno-scientific design is low. Historically speaking, this is remarkable. In the ideology and agenda-setting phase of institutionalising Parliamentary TA, the desire to directly intervene in research and development practices was put forward by several advisory committees and politicians in the Netherlands, in the 1970s and 80s. Societal reflection for design and ethics rules in research were proposed. This approach is sometimes referred to as Constructive Technology Assessment (CTA).

Dissemination to society at large

Taking the German organisation as an example, we see that all TAB reports are published on the website, final reports are published as printed matter for the parliament and that selected reports are published in a book series. On top of that, there is a newsletter about ongoing work, published twice a year and sent to a broad range of interested research organisations and other stakeholders. Furthermore, there is a newly established format for public committee meetings and other public events in the parliament, on final results of TAB projects. The German case exemplifies that all of society can receive ‘open access’ to Parliamentary TA work, which is primarily aimed at serving parliamentarians’ needs. Other institutions also publish their results on several platforms.

Research products may be accompanied by or converted into other means, with the aim of making them more attractive to a broader public. In addition to publishing research, organisations may initiate launching events, debates or ‘technology festivals’. These events can be open to, or even specifically aimed at society at large.

Coverage in newspapers and magazines, on the Internet, radio and television may also be aimed for. The investigated organisations actively aim for such media coverage, with the exception of the Catalanian case. Much of the debate on developments in science and technology has transferred to the Internet. The

investigated organisations, except for Catalonia, use Internet for publishing results. These are free to download. Several organisations publish newsletters. On top of that, PTA organisations may decide to actively take part in ‘social media’ (Facebook, Twitter, LinkedIn), which is the case in The Netherlands and Austria.

Popularising research products, by making them fit for media platforms, requires specific skills. Illustrators may come into play. Branding and corporate style publishing is important. A journalistic style of writing may be needed. Employing communication officers is a way to incorporate such skills into the organisation. In addition, TA staff may be trained, for instance in writing opinion articles. Media training may also be offered – generically or specifically tailored and timed at the moment a publication is launched. This is the case for the Netherlands.

Media coverage can be an aim in itself, when it is the organisations task to stimulate societal debate. But it can also be a way to get the attention of politicians. In modern society, there is strong cross-fertilisation between politics and multimedia coverage. Events where politicians give statements create news. Journalists may even be more interested, when such an event is organised in, or even by parliamentarians. In general, politicians heavily depend on media coverage for building and maintaining political support from society. Especially ‘Twittering’ on the Internet makes it possible for parliamentarians to have their thoughts multiplied instantly. This relationship with the media also works vice versa. When a PTA project creates massive media attention, it becomes an ‘obligatory point of passage’ in the political arena. In such cases, pressure grows. This makes it harder for politicians to simply neglect the publication.

For organisations that perform PTA, this strong interrelationship between politics and media is a fact. But given this context, there is substantial space to act. Aiming for media coverage can range from sending out a press release to a balanced campaign strategy, designed at the core of the PTA project (see case description for the Netherlands). Options in-between involve organising press conferences and giving a limited number of interviews.

The path of substantial media coverage may serve as an ‘efficient detour’ in getting the attention of politicians, but it becomes risky when pushed too far. We encounter a dilemma between ‘triggering the crowds’ versus ‘affecting the relevant decision makers’. At times, political controversies may only be enlarged by a highly visible approach, which relies heavily on the results of PTA projects being newsworthy. In such cases, the desirable role for PTA may be more to act as a mediator ‘under the radar’, and try to build bridges between parties, so as to overcome different visions and interest they have.

11.4 Challenges for existing Parliamentary TA organisations

A number of challenges for existing Parliamentary TA organisations has become apparent throughout the study. These can be grouped in terms of finances and client management (Section 11.4.1), the relationship to discourses on science, technology and innovation (Section 11.4.2) and internationalisation (Section 11.4.3).

11.4.1 Finances and client management

An important challenge for existing organisations is to sustain financial resources. Against the background of the economic crisis, parliaments and governments may face fierce negotiations on budget reductions. The annual budget of Parliamentary TA organisations, typically just over one million euros per annum, is

negligible against the major financial challenges ahead, commonly expressed in billions of euros. Nevertheless, organisations may be directly affected negatively by such political negotiations.

In order to increase the robustness against budget reductions, several organisations have already set in a diversification strategy. Part of the work may be funded by ministries, as happens for instance in Austria and the Netherlands. Research funds, both on a national and a European level, provide additional opportunities. Nevertheless, there is always the risk of a cessation of funding, given the fact that most organisations that perform Parliamentary TA – a public function – are greatly dependent upon one major sponsor: either parliament or government.

The expected successful Danish and Flemish transformation into alternative organisational settings shows that alternative funding schemes are viable, but are likely to change an organisation's client portfolio. The new foundation structure in Denmark is more like a consultancy, for different types of stakeholders. In Flanders, a financial solution is found by transferring a significant part of the organisation's budget from parliament to government. This enables Parliamentary TA functions to be taken up at the existing Flemish Institute for Technological Research (VITO). At the time of writing (September 2012), the question is especially whether the task of stimulating the public debate on developments in science and technology will be part of the new mission. At the German, Austrian and Catalonian organisations, there is a countermovement that tries to address the general public more rather than less. In the absence of a direct (financial) incentive, further opening up to society happens slowly.

Not only new clients, but also the existing clientele requires continuous organisational attention. Connections with parliament need to be updated constantly. Especially for the re-established Flemish and Danish organisations, which are further away from parliament now, ways for reconnecting are sought for. In the Austrian case, the organisation aims at strengthening its hitherto weak formal relations with parliament. But for other organisations too, connecting to parliament is still perceived as an ongoing challenge. Important reasons are that often after elections there are different political spokespersons, and that politicians' time schedules are always overloaded. The proactive involvement of parliamentarians in TA projects is helpful. Being organisationally closer to parliament (as is the case in Germany and in Catalonia) strongly facilitates this connection making, but it is still no guarantee for broad political impact. Existing organisations wish to strengthen connections to and within Parliament, without drifting away from other policy-oriented developments in science and technology.

Translating impartial research into client-oriented advice is an ongoing challenge for all organisations. Timing (fast results versus in-depth studies), focus (clients' agendas versus the internal research agenda) and format (complexity versus a clear policy message) need to come together. In the European landscape of Parliamentary TA, experience was gained with several mechanisms for balancing the powers between (parliamentary) clients and independent (scientific) TA research (see Section 11.2). Translating sound research into policy relevance is an inherent to performing TA, which will also require continuous attention in the future.

11.4.2 Relationship to discourses on science, technology and innovation

In Section 11.1.1, we argued that Parliamentary TA has been legitimised as a solution for institutional problems in the relationship between parliament, government, science and society. Thus, when the framing of problems in this field changes, a Parliamentary TA organisation is challenged to re-orientate itself. Technology Assessment has its own vocabulary, built up over the years. At the same time, many of the

methods and ways of performing TA' is 'tacit knowledge'. At times this makes TA in general, and specifically the added value of TA for policy making, hard to grasp for an outsider. Technology Assessment is highly respected, but soft selling.

Building bridges to other discourses is perceived important for increasing TA's visibility and impact. Examples of such vocabulary, highly relevant for policymaking, are the 'Top Sectors' in the Netherlands, the 'Flanders in Action breakthroughs', the 'Catalan 2020 strategy' and the European 'Horizon 2020' innovation programme. The relationship to other policy oriented assessment frameworks is also relevant. Outsiders will not be familiar with nuanced differences between Technology Assessment and impact assessment, risk assessment, ethical assessment or foresight studies. Rooted in academic spheres, there is substantial terminology that touches upon TA. Examples are 'responsible innovation', 'governance of innovation', 'upstream engagement' (early inclusion of stakeholders in policymaking), and 'evidence-based policymaking'.

Not only the changing content of discourses needs attention, but also its changing character. Who debates when, where, how and for which audience? The new media reality reshuffles such categories continuously. Information sources become diffuse, social media is everywhere, journalism tends to be more superficial and traditional media lose terrain. This fact of life offers (Parliamentary) TA new opportunities and threats.

One opportunity is that new research methods become available. An example is the Norwegian Board of Technology, which explores ways of online public participation, expanding the circle of people involved in surveys by several orders of magnitude. A second opportunity is that 'broadcasting' your message as an organisation becomes easier. So many media channels have become available. This also enables specific target groups, such as spokespersons in politics, to be reached more directly.

An organisational threat is that it has become less clear when and where public debate and political opinion forming takes place. These happen both inside and outside parliament, both in the 'real' and 'virtual' world, possibly at the same time and cross-referring to one another. So where can an organisation most fruitfully invest – given the limited resources it has at hand? What does 'fast' journalism have to offer for nuanced, knowledge-based reporting on TA projects? Nuanced conclusions after sound - scientific - research often do not match with the one-liners in social media. A TA organisation easily risks its message to be misinterpreted. TA needs to find its way in this new media world.

Organisations constantly face the question of how Technology Assessment relates to such evolving discourses. There is a tendency to take additional topics and media on board. At the same time, the need for a clear focus is felt. Traditionally, Technology Assessment takes a broad, multidisciplinary approach, both thematically and methodologically. In line with this tradition, the TA community is very open to meet any additional, upcoming demands. One example of this is the further aligning of Technology Assessment task with Science System Assessment tasks, which takes place at the Dutch organisation. Another example is the tendency of the German organisation to meet a growing need for studies on innovation policy. On the one hand, practitioners of Parliamentary TA will always be reluctant to expanding their tasks, in order to keep focus. On the other hand, the ambition to do so is there, not in the least because broad, integral assessments are key to the identity of TA. The need for external funding may drive some organisations further on the path of task expansion.

11.4.3 Internationalisation

Another important challenge for Parliamentary TA organisations is the internationalisation of relevant topics and governance structures. Serious up taking of ‘grand challenges’, such as climate change, sustainable energy supply and public health requires policymakers to take a global perspective. The relevance of the national and regional policy levels is limited for some topics. For European member states, an important part of the legislation is made in Brussels. In reaction to these trends, existing Parliamentary TA organisations have started to further reach out to European and international policy levels. The EPTA network, ETAG consortium and the PACITA project are examples of this. The participating Parliamentary TA organisations can translate such transnational insight back to local relevance.

11.5 Conclusions and implications

This study, within the PACITA context labelled as ‘Task 2.1 TA Practices in Europe’, has laid bare the many political, strategic and practical choices involved in institutionalising, organising and performing Parliamentary TA. Section 11.5.1 sums up the main findings, while Section 11.5.2 and 11.5.3 discuss the implications for countries and regions that already have Parliamentary TA, and for new organisations, respectively.

11.5.1 New open modelling of Parliamentary TA

Our study modelled Parliamentary TA in a new and open way. This open modelling has further revealed the large organisational variety found in Parliamentary TA. A relatively new insight is that this organisational variety goes hand in hand with great institutional flexibility. The fact that Parliamentary TA can take such different forms creates opportunities to embed it at different locations in the existing institutional landscape.

Parliamentary TA is positioned at the interplay between parliament, government, science and society. In contrast to existing literature, the modelling does not presume the relationship to Parliament to be the dominant feature of a Parliamentary TA organisation. Our underlying assumption is that all of the four societal spheres are, in theory, important. To what extent these spheres are involved in the work of Parliamentary TA needs to be studied empirically. Organisations that look different when judged on their formal relationship to parliament may have many similarities when looked at their connections to other spheres. This makes the modelling highly emancipatory.

Our study confirms the importance of taking all four societal spheres into account. The analysis of the dynamics on the institutional, organisational and project level reflects that connections to all the four spheres are being made. Even for organisations that are embedded ‘inside’ parliament, building and maintaining credibility towards the ‘outside’ spheres of science & technology, society and government is important.

The open modelling can easily be expanded towards other types of TA, such Governmental TA (mainly aimed at ministries or other governmental bodies) or Constructive TA (mainly aimed at practices of R & D). Such demand outside parliament offers fruitful pathways for diversifying the financial basis for existing Parliamentary TA organisations. The work done at existing organisations is already much broader than the label “Parliamentary TA” suggests. The actual need for changing the ‘business model’ depends on the national or regional embedment. Nevertheless, the reality is that public funds are under pressure everywhere in Europe, because of the financial crisis.

When establishing Parliamentary TA we should not only think in terms of establishing new institutions, but also in terms of further developing existing ones. The open modelling enables new countries and regions to map the ‘opportunity structure’ for TA in general, and Parliamentary TA in particular. It does not *a priori* exclude TA activities that are not aimed at parliament (yet). It can be used as a tool to map existing TA and TA-like activities in a country or region. It can also map institutional structures that are capable of taking (Parliamentary) TA functions on board.

Our new way of modelling, addressing the dynamic interplay between parliament, government, science and society, leads to fifteen potential organisational models for Parliamentary TA. All these different models have options for addressing the work, at least partly, at parliament. The differences between the models are based on the relative involvement of either one of the four societal spheres: parliament, government, science & technology, and society. For the countries and regions investigated, we identified five organisational models, which are listed in Table 11.2.

<i>Model 1</i>	<i>Model 2</i>	<i>Model 3</i>	<i>Model 4</i>	<i>Model 5</i>
Mainly parliamentary involvement in TA	Shared parliament-science involvement in TA	Parliament-science-society involvement in TA	Science-government involvement in TA	Parliament-government-science-society involvement in TA
<ul style="list-style-type: none"> • Finland • France • Greece • Italy 	<ul style="list-style-type: none"> • Catalonia (Spain) • European Union • Germany • United Kingdom 	<ul style="list-style-type: none"> • Flanders (until 2012) • Denmark (as of 2012) 	<ul style="list-style-type: none"> • Austria 	<ul style="list-style-type: none"> • Norway • The Netherlands • Switzerland • USA

Table 11.2 Five organisational models for Parliamentary TA

11.5.2 Framework for reflection

We have studied the involvement of parliament, government, science and society concerning institutionalising, organising and performing Parliamentary TA. Throughout this final chapter, we have made explicit much of the tacit knowledge, routines and choices on these three levels. This is the result of joint efforts of all PACITA partners, including an important part of the community of Parliamentary TA practitioners in Europe. The outcome is a common vocabulary that facilitates mutual discussions between countries and regions. We may call it a common framework for reflecting on an organisation’s contribution to knowledge-based policymaking in the field of science, technology and innovation (Table 11.3).

INSTITUTIONAL LEVEL	ORGANISATIONAL LEVEL	PROJECT LEVEL
<p>Societal problems</p> <ul style="list-style-type: none"> Which problems are perceived with developments in science, technology and innovation (ST&I)? <p>Institutional tasks</p> <ul style="list-style-type: none"> Which tasks should the organisation take up, in order to address these problems? Optional tasks include: <ul style="list-style-type: none"> Perform broad, interdisciplinary impact analyses of developments in ST&I. Be relevant for policymaking on ST&I Involve society in ST&I. Watch trends in ST&I. Build bridges between actors in the field of ST&I. Contribute to ethical, humane and sustainable ST&I. <p>Political support</p> <ul style="list-style-type: none"> How to mobilise and maintain long term political support for the organisation? <p>Further evolution</p> <ul style="list-style-type: none"> How to keep the organisation responsive to changing demands? 	<p>Organisational mechanisms</p> <ul style="list-style-type: none"> Clientele Funding schemes Evaluation of the organisation Board, Steering Committee, Panel or Platform Working programme Staff Project team Project participation Project advising and/or reviewing <p>Organisational model</p> <ul style="list-style-type: none"> Parliament Parliament-science Parliament-science-society Parliament-government-science-society Science-government Other 	<p>Agenda-setting</p> <ul style="list-style-type: none"> Scope Openness Quality control Framing of topics <p>Activities</p> <ul style="list-style-type: none"> Expert participation Stakeholder participation Lay people participation In-house versus outsourced work Interaction with board, steering committee, panel or platform <p>Results</p> <ul style="list-style-type: none"> Scientific quality control Political quality control Communicative quality control <p>Dissemination</p> <ul style="list-style-type: none"> To the political system To the scientific community To society at large

Table 11.3 Framework for reflecting on an organisation’s contribution to knowledge-based policymaking in the field of science, technology and innovation.

11.5.3 Implications for new countries and regions

A new Parliamentary TA organisation does not get established out of the blue. For new countries and regions, the most important implication of our study is that institutional structures, existing locally, may provide ample opportunities for establishing Parliamentary TA. This is strongly related to the high level of organisational variety we encountered among countries that have already established Parliamentary TA. The organisational variety goes hand in hand with high institutional flexibility. Proponents of establishing Parliamentary TA can use the organisational variety to their benefit, in order to maximise chances of an organisation becoming established in the already existing, wider institutional landscape.

The open model, developed in this study, is of aid in making explicit the existing ‘opportunity structure’ for Parliamentary TA in new countries and regions. The model provides an open view to where the demand and ambassadorship for Technology Assessment lies. Fruitful ground for initiating Parliamentary TA can be found either close to parliament, government, society or science, or in a combination of those spheres. Public controversies with regard to science, technology and innovation are likely to be a game changer, increasing chances of a Parliamentary TA organisation becoming established.

In order for Parliamentary TA to take off, it is important to fit in with local discourses on the governance of innovation. These discourses matter, because they frame what politicians and other relevant decision makers

perceive as problematic at this moment in time. Parliamentary TA may provide partial answers to the identified problems. The vocabulary that policy makers and academics use for matters in the field of science, technology and innovation may vary considerably from country to country and from region to region. Though the principle of Technology Assessment is highly appreciated by many stakeholders, it has proven to be soft selling at the same time. Proponents of Parliamentary TA can only benefit from such ‘windows of opportunity’ if they manage to connect TA vocabulary to the discourses that are currently locally relevant.

An experiment with Parliamentary TA, in a protected space, limited in time and scope, can build trust in the wider network. In this respect, it is always important to build connections to Parliament. However, too much focus on the Parliament may lead to dismissing other relevant options for Technology Assessment, elsewhere in the field. A ‘smart detour’, both in time and institutionally, may ultimately be needed to reach Parliament or other relevant stakeholders.

New countries or regions may actually establish a (Parliamentary) TA organisation beyond an experimental stage. When this happens, the reflection framework we developed in this study (Table 11.2) may inspire further discussions. The framework is of aid in exploring which organisational model best meets the current local demands. We found five models of Parliamentary TA to exist across Europe. In principle, ten additional models for Technology Assessment exist, from which also bridges to Parliament can be built over time. In any case, the establishment of a Parliamentary TA organisation is expected to be a long-term endeavour, requiring long-term support from committed believers. The organisational model is likely to change along this evolutionary path.

When discussing the most appropriate organisational model for that moment, it is important to have realistic expectations. Parliamentary TA is unlikely to cause impacts such as an earthquake. Much of its value lies in informing decision makers and, optionally, fuelling public debate. A large part of this impact will always stay below the surface.

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Appendix A Formal task description for investigated PTA organisations

Country/region	Formal tasks
Austria	<ul style="list-style-type: none"> • ITA is an interdisciplinary research institute that analyses technological change, with a view to its underlying societal conditions, the options available for shaping this change, and the impacts that may result from it. ITA's academic work seeks to better understand the societal relevance of technology and to develop further the methodological basis of technology assessment. • An essential element of technology assessment methodology is the inclusion of various bodies of knowledge, values and interests via participatory procedures. Internal project teams, often in collaboration with external partners, carry out interdisciplinary and transdisciplinary scientific analyses. • The aim of applied and scientifically-oriented technology assessment is to generate knowledge relevant for decision-making and to identify intended and unintended consequences of development options. This knowledge is targeted at supporting politics and administration, on the one hand, and at the general public on the other hand. • Since 2012 ITA is given the task to reinforce its activities towards advising politics and outreach into society.
Catalonia (Spain)	<ul style="list-style-type: none"> • To improve the somewhat weak scientific and technical knowledge of parliamentarians and Catalan society in general. • To channel the participation of the main scientific and technical organisations to guide and develop the Parliament's stance on matters of science and technology. • To cooperate and collaborate with the organisations, organisations, universities and other organs and organisations active in the fields of science and technology, and also to coordinate these tasks • To promote co-responsibility in public policies on science and technology
Denmark	<ul style="list-style-type: none"> • To follow technological developments. • To carry out studies and comprehensive assessments on the possibilities and consequences of technology for society and the citizen. • To initiate independent technology assessments. • To communicate the results of the work to parliament, government, other political decision-makers in society and to the Danish population... • ... in order to support public debate on technology.
Flanders (Belgium)	<ul style="list-style-type: none"> • The institute first has to investigate the different ethical, legal, and social aspects and impacts of S&T developments that are relevant for the decision-making process. • Related to this, it has to initiate a constructive debate with relevant stakeholders and possibly with the general public. • Finally, these two elements have to provide information and attitudes that are translated into knowledge and recommendations for parliamentarian's use. • As such, viWTA/IST tries to contribute to an increasingly knowledge-based policymaking on science and technology issues.
Germany	<ul style="list-style-type: none"> • To analyse the potentials of new scientific and technological developments and explore the associated opportunities, • To examine the framework conditions for implementing scientific and technological developments, • To analyse potential impacts in a comprehensive forecast, pinpoint the opportunities offered by using a technology and indicate the possibilities for avoiding or reducing its risks. • All this is the basis for the development of alternative options for the policy-making process. • Contribute to public debate.

Country/region	Formal tasks
Netherlands	<ul style="list-style-type: none"> • The role of the institute is to contribute to societal debate and the formation of political opinion on issues that relate to or are the consequence of scientific or technological developments. • This specifically includes the ethical, social, cultural and legal aspects of such developments. • In particular, the institute facilitates the formation of political opinion in both chambers of the Parliament of the Netherlands and in the European Parliament. • The institute continues to work on increasing our understanding of how science works as a system, and, in so doing, integrating all available data and making it more easily accessible as well as acquiring any data that remains unavailable. • As part of this process, it is the role of the institute to make information available to the Dutch Cabinet, to both chambers of the Parliament of the Netherlands, and to the relevant actors in the world of science, whether requested to do so or not. • The institute seeks to establish connections with relevant societal actors while carrying out its work. • To enhance the way in which it fulfils this role, the institute may widen its field of activity and seek to establish connections with, for example, counterpart organisations across Europe. • The institute may conduct research, or have research conducted on its behalf, in order to support its activities.
Norway	<ul style="list-style-type: none"> • Identify and analyse major technological challenges and contribute to a humane and sustainable technological development. • Monitor international trends, developments and activities within technology assessment and technological foresight. • Actively stimulate public debate on technology related issues and thereby raise public awareness concerning the impacts and options of technology. • Initiate reports and holistic assessments of the potential benefits and consequences of specific technologies for both individual citizens and the society at large. • Communicate the results of its work to the Parliament, governmental authorities and the wider society.
Switzerland	<ul style="list-style-type: none"> • Delivering to the parliament and the government analyses and recommendations on politically relevant technology subjects • Mandate for early detection of technological developments. • New and controversial technologies will be examined with respect to their social, ecological, economic, juridical, social and ethical effects in a way as broad and independent as possible. • TA-SWISS fulfills this mandate by means of expert's studies and participatory procedures (co-operation procedure with the population in the form of PubliForum, publifocus and PubliTalk). • The interdisciplinary studies and the related abridged versions are directed to the decision makers in politics and economy as well as to the wide public. • The same is valid for the recommendations and results from the participatory procedures.

Appendix B

List of interviewees

Catalonia
<ul style="list-style-type: none">• Mrs. Clara Blasco, participant in the citizen forum "Young Europeans Science Parliament"• David Bueno, researcher in Genetics (University of Barcelona)• Mrs. Montserrat Capdevila, Member of Catalanian Parliament• José Antonio Coto, Member of Catalanian Parliament• Joan Gummà, Deputy Chairman of Abantia• Mrs. Dolors Batalla, Member of Catalanian Parliament, member of CAPCIT.• Ferran Domínguez, Lawyer and civil servant in the Catalanian Parliament, secretary of CAPCIT.• Mr. Tomàs Molina, president of the Catalan Council of Science Communication (C4), member of CAPCIT.
Denmark
<ul style="list-style-type: none">• Birgit Jäger, Professor at the Roskilde University Center, Department of Society and Globalisation• Søren Duus Østergård, Director, Duus Communications Aps• Hans Müller Pedersen (director) Ander Hoff (special adviser) of the Danish Agency for Science, Technology and Innovation (DASTI)• Eva M. Weinreich-Jensen, Senior Advisor, Danish Regions, Health Care and Social Affairs• Ida Andersen, Senior Project Manager DBT• Lars Klüver, Director DBT
Flanders (Belgium)
<ul style="list-style-type: none">• Paul Berckmans, director of the Foundation Innovation & Work (StIA - Stichting Innovatie & Arbeid)• Bart Van Malderen, member of the Flemish Parliament• Peter Raeymaekers, science journalist• Lieve Goorden, professor at the University of Antwerp.• Robby Berloznik, director of the viWTA/IST• Lieve Van Damme, communication and coordination officer of viWTA/IST• Johan Evers, senior project manager at viWTA/IST
Germany
<ul style="list-style-type: none">• Edgar Göll, social scientist, Institute for Future Studies and Technology Assessment (IZT)• Steffi Ober, NABU (Nature and Biodiversity Conservation Union)• Manfred Ronzheimer, science journalist• Thomas Petermann, deputy director at TAB• Reinhard Grünwald, senior researcher at TAB• Claudio Caviezel, junior researcher at TAB• Katrin Gerlinger, junior researcher at TAB
Netherlands
<ul style="list-style-type: none">• Marianne Kuil, policy advisor at the Dierenbescherming (NGO for animal welfare)• Oscar Kuipers, professor at the University of Groningen (Life Sciences)• Henk Jan Ormel, former Member of Parliament• Marjan Slob, science journalist• Jan Staman, director of the Rathenau Instituut• Antoinette Thijssen, head Communication Department at the Rathenau Instituut• Ira van Keulen, senior project manager at the Rathenau Instituut

Norway

- Alfred Holmelid, Member of Parliament
- Matthias Kaiser, former director of National Committee for Research Ethics in Science and Technology
- Ellen Veie, Research Council
- Jon Fixdal, project manager at NBT
- Tore Tennoe, director of NBT

Switzerland

- Martin Buechi, head of the section 'Scientific and juridical basis' at the Feral Office of Public Health FOPH
- René Longet, former Swiss MP and former president of the NGO Equiterre, Geneva,
- Kathy Riklin, former scientist and now Swiss MP, member of the 'Committee for Science, Education and Culture' of the National Council.
- Astrid Stuckelberger, psychologist and gerontologist at the Centre Médical Universitaire, Geneva
- Sergio Bellucci, director of TA-SWISS
- Susanne Brenner, communication manager at TA-SWISS
- Adrian Ruegsegger, biologist and head of the Biotechnology and Medicine field at TA-SWISS

Appendix C

**Relative involvement of societal spheres in PTA organisations
(sheet with weight factors)**

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Appendix D

Involvement of societal spheres in PTA organisations described

Country or region	SUM	Clientele		Funding		Evaluation Committee or Group		Board, Committee, Panel or Platform		Working Program		Staff		Project Team		Project Participation		Project Advising and/or Reviewing Group		
		Formal clientele	1,00	Origin	Control	Members	Stakeholders interviewed	Appointed by	Authorship	Advice	Members	Appointed by	Members	Appointed by	Members	Invited by				
Austria	9,00	0,20	1,00	0,40	1,00	0,50	1,00	0,50	1,00	0,33	1,00	0,50	1,00	0,50	1,00	0,20	1,00	0,10	1,00	
		0,40		0,30		0,50		0,50		0,67		0,50		0,50		0,20		0,20		0,10
		0,10		0,10		0,10		0,33		0,50		0,50		0,50		0,60		0,20		0,40
Catalonia	9,00	0,50	1,00	0,50	1,00	0,25	1,00	0,33	1,00	0,50	1,00	0,50	1,00	0,50	1,00	0,17	1,00	0,50	1,00	
		0,50		0,50		0,25		0,33		0,50		0,50		0,50		0,33		0,50		0,50
		0,50		0,50		0,25		0,33		0,50		0,50		0,50		0,33		0,50		0,50
Denmark (as from 2012)	9,00	0,40	1,00	0,20	1,00	0,10	1,00	0,10	1,00	0,10	1,00	0,10	1,00	0,10	1,00	0,20	1,00	0,10	1,00	
		0,20		0,40		0,15		0,20		0,10		0,20		0,75		0,10		0,30		0,40
		0,40		0,40		0,25		0,20		0,10		0,30		0,25		0,40		0,40		0,50
European Union	9,00	1,00	1,00	0,50	1,00	1,00	1,00	1,00	1,00	0,50	1,00	1,00	1,00	0,50	1,00	0,40	1,00	0,70	1,00	
		1,00		0,50		1,00		1,00		0,50		1,00		1,00		0,05		0,15		0,15
		1,00		0,50		1,00		1,00		0,50		1,00		1,00		0,15		0,15		0,15
Flanders (until 2012)	9,00	0,50	1,00	0,50	1,00	0,33	1,00	0,50	1,00	0,40	1,00	0,80	1,00	0,25	1,00	0,25	1,00	0,20	1,00	
		0,50		0,17		0,22		0,11		0,40		0,20		0,25		0,50		0,20		0,25
		0,50		0,50		0,11		0,11		0,20		0,20		0,20		0,50		0,50		0,10
France	9,00	1,00	1,00	0,50	1,00	1,00	1,00	1,00	1,00	1,00	1,00	1,00	1,00	1,00	1,00	1,00	1,00	0,95	1,00	
		1,00		0,50		1,00		1,00		1,00		1,00		1,00		0,70		0,20		0,05
		1,00		0,50		1,00		1,00		1,00		1,00		1,00		0,20		0,20		0,05
Germany	9,00	1,00	1,00	0,50	1,00	1,00	1,00	1,00	1,00	0,50	1,00	0,50	1,00	0,50	1,00	0,50	1,00	0,90	1,00	
		1,00		0,50		1,00		1,00		0,50		1,00		1,00		0,10		0,10		0,10
		1,00		0,50		1,00		1,00		0,50		1,00		1,00		0,40		0,50		0,10
Netherlands	9,00	0,50	1,00	0,05	1,00	0,10	1,00	0,10	1,00	0,10	1,00	0,20	1,00	0,40	1,00	0,20	1,00	0,20	1,00	
		0,20		0,85		0,40		0,10		0,20		0,10		0,20		0,20		0,20		0,20
		0,30		0,10		0,10		0,10		0,40		0,50		0,50		0,40		0,40		0,50
Norway	9,00	0,80	1,00	0,20	1,00	0,50	1,00	0,15	1,00	0,15	1,00	0,67	1,00	0,45	1,00	0,20	1,00	0,45	1,00	
		0,10		0,20		0,10		0,05		0,15		0,33		0,30		0,30		0,55		0,55
		0,10		0,10		0,10		0,05		0,15		0,33		0,30		0,30		0,55		0,55
Switzerland	9,00	0,30	1,00	0,5	1,00	0,10	1,00	0,50	1,00	0,10	1,00	0,70	1,00	0,50	1,00	0,30	1,00	0,30	1,00	
		0,30		0,50		0,20		0,10		0,50		0,30		0,30		0,30		0,30		0,30
		0,30		0,30		0,10		0,10		0,30		0,30		0,30		0,30		0,30		0,30
United Kingdom	9,00	1,00	1,00	0,50	1,00	1,00	1,00	0,33	1,00	0,33	1,00	1,00	1,00	1,00	1,00	1,00	1,00	1,00	1,00	
		1,00		0,50		1,00		1,00		0,33		1,00		1,00		0,50		0,33		0,50
		1,00		0,50		1,00		1,00		0,33		1,00		1,00		0,50		0,33		0,50
United States (GAO)	9,00	0,80	1,00	1,00	1,00	0,90	1,00	1,00	1,00	1,00	1,00	0,20	1,00	0,40	1,00	0,40	1,00	0,50	1,00	
		0,10		1,00		0,10		0,10		1,00		0,60		0,40		0,40		0,50		0,50
		0,10		1,00		0,10		0,10		1,00		0,20		0,40		0,40		0,50		0,50

CATALONIA (SPAIN)
CAPCIT
Parliament
Government
Science
Society

Clientele	Funding	Evaluation Committee or Group
<ul style="list-style-type: none"> • Procedurally embedded in regional parliament • Informing and stimulation of opinion forming 	<ul style="list-style-type: none"> • Contributing research institutes pay out of their own pockets 	<ul style="list-style-type: none"> • By regional parliament • New regional elections directly relevant

Board, Committee, Panel or Platform	Working program	Staff
<ul style="list-style-type: none"> • Half of the CAPCIT committee consists of MPs • All parties are represented 	<ul style="list-style-type: none"> • CAPCIT committee sets priorities 	<ul style="list-style-type: none"> • Some parliamentary administrative support

Project team	Project participants	Project Advising and/or Reviewing Group
<ul style="list-style-type: none"> • Research carried out by institutes on a voluntary basis 	<ul style="list-style-type: none"> • Optionally organized by institution, carrying out the research • Exceptionally, hooking up to external participatory events 	<ul style="list-style-type: none"> • Optionally organized by institution, carrying out the research

Project Advising and/or Reviewing Group	Project participants	Project team
<ul style="list-style-type: none"> Depends upon project setup 	<ul style="list-style-type: none"> Parliamentary hearings Future Panel with parliamentarians Collaboration scheme for projects expected 	
<ul style="list-style-type: none"> Depends upon project setup 		
<ul style="list-style-type: none"> Depends upon project setup Internal evaluations Reviewing through seminars Evaluation by participating experts 	<ul style="list-style-type: none"> Interdisciplinary expert assessments 	<ul style="list-style-type: none"> Employees Contracted experts possible Volunteers from thematic platforms
<ul style="list-style-type: none"> Depends upon project setup Review through seminars External planning group external process Evaluation by participants 	<ul style="list-style-type: none"> Participatory assessments Interdisciplinary expert and stakeholder assessments. 	<ul style="list-style-type: none"> Volunteers from thematic platforms

Board, Panel or Platform	Working program	Staff
<ul style="list-style-type: none"> Parliament can appoint 1 member if it wishes so Parliament can appoint 2 members of the Board of Representatives. Thematic platforms will be set up with potentially participants from MP's, MEP's, Regions, municipalities (and other actors – see below) 	<ul style="list-style-type: none"> Through membership of the two boards 	
<ul style="list-style-type: none"> Not likely for internal Boards. May join thematic platforms 	<ul style="list-style-type: none"> Through thematic platforms 	
<ul style="list-style-type: none"> Yes, in Board of Representatives May join thematic platforms 	<ul style="list-style-type: none"> Through Board of Representatives membership. Through thematic platforms 	<ul style="list-style-type: none"> Independent corporate foundation carrying out Technology Assessment
<ul style="list-style-type: none"> Yes, in Board of Representatives May join thematic platforms. 	<ul style="list-style-type: none"> Through Board of Representatives membership. Through thematic platforms. 	<ul style="list-style-type: none"> Independent foundation carrying out Technology Assessment.

Clientele	Funding	Evaluation Committee or Group
<ul style="list-style-type: none"> Communicate work to parliament Optionally, parliamentary Research Committee as liaison European Parliament/STOA Panel (for STOA projects) Regional and Municipality parliaments a project clients Demand-driven project based relation to Parliament and its committees is expected to be set up 	<ul style="list-style-type: none"> Funding for 1/2 year transition into foundation structure At moment of reporting, unsure for period afterward Optionally, funding on project basis from Committees, Regions, Municipalities, European Parliament (through STOA/ETAG) 	<ul style="list-style-type: none"> Board of Foundation Board of Representatives through 2 yearly meetings Evaluation in autumn 2013 on the project based relation to Parliament expected
<ul style="list-style-type: none"> Communicate work to government Client on a project basis 	<ul style="list-style-type: none"> Grants to foundation possible 	
	<ul style="list-style-type: none"> Grants to foundation possible Funding from (European) research programs 	<ul style="list-style-type: none"> Through Board of Representatives membership, on yearly assembly
<ul style="list-style-type: none"> Communicate work to political decision-makers in society Communicate to Danish population Can establish programs/projects with any societal actor, including organizations, enterprises, unions, international organisations etc. 	<ul style="list-style-type: none"> Grants to foundation possible As a Corporate Foundation, income from commercial activities will be used to fund common good activities of the Foundation 	<ul style="list-style-type: none"> Through Board of Representatives membership, on yearly assembly. Optionally, user surveys & feedback on satisfaction

DENMARK (as from 2012)	DBT
Parliament	
Government	
Science	
Society	

EU	STOA Parliament	<ul style="list-style-type: none"> European Parliament solely 	<ul style="list-style-type: none"> European Parliament 	<ul style="list-style-type: none"> European Parliament 	<ul style="list-style-type: none"> STOA Panel, consisting of fifteen MEPs By STOA Panel Any Member, committee, or other body of the European Parliament may propose Committees are invited, every year, to suggest topics 	<ul style="list-style-type: none"> STOA Secretariat (10 people, including 4 administrators and a seconded national expert with scientific background, employed by the European Parliament) 	<ul style="list-style-type: none"> STOA Secretariat (one responsible administrator per project), under the supervision of one or more Panel members per project. All contracts signed by Director responsible for STOA 	<ul style="list-style-type: none"> One or more Panel Members supervise the execution of each project 	<ul style="list-style-type: none"> Selected by STOA 	<ul style="list-style-type: none"> Selected by STOA
	Government									
Science					<ul style="list-style-type: none"> Most STOA Panel members have a background in science and/or technology 		<ul style="list-style-type: none"> All studies outsourced, through framework contract (consisting of 8 lots), currently with four first-ranked contractors, including KIT (5 lots), IEEP (1 lot), ISIS (1 lot) and Technopolis (1 lot), and three second-ranked contractors, including KIT (3 lots), Consultrans (1 lot) and IVAM UvA BV (1 lot). Several events are co-organised by STOA and outside organisations (e.g. Annual Lecture) by STOA alone. 	<ul style="list-style-type: none"> Expert participation 	<ul style="list-style-type: none"> Expert audits of STOA projects (JRC, European scientific or technical organisations/associations, potentially also through a framework contract) 	
	Society							<ul style="list-style-type: none"> Stakeholder participation 		

FLANDERS (BELGIUM), until 2012 IST Parliament	<ul style="list-style-type: none"> Information and attitudes translated into knowledge and recommendations for parliamentarians' use Filtering on the decision-making process in regional parliament European Parliament/STOA Panel (for STOA projects) 	<ul style="list-style-type: none"> Approval of proposed final annual budget by plenary session in the regional parliament Approval of proposed indicative multiannual (4 years) budget by plenary session in the regional parliament Half yearly control of the budget by the regional parliament Board decides on the budget first (consisting half of MPs) Some funding on a project level from European Parliament (through STOA/ETAG) 	<ul style="list-style-type: none"> Regional parliament commissions the external evaluation (included in the Decree founding the institute) The board proposes the evaluators and the regional parliament approves the evaluators 	<ul style="list-style-type: none"> Half of the board consists of MPs All political parties represented Chairman board= MP 	<ul style="list-style-type: none"> Parliamentary committees are consulted Working Program approved of by the board 	Staff	Project team	Project participants <ul style="list-style-type: none"> MP's are invited to take part in events and outreach activities Project results are fine tuned with first in parliamentary committee(s) 	Project Advising and/or Reviewing Group <ul style="list-style-type: none"> Seldom there are MPs in project advisory committees After the 2007/2008 evaluation the board does not play an advisory role on project level during Board meetings (corporate governance structure)
Government		<ul style="list-style-type: none"> Some funding on a project level from European Commission (through Framework Programmes) 			<ul style="list-style-type: none"> Representatives from governmental bodies are consulted during the multiannual trend analysis and monitoring, and during preparatory phase of new project proposals to avoid overlap and to stimulate information exchange 				<ul style="list-style-type: none"> Project advisory Committee, consisting of some representatives from governmental bodies when applicable

FLANDERS (BELGIUM), until 2012 (cont.) IST	Science		<ul style="list-style-type: none"> Board (consisting half of science representatives) decides on the budget first 	<ul style="list-style-type: none"> Three scientists appointed in the external evaluation committee Some scientific members of the board are interviewed during the evaluation 		<ul style="list-style-type: none"> Half of the board consists of representatives the strategic research councils 	<ul style="list-style-type: none"> Monitoring of trends by TA staff, consulting other (international) TA practitioners Working Program approved of by the board (consisting half science representatives) 	<ul style="list-style-type: none"> TA staffers employed by IST Staffers have a strong background in research 		<ul style="list-style-type: none"> IST staffers design project and manage the project's life cycle Most part of the actual TA research is outsourced. TA advise activities are coordinated internally by IST but project experts can be invited to participate in parliamentary committee hearings Participatory methods, and/or the organization of public events are developed and implemented by IST staffers 	<ul style="list-style-type: none"> Expert participation 	<ul style="list-style-type: none"> Project advisory Committee, with some scientists when appropriate After the 2007/2008 evaluation the board does not play an advisory role on project level during Board meetings (corporate governance structure) 	<ul style="list-style-type: none"> Project advisory Committee, with some representatives from wider society when applicable
	Society	<ul style="list-style-type: none"> Initiate a constructive debate with relevant stakeholders... and possibly with the general public 		<ul style="list-style-type: none"> Several stakeholders consulted 			<ul style="list-style-type: none"> Stakeholder participation Citizen participation Organization of public events 	<ul style="list-style-type: none"> Involvement of science journalists 					

FRANCE OPECST Parliament	Project team	Project participants	Project Advising and/or Reviewing Group
	<ul style="list-style-type: none"> MPs (rapporteurs) in charge of carrying out TA projects. Usually two rapporteurs (with an attempt to respect a balance between National Assembly and Senate, majority and opposition). Assisted by OPECST staff parliamentary civil servants 	<ul style="list-style-type: none"> Optionally, parliamentary debate on the subject before the report is final 	<ul style="list-style-type: none"> Report validated by the Board of OPECST
		<ul style="list-style-type: none"> Expert hearings are organized when deemed necessary Public hearings when deemed necessary 	<ul style="list-style-type: none"> Parliamentary rapporteur surrounded by heterogeneous steering committee In addition, OPECST has a Scientific Council for support (24 members)

FRANCE OPECST Parliament	Board, Committee, Panel or Platform	Working program	Staff
	<ul style="list-style-type: none"> Consisting half of deputies and half of senators (equal representation of both chambers — 18 each). Proportional representation of political groups, on a voluntary basis 	<ul style="list-style-type: none"> Work carried out only on formal request by National Assembly and Senate 	<ul style="list-style-type: none"> MPs in charge of TA projects Two parliamentary secretariat agencies available: one in the National Assembly and one in the Senate

FRANCE OPECST Parliament	Clientele	Funding	Evaluation Committee or Group
	<ul style="list-style-type: none"> Work carried out only on formal request by National Assembly and Senate 	<ul style="list-style-type: none"> Through annual budget, with an equal contribution from National Assembly and Senate 	<ul style="list-style-type: none"> No formal evaluation: OPECST is considered as Parliament-in-action will only be changed when parliament decides to change existing structures and routines

FRANCE OPECST Parliament	Government	Science	Society

GERMANY	Parliament	Government	Science	Society										
GERMANY	TAB	Parliament	Government	Science	Society	Project Advising and/or Reviewing Group	Project participants	Project team	Staff	Working program	Board, Committee, Panel or Platform	Evaluation Committee or Group	Funding	Clientele

GERMANY	Parliament	Government	Science	Society										
GERMANY	TAB	Parliament	Government	Science	Society	Project Advising and/or Reviewing Group	Project participants	Project team	Staff	Working program	Board, Committee, Panel or Platform	Evaluation Committee or Group	Funding	Clientele

GERMANY	Parliament	Government	Science	Society										
GERMANY	TAB	Parliament	Government	Science	Society	Project Advising and/or Reviewing Group	Project participants	Project team	Staff	Working program	Board, Committee, Panel or Platform	Evaluation Committee or Group	Funding	Clientele

GERMANY	Parliament	Government	Science	Society										
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NETHER- LANDS RATHENAU I.	Parliament	<ul style="list-style-type: none"> Stimulation of the formation of political opinion in Second Chamber... and in the First Chamber... ... and in the European Parliament 	<ul style="list-style-type: none"> Some funding from European Parliament on a project level (through STOA/ETAG) 	<ul style="list-style-type: none"> One former politician in 2012 external Evaluation Committee 	<ul style="list-style-type: none"> Active MPs excluded At least one board member with ties to politics appointed 	<ul style="list-style-type: none"> Program Council, consisting of people with ties to politics, advises Involvement of board Working Program sent to Parliament by Minister of Science 	<ul style="list-style-type: none"> At times, meetings are organized for parliament 	Project Advising and/or Reviewing Group
	Government	<ul style="list-style-type: none"> Some work carried out for ministries or administrations The Dutch Cabinet is a formal client for the Science System Assessment department 	<ul style="list-style-type: none"> Ministry of Education, Culture and Science (OCW) Some additional funding from other ministries or administrations at a project level 	<ul style="list-style-type: none"> Ministry of OCW the board members, after consultation of the Royal Academy of Sciences (KNAW) and the Scientific Advisory Council on Government Policy (WRR) At least one board member with ties to politics appointed 	<ul style="list-style-type: none"> Program Council, consisting of people with ties to politics, advises Involvement of board Working Program to be approved of by Minister of Science 	<ul style="list-style-type: none"> Some participation of representatives from government in projects 	<ul style="list-style-type: none"> Optionally, representatives from governmental bodies take part in a project advising committee 	
	Science	<ul style="list-style-type: none"> Stimulating societal debate Strong media focus 	<ul style="list-style-type: none"> Governmental budget earmarked at the Royal Academy of Sciences Some European research funding at the project level 	<ul style="list-style-type: none"> Self-evaluation by staff Three scientists in the 2012 external Evaluation Committee 	<ul style="list-style-type: none"> The Royal Academy of Sciences (KNAW) and the Scientific Advisory Council on Government Policy (WRR) advises on appointments Mainly scientists in the Board Some representatives from wider society represented in the board 	<ul style="list-style-type: none"> Monitoring of trends by TA staff Involvement of board, with mainly representatives from science 	<ul style="list-style-type: none"> Expert participation 	<ul style="list-style-type: none"> Representatives from science in majority in project advising committee
Society			<ul style="list-style-type: none"> One science journalist in 2012 external Evaluation Committee 	<ul style="list-style-type: none"> Support from separate communication department 	<ul style="list-style-type: none"> Strong support from communication staffers Science journalists may be contracted for support 	<ul style="list-style-type: none"> Stakeholder participation Citizen participation Public events 	<ul style="list-style-type: none"> To some extent, stakeholders are represented in project advising committee 	

NORWAY		Clientele	Funding	Evaluation Committee or Group	Board, Panel or Platform	Working program	Staff	Project team	Project participants	Project Advising and/or Reviewing Group
NBT Parliament	<ul style="list-style-type: none"> The Norwegian Parliament is a key recipient of assessments and advice from the NBT 	<ul style="list-style-type: none"> Final approving of annual, national budget, herein the NBT budget 	<ul style="list-style-type: none"> Politicians were interviewed in the evaluation procedure 	<ul style="list-style-type: none"> Active MPs excluded from the Board 	<ul style="list-style-type: none"> Ongoing parliamentary debates and topics "rising" on the political agenda are important when assessing project ideas 	<ul style="list-style-type: none"> Secretariat employed for carrying out Technology Assessment. Staff members with background from science, business, and ministries 	<ul style="list-style-type: none"> Not part of project team, but indirect influence on projects through parliamentary debates, committees in meeting etc. 	<ul style="list-style-type: none"> MPs involved at seminars, and through separate meetings with MPEs and standing committees in Parliament 	<ul style="list-style-type: none"> The expert groups contribute to assessments and serves as advisors to the projects. 	
	<ul style="list-style-type: none"> The Government is a key recipient of assessments and advice from the NBT 	<ul style="list-style-type: none"> Annual budget through the Ministry of Trade and commerce 	<ul style="list-style-type: none"> In 2010 the government appointed a research group to evaluate the NBT ("one-of-a-kind -a-kind evaluation") A Steering Committee, with also members from the Ministry of Trade and Commerce represented, lead the evaluation 	<ul style="list-style-type: none"> Board appointed by the government, formally through the Ministry of trade and commerce 	<ul style="list-style-type: none"> NBT staff have informal talks with government representatives about possible topics 	<ul style="list-style-type: none"> Secretariat employed for carrying out Technology Assessment. Staff members with background from science, business, and ministries 	<ul style="list-style-type: none"> Not part of project team, but TA-staff interacts with members of government and employees of ministries. This may be input to on-going projects. Employees of governmental agencies may occasionally take part in expert groups 	<ul style="list-style-type: none"> At times, open hearings or scenario workshops are organized 	<ul style="list-style-type: none"> The expert groups play a central role in NBT projects. NBT staff strongly interacts with group members At times, open hearings or scenario workshops are organized 	
Science			<ul style="list-style-type: none"> A research group was appointed to evaluate the NBT in 2010 A Steering Committee, with also members from the Research Council represented, lead the evaluation Experts were interviewed 	<ul style="list-style-type: none"> Representatives from the scientific community represented in the board 	<ul style="list-style-type: none"> Monitoring of trends by TA staff Board heavily involved Experts are invited for brainstorm 	<ul style="list-style-type: none"> Secretariat employed for carrying out Technology Assessment. Staff members with background from science, business, and ministries 	<ul style="list-style-type: none"> Projects team from NBT staff, strongly supported by expert groups, who play a key role in most NBT projects. The groups have participants from academia/science, industry, NGOs 	<ul style="list-style-type: none"> Expert groups play a central role in NBT projects. NBT staff strongly interacts with group members At times, open hearings or scenario workshops are organized 	<ul style="list-style-type: none"> The expert groups contribute to assessments and serves as advisors to the projects. Additional feedback from the board, with several representatives from the science community 	
Society	<ul style="list-style-type: none"> Actively stimulate public debate Thereby raise public awareness Communicate results to the wider society 		<ul style="list-style-type: none"> Stakeholders were interviewed 	<ul style="list-style-type: none"> Representatives from business and wider society 	<ul style="list-style-type: none"> Stakeholders are invited for brainstorm Public call for input on the website 	<ul style="list-style-type: none"> Secretariat employed for carrying out Technology Assessment; staff members with background from science, business, and ministries 	<ul style="list-style-type: none"> TA-staff strongly interacts with expert group, wherein stakeholders are represented 	<ul style="list-style-type: none"> TA-staff strongly interacts with expert group, wherein stakeholders are represented At times, open hearings or scenario workshops are organized Citizen participation 	<ul style="list-style-type: none"> TA-staff strongly interacts with expert group, wherein stakeholders are represented Additional feedback from the board, with some representatives from wider society 	

SWITZER- LAND TA-SWISS Parliament	Clientele	Funding	Evaluation Committee or Group	Board, Panel or Platform	Working program	Staff	Project team	Project participants	Project Advising and/or Reviewing Group
	<ul style="list-style-type: none"> Studies, abridged versions and recommendations are directed to decision makers in politics (diffusion via personal contacts, conferences, Politiker-Apero or presentation in Committees) 	<ul style="list-style-type: none"> Parliament validate or amend the budget proposed by the Government (TA-SWISS budget is part of the budget for Education and Research) 	<ul style="list-style-type: none"> No formal evaluation request by Parliament Government proposes a budget, which is approved, amended or rejected by the Parliament every four years on the basis of a status report (what has been achieved and the description of the objectives/activities for the next 4 years) 	<ul style="list-style-type: none"> Active MPs are excluded A few former MPs are represented 	<ul style="list-style-type: none"> No formal role of Parliament Strong involvement of Steering Committee, where off-charge politicians may be represented MPs can give some inputs, e.g. during informal contacts 			<ul style="list-style-type: none"> In some projects, MPs may be interviewed or take part in workshops 	<ul style="list-style-type: none"> MPs can take part in project advising group (very rare)
	<ul style="list-style-type: none"> Studies, abridged versions and recommendations are directed to decision makers in politics (via personal contacts, conferences, Politiker-Apero etc.) 	<ul style="list-style-type: none"> Government is funding TA-SWISS (Federal Office for Education and Science) Other administration departments may financially contribute to projects related to their activities 	<ul style="list-style-type: none"> No formal evaluation request by Government Government proposes a budget every four years based, inter alia, on a status report (see above) 	<ul style="list-style-type: none"> No members of Government Members of administration departments as guests, i.e. with consultative voice 	<ul style="list-style-type: none"> No formal role of government Members of the government (ministries, administration departments) can give some inputs, e.g. as guests in the Steering Committee or during informal contacts 			<ul style="list-style-type: none"> When a public administration is co-funding a project: contribution to the project definition and communication In some projects, members of administration may be interviewed or take part in workshops 	<ul style="list-style-type: none"> Members of public administration can take part in project advising group

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Project Advising and/or Reviewing Group	<ul style="list-style-type: none"> Scientists from various fields take part in project advising group 	<ul style="list-style-type: none"> Project team Expert participation in workshops, interviews, etc. 	<ul style="list-style-type: none"> Most research is outsourced to researchers from universities or research bureaus Participatory projects are conducted internally, by project managers 	<ul style="list-style-type: none"> Stakeholder participation in workshops, interviews, etc. Citizens taking part in participatory methods 	<ul style="list-style-type: none"> Communication projects and events are conducted internally, by communication officer 	<ul style="list-style-type: none"> Various stakeholders take part in project advising group Representatives of media can take part in project advising group
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Board, Committee, Panel or Platform	<ul style="list-style-type: none"> Mainly scientists in Steering Committee 	<ul style="list-style-type: none"> Monitoring and proposal of themes, as well as of plans by TA-SWISS project managers (scientific background) Strong involvement of Steering Committee (with representatives from the scientific community) 	<ul style="list-style-type: none"> Project managers with scientific background 	<ul style="list-style-type: none"> Stakeholders are represented in the Steering Committee (representative of NGOs, trade unions and industry) Media representatives are sitting in the Steering Committee (journalists) 	<ul style="list-style-type: none"> Monitoring and proposal of themes, as well as of plans by TA non-scientific staff (e.g. communication officer) Strong involvement of Steering Committee, with representatives from NGOs, trade unions, industry and media 	<ul style="list-style-type: none"> Communication officer (journalist background)
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Clientele	<ul style="list-style-type: none"> Reports of interdisciplinary studies are directed to the scientific community, as they provide scientific assessment of technologies or analysis of technology-related problems (diffusion via scientific conferences, scientific journals, etc.) Some recommendations are directed to scientists 	<ul style="list-style-type: none"> Governmental budget earmarked at the Academy Optional additional funding from public research institutions Some European research funding 	<ul style="list-style-type: none"> Related to its quality control task, the Steering Committee (with scientists being represented) may commission an evaluation of the institution (until now, every 8-10 years) 	<ul style="list-style-type: none"> Related to its quality control task, the Steering Committee (with stakeholders and journalists being represented) may commission an evaluation of the institution (until now, every 8-10 years) 		
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SWITZERLAND (cont.) TA-SWISS Science	Society
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USA	Parliament GAO	<ul style="list-style-type: none"> Provide products to both houses of Congress to support congressional oversight, insight, and foresight responsibilities TA requests may come from committees or subcommittees from either house of Congress 	<ul style="list-style-type: none"> Annual budget as determined by Congress 	<ul style="list-style-type: none"> Congressional authorizers and appropriators provide direct oversight GAO produces an annual performance and accountability report for the entire institution GAO-wide reviews performed internally 	<ul style="list-style-type: none"> Congressional authorizers and appropriators provide some guidance, as do other committees TA product line falls under purview of Comptroller General's Advisory Board 	<ul style="list-style-type: none"> Work performed upon a request or mandate from Congress Work may be conducted on GAO authority as an independent congressional oversight agency 	<ul style="list-style-type: none"> Work is requested or mandated by congressional staff, but independence requirements for all GAO work mean only GAO staff are allowed to work directly on reports 	<ul style="list-style-type: none"> GAO staff and management have expertise in government programs and operations Project team is internal to GAO and includes personnel with expertise in science/engineering Additional GAO staff provide social science and communications support 	<ul style="list-style-type: none"> Expert participants often include knowledgeable government officials 	<ul style="list-style-type: none"> Relevant federal agencies may review draft reports. Their reviews are typically included as an appendix to the report 	<ul style="list-style-type: none"> U.S. National Academies and other selected experts review draft reports for technical accuracy
Government		<ul style="list-style-type: none"> GAO products may include matters for Congressional consideration and/or recommendations for government actions 		<ul style="list-style-type: none"> Formal peer-review of GAO reports conducted by an international group of supreme audit institutions 			<ul style="list-style-type: none"> GAO staff has expertise in government programs and operations 	<ul style="list-style-type: none"> GAO staff and management have expertise in government programs and operations 	<ul style="list-style-type: none"> Expert participants often include knowledgeable government officials 	<ul style="list-style-type: none"> Relevant federal agencies may review draft reports. Their reviews are typically included as an appendix to the report 	<ul style="list-style-type: none"> U.S. National Academies and other selected experts review draft reports for technical accuracy
Science		<ul style="list-style-type: none"> Non-profit/academic science and technology policy community 		<ul style="list-style-type: none"> GAO Technology Assessments generally require external engagement/review with U.S. National Academies 			<ul style="list-style-type: none"> GAO personnel conducting TA work have expertise in the natural sciences and engineering 	<ul style="list-style-type: none"> Project team is internal to GAO and includes personnel with expertise in science/engineering 	<ul style="list-style-type: none"> Expert participants often include scientists in academia, industry, or government 	<ul style="list-style-type: none"> U.S. National Academies and other selected experts review draft reports for technical accuracy 	<ul style="list-style-type: none"> U.S. National Academies and other selected experts review draft reports for technical accuracy
Society		<ul style="list-style-type: none"> GAO products are typically made publically available at www.gao.gov 					<ul style="list-style-type: none"> GAO personnel supporting TAs have expertise in social sciences (e.g., survey methodology) and communications 	<ul style="list-style-type: none"> Additional GAO staff provide social science and communications support 	<ul style="list-style-type: none"> Stakeholder participants can be from non-governmental organizations, nonprofit groups, or through the use of surveys, the general public 	<ul style="list-style-type: none"> U.S. National Academies and other selected experts review draft reports for technical accuracy 	<ul style="list-style-type: none"> U.S. National Academies and other selected experts review draft reports for technical accuracy