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The TA Manifesto

Abstract: *A common statement from the organizations involved in the PACITA project, the PACITA manifesto argues for the necessity of European political support of future efforts to expand technology assessment (TA) capacities in the European member states. The authors posit the tradition of technology assessment in European as a democratic project to inform policy makers on societal and environmental topics related to science, technology and innovation. And they call attention to the necessity of countering the increasing influence of science and technology on societal development and policy making with increasing capacities for technology assessment. Developing a more comprehensive 'policy-oriented' approach to TA is called for by the authors along with an increase in cross-European collaboration in TA.*

Klüver, Lars, Rasmus Øjvind Nielsen, and Marie Louise Jørgensen, eds. *Policy-Oriented Technology Assessment Across Europe: Expanding Capacities*. Basingstoke: Palgrave Macmillan, 2016. DOI: 10.1057/9781137561725.0008.

Expanding knowledge-based policy making on science, technology and innovation

Technology is a central element in the policy response to the great challenges of our time, such as ageing societies, climate change and public health. In addition, emerging technologies such as synthetic biology, nanotechnology and the ever-changing Internet all challenge established policies. The encompassing quality of technology today is influencing the lives of citizens all over the world. The global transforming power of technology, thus, has to be aligned with policy making and democracy.

Technology assessment (TA) can be seen as a democratic project in Europe, providing and supporting robust and knowledge-based policy making on societal topics related to science, technology and innovation. It has mostly been established in the western parts of Europe and in connection to national parliaments.

Technology development and policies are becoming transnational. At the same time, the need for multilevel action on the grand challenges of our societies is obvious. Modern policy making needs to bridge these transnational and multilevel dimensions of the development, regulation, implementation and management of technology. The rapid technological development, in combination with science and technology's profound influence on societal developments and policy making, call for an important and increasing role for European TA in the future.

The PACITA project has during 2011–15 enhanced European TA by:

- ▶ enhancing the capacity for doing TA in and across European nations;
- ▶ increasing cross-European collaboration in TA;
- ▶ expanding the institutionalization of TA across Europe;
- ▶ developing the conceptual framework of TA into a more comprehensive 'policy-oriented approach', adding to the traditional parliamentary-oriented TA in Europe;
- ▶ raising awareness about the possibilities for modern policymaking that lies in TA.

TA – a multi-level and cross-border European capacity for the future

The PACITA project should be seen as a new setoff for a necessary expansion of the European TA landscape:

TA should collaborate to increase the capacity of providing robust and independent policy advice for policy makers in all of Europe. As the EU grows and Europe becomes more connected, TA can through strong knowledge sharing and collaboration contribute to knowledge exchange and synergies, which provide for widespread use of the independent and knowledge-based advice from TA. Countries should help each other by sharing TA knowledge and outcomes.

TA should be institutionalized in all European countries in order to provide for independent knowledge-based advice and to promote the engagement of stakeholders, experts, citizens and policy makers in a collaborative, democratic provision of policy options. The diversity in cultures and political contexts in Europe call for national implementation of TA in ways which are optimal for the single nation. For Europe to develop strong knowledge-based and democratic decision making, TA needs to be implemented in all European states.

There is a clear political call for increased parliamentary dialogue across Europe on the technological development and its meaning for our societies. TA should play an active role in setting up that dialogue. In a context of globalization and European construction, policy making on many science- and technology-related issues needs a cross-border approach. As stated by two parliamentary meetings in PACITA, TA has an important role to play in setting up parliamentary dialogue across Europe.

Citizens in Europe have a democratic right to be heard about the technological development since technology is strongly influencing their lives. PACITA has proven that TA has the methodology to make that right happen on the European level. Over the years, TA has developed a toolbox of methods and approaches for engaging different groups of actors, and especially the involvement of citizens in policy debates. Seeing that the 'grand challenges' will demand an understanding of scientific and technological analysis as well as of societal values, TA is well suited to giving advice on these topics, also based upon citizen engagement.

Strong TA collaboration on the project level across Europe should be encouraged and supported. The development of technology moves forward with increasing pace. Because these developments happen on a European and international level, the need for cross-European TA is evident. Collaboration between countries and institutions will ensure that knowledge from experienced TA units is combined with new thoughts and ideas from emerging TA actors.

TA has a crucial role to play in the European strive for ensuring socially responsible research and innovation. Responsible Research and Innovation (RRI) has shaped the recent years' policy discourse in Europe related to the societal role of research and innovation. It has given greater focus to key concepts in TA, such as participation, forward-thinking, reflexivity and policy action. TA can and should be a key carrier of the concept and should play a light-house role in RRI.



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Part I

Expanding Technology Assessment



OPEN

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Seeing Technology Assessment with New Eyes

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and André Krom*

► **Abstract:** *Van Est et al. present a ‘relational’ model for analysing technology assessment (TA) institutions. Expanding on metaphor of TA as a bridge between science, society and policy, the authors describe how such bridges are established in terms of network relations. European TA institutions in various ways link parliaments and governments with civil society and science. In part, TA projects provide such linkages, but importantly, TA institutions in themselves also provide informal personal links between societal spheres. With in-depth examples from different European member states, Van Est et al. provide institutional entrepreneurs with rich material for imagining institutional TA arrangements that might fit within their own national arenas.*

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Creating institutional platforms for technology assessment (TA) has proved possible via different nationally specific pathways. In examining these pathways, previous reflections on the institutionalization of TA have focused on the relationships between TA institutions and national parliaments. However, movements both internal and external to TA mean that relations to other societal spheres have gained increasing importance for many TA institutions. In order to provide insight into the full range of possible institutional arrangements for delivering policy-oriented TA services, we provide a model for the network relations that help to create and sustain TA institutions. We then draw out implications for the design of S&T governance.

A relational framework allows for a better understanding of technology assessment and its role within the complex of institutional relations underpinning the governance of science and technology (S&T) in society. Understanding TA in relational terms implies taking full account of the position that TA occupies in a social network (e.g. a governance network) and acknowledging that various bonds enable and constrain the activities of organizations performing ‘TA-like’ functions. We apply this model to existing TA institutions and develop a typology of ways that TA may evidently fit within national institutional contexts. Our motivation is to help institutional entrepreneurs and political supporters of emerging TA platforms to imagine arrangements that will fit their specific national arenas. We seek to provide evidence of the relations between TA, other public institutions, and other societal sectors in order to guide strategic processes of network-building around the promotion of national TA capacities. Moreover, we argue that TA can and should be seen as a necessary part of democratic S&T governance.

The model expands upon a long-standing metaphor for TA as a provider of ‘bridges between science, society and policy’ (Decker and Ladikas, 2004). The model concretely maps the relationships between existing parliamentary technology assessment (PTA) institutions and four societal ‘spheres’ involved in S&T governance, namely parliaments, governments, S&T, and (civil) society. The mapping takes into account a range of mechanisms of interaction between these spheres, distributed on a macro (institutional), meso (organizational) and micro (project) levels. The model thereby illustrates how (P)TA functions in terms of information exchange and relational trust-building between different societal actors.

Comparing the results of our case studies, it is clear that ‘parliamentary TA’ is much broader than the label suggests. While parliament

remains an essential base for most existing policy-oriented TA organizations, building and maintaining credibility towards actors within government, S&T, and society in the broad sense is important for operating effectively and with legitimacy – even for TA offices nested inside parliaments. Five different organizational variants of TA are currently operational where different weight is given to each of these societal spheres. There are thus many strategies to pursue in countries that want to establish TA-like support functions, and the material provided here will help to make the best of the opportunity structures that exist in each individual country.

Lessons learned, relevant to promoters of TA-like arrangements, include:

- ▶ Acknowledge the dependence of TA in order to achieve independent advice with an impact
- ▶ Consider the whole institutional possibility space when setting up new TA organizations
- ▶ Foster relationships on the institutional, organizational, and project levels

Background

Throughout its history, three concerns have been of fundamental importance to the practice of PTA, namely:

- ▶ how to institutionalize PTA
- ▶ how to structure PTA organizations
- ▶ how to design and perform PTA projects

For example, the establishment of the Office of Technology Assessment (OTA) in 1972 in the United States presented a real institutional innovation. OTA was meant to provide Congress with ‘unbiased’ information concerning, for example, the social and political effects of technologies. The establishment of a congressional TA bureau was a way to redress the imbalance between legislature and executive with regard to technological change, and thus it was an attempt to strengthen the representative model of democracy (Van Est and Brom, 2012). When during the 1980s several European countries created PTA institutions, the focus was also quite naturally on institutionalizing and organizing PTA. A key issue in

this debate was how the relationship between the Parliament and the TA organization should be shaped to make it fit comfortably in the specific political cultures of each country.

In some countries, such as Denmark and the Netherlands, controversies over technologies were seen not only as a matter of power balance between the government and each parliament but also as a problem between the government, the parliament, and the wider public (Van Eijndhoven, 1997). As a result, in these countries public education and debate were seen as central to the mission of PTA, which led to early experiments in 'participatory' TA. In the 1990s, growing uncertainty and societal disagreements concerning pathways for technological innovation and economic development led to increased political interest in the use of participatory methods to achieve legitimacy of hard political choices that were made in situations where science could provide only soft evidence, and these choices would need legitimacy through public deliberation and consent (Funtowicz and Ravetz, 1992). During this period, debates in the PTA community (facilitated for instance by the EUROPTA project) sought to consolidate practical experiences with public engagement and to arrive at mutual understandings of how to design and perform participatory TA projects (Joss and Belluci, 2002) – for instance, the role of project management, the choice of methods (Van Eijndhoven and Van Est, 2002), and the impact of participatory TA (Hennen, 2002).

At the turn of the millennium, however, the initial wave of 'participation optimism' at the political level was countered by demands for evaluative evidence of the positive effects of linking citizens' participation and stakeholder dialogues to processes of policy formation based on expert input. To maintain its political legitimacy and mandate, the PTA community thus became concerned with the visibility and impact of its own activities. In the TAMI project (Decker and Ladikas, 2004), this led to a wider reflection on the types of impacts that TA processes could have on different clients in different situations and how the institutional context of a PTA organization served to both enable and constrain the impact that TA could have on various publics (Cruz Castro and Sanz-Menéndez, 2005). Reflections on the practicalities of achieving impact in a world of distributed network communication led the TA community to focus on multiplatform communication (policy briefs, personal networking, websites, blogs, and media appearances).

The compounded output of these debates can all be traced in the so-called process definition of TA, which became standard after the TAMI project:

Technology assessment 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. (Bütschi et al., 2004: 14)

Today, we see a need to articulate the relevance of approaches to policy support developed within TA in a new and broader context of grand societal challenges. Here there may be a need for ‘non-PTA’ actors to take up and carry on the same practices. To this end, the openness of the definition of TA inherited from the TAMI project allows us today to apply the definition to a much broader field of organizations that work to provide similar forms of support to decision makers involved in S&T governance. The framework presented here can be used to clarify the institutional roles that various forms of TA or TA-like organizations can play within the governance of S&T.

The framework: TA understood in informational and relational terms

TA can be described in both informational and relational terms. On the one hand, the informational view characterizes TA practices based on the particular knowledge that they generate, namely knowledge about the societal aspects of S&T. The relational approach, on the other hand, starts with the insight that the TA field owes its continuing existence and position to support from its clientele. Our framework combines the two approaches based on the understanding that the informational and relational aspects go hand in hand. In support of this framework and adding to existing knowledge on TA, we try in the following first of all to come to grips with the relational aspects of TA.

Modelling TA in relational terms

Understanding TA in relational terms implies taking full account of the position that TA occupies in a social network (e.g. a governance network at regional, national, or European level) and acknowledging that various bonds enable and constrain the activities of organizations performing ‘TA-like’ functions. To create an evidence base for analysing

these relational factors, we scrutinized the interaction between existing PTA organizations and various social actors (Van Est and Ganzevles, 2012, Ganzevles et al., 2014, PACITA, 2014). The following four societal ‘spheres’ were defined to group actors in the institutional landscape around PTA organizations: parliament, government, civil society, and S&T. The choice of these four spheres was dictated by the most common characteristics of European PTA. For PTA organizations, their institutional linkage with parliament is of primary importance. Government, however, may also play a crucial role – for example, as a sponsor but also a recipient of advice. In addition, relationships with civil society (in the case of public participatory TA) may play an important role in the practice of PTA. And since PTA is ultimately about governing S&T, the model could not have done without the inclusion of S&T as a societal sphere. Of course, these choices do not imply in any way that other spheres such as media, industry and business are not relevant in many ways to TA in general.

To map existing models in terms of their relations with the four selected societal spheres, PTA organizations were asked to express the involvement of each of the four social in percentages. The results show that PTA organizations indeed establish and maintain multiple relationships with the four discerned social spheres. PTA organizations differ from each other to the extent that they interact (on the institutional, organizational, and project levels) with the four distinct social spheres. Out of the fifteen theoretically conceivable interaction models, the mapping process in the PACITA project identified five distinct PTA models that are currently operational in Europe.

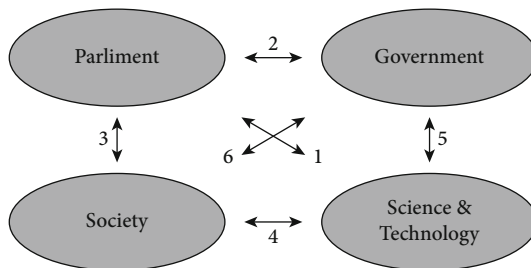


FIGURE 1.1 Four spheres involved in the relation model of PTA

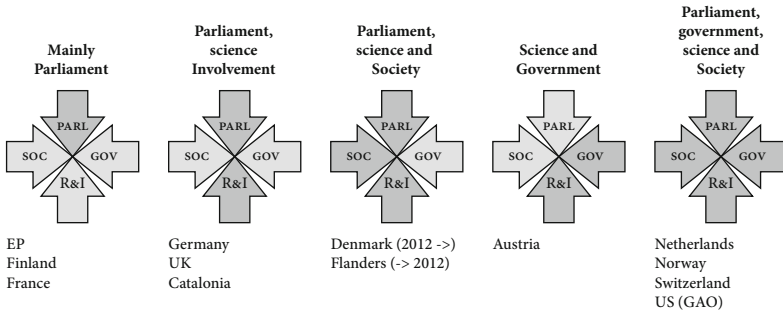


FIGURE 1.2 *Currently operational models of (P)TA*

We studied the linkages between TA and the four distinguished social spheres on three (interconnected) levels: institutional, organizational, and project. The macro-level or institutional-level concerns the political support for a TA organization that has the parliament as one of its main (formal) clients. It also concerns the way in which TA is legitimized and framed as an institutional solution for the governance of, often societally controversial, developments in research and innovation. The meso-level, or organizational level, concerns the politics of shaping and controlling the TA organization that has the task to perform PTA. Finally, the micro-level, or project level, relates to doing TA. Issues at this level are as follows: choices about the framing of the topic, choices between kinds of method, and strategies for establishing communication between the project and parliament or other recipients.. Our modelling of TA in relational terms is founded on the notion of informational interaction mechanisms, loosely defined as communicative procedures or routines on the institutional, organizational, and project levels for enabling and constraining the involvement of actors from the above-mentioned four social spheres in shaping the practice of TA. We discern nine interaction mechanisms: client, funding, evaluation committee, board, working program, project staff, project team, project participatory methods, and project revising and/or reviewing. While the first five interaction mechanisms play out on the institutional and/or organizational levels, the latter four all play out on the project level.

In the following pages, this framework is applied to three different cases, illustrating how the relational conceptualizing of TA(-like) activities may help to analyse the process of institutional pathfinding and adjustment, as well as institutional issues that underlie concrete TA projects.

Case 1: pathfinding in Bulgaria

The relational model of TA can also be used to make emerging developments explicit, pointing to still-fragile structures, providing a snapshot of where a country is on a potential evolutionary pathway for TA. We use the case of Bulgaria to illustrate this.¹

The TA-landscape

Bulgaria is in a highly explorative phase when it comes to dealing with the societal issues of S&T. The PACITA-partner, ARC-FUND, is a central player in this field. Its task is to ‘shape policies and developments towards information society and knowledge economy in a national, regional, European and global context’. The national Academy of Sciences is another important actor. In Bulgaria, expert advice (like TA) to policy makers is a delicate matter. Besides a high level of public distrust in the political system, recent years also show an erosion of trust in scientific institutions. This creates a vicious circle in which policymakers rarely ask for expert advice and policy making is perceived as lacking a sufficient knowledge base.

In 2012 a temporary parliamentary committee on shale gas was set up to carry out activities, which – from a TA point of view – resemble a PTA project. The committee had some months to study and discuss good practices and legislative options for the environmentally safe exploration and mining of shale gas. Three hearings with external experts were held. MPs in the committee mainly listened; some complained; and others seemed to feel offended by the views of the experts. Both actors from the realm of S&T and representatives of NGOs were invited. These activities could have been a good starting point for setting up more of these PTA-like activities since a good example tends to be followed. The committee, however, has been subject to strong criticism: its objectivity and impartiality were doubted. It seems that objective, multidisciplinary analysis, interpretation, integration, and review of the knowledge gathered in the hearings were lacking. Developing TA-like skills and capacity might help make such TA-like activities trustworthy from both a political and a societal point of view.

A government – society – S&T network forum

The PACITA project enabled ARC-FUND to search for organizational and institutional TA-capacity. For several reasons, ARC-FUND considers

the governmental branch a more favourable client and sponsor of TA than it considers parliament: to a large extent, the government branch governs the political decision-making process; preoccupied by the next election, politicians have little interest in 'long-term', complex S&T issues; the government has adopted a new national innovation strategy, to which the early 'horizon scanning' of societal issues, related to S&T developments, can contribute.

ARC-FUND's institutional strategy is to act as a network secretariat ('staff' in our modelling) for TA-like activities in Bulgaria. The formation of a cross-disciplinary TA network is aimed for, in which representatives of expert-based organizations, think tanks, and policy institutions are represented (board, committee, panel, or platform in our TA model). ARC-FUND aims to increase both awareness about TA as well as the level of societal debate (relevant for the 'client' category in our modelling). A TA network forum is foreseen, gathering annually for a public debate on the most pressing S&T related issues (cf. 'working program' in our model). There is no guarantee that this will lead to a formal institutionalization of TA. But various actors have addressed the need for a pilot project in order to 'prove' the relevance of TA for Bulgaria – preferably within the relevant organizational and institutional structures.

Case 2: Institutional re-adjustment in Austria

The relational modelling of PTA institutions enables us to map dynamic developments of existing organizations as relations change over time. Political dynamics may result in the shifting importance of the four societal spheres, to which the organization relates itself. One current case of such 'drifts in the possibility space' is Austria. Since the ITA is deeply rooted in the academic world and has a high proportion of studies carried out for government, the Austrian situation can be described as 'shared science-government involvement in TA'. Lately, however, we observe a slow move towards 'shared parliament-government-science-society involvement in TA' in that both the national and European parliaments are becoming more important as clients for the ITA just as the citizens become active participants in projects and target groups for increasing public-relations activities.

Strengthening connections with society and parliament

First, Austria's core TA organization, the Institute of Technology Assessment (ITA), has expanded its portfolio considerably towards greater involvement of society. On the one hand, participatory procedures are gaining importance in the ITA's work programme and are at the centre of many ITA projects. While a few years ago the ITA mainly observed the developing participatory TA approaches, contributed to theoretical projects such as EUROPTA, or assessed participatory events carried out by others, the ITA is now involving citizens and stakeholders on a regular basis. On the other hand, its mother institution, the Austrian Academy of Sciences – as well as the Federal Ministry of Science, Research and Economy – push the ITA towards an intensified relationship with society. As a consequence, a professional public-relations unit has been set up inside the institute, not only feeding the new Internet-based social media but also playing an growing role in the ITA's public events and project dissemination activities.

Second, while there has been only limited contact between the ITA and the Austrian Parliament ('Nationalrat') for almost two decades, the situation has been changing since 2012. The Nationalrat has shown increased interest in TA. In particular, its Research, Technology and Innovation (RTI) Committee has invited the ITA on several occasions to present TA work and to explain what it could contribute to parliamentary work. The acknowledgement of technology assessment as a potentially valuable contribution culminated in 2013 with a full membership of EPTA. Since then, the ITA is in regular exchange with parliamentarians, offering amongst other things a newly devised policy-briefs series explicitly targeted towards MPs. These so-called ITA-Dossiers are two-pagers that present TA topics in plain language and with a focus on possible political action. Most recently, in mid 2014, the Nationalrat decided to solicit a study on how to best implement advice and input with regard to TA and foresight for the Austrian Parliament. This one-year study will produce concrete proposals for the future relationship between the Nationalrat and, in particular, the ITA. A pilot project on 'Industry 4.0' is also under way in 2015, with a view to include these experiences in the recommendations. For these projects, the ITA is partnering with an institute that specializes in foresight and technology policy, so the Austrian Parliament can be said to be knitting closer ties with the TA and foresight communities. Two further developments support this growing

importance of the parliamentary level: first, the mother institution of the ITA, namely the Austrian Academy of Sciences, has started offering its competencies to the Nationalrat; presentations and debates of recent societally relevant research done in the Academy are planned as regular events in the premises of the Parliament. Second, the ITA became a member of the European TA Group (ETAG), carrying out projects for the Science and Technology Options Assessment (STOA) panel of the European Parliament. So far, four such projects were concluded.

Case 3: Placing a TA project in a cross-national context

The relational model can usefully be applied to concrete TA projects. The PACITA sub-project ‘Future Panel on Public Health Genomics’ had a transnational approach and involved a consortium of organizations from both PTA and non-PTA countries. It made use of the Future Panel method, in which, from the very start, a panel of MPs (the Future Panel) co-determines the research agenda, together with a broad range of experts and guided by TA specialists. In the PACITA experiment, the Future Panel method was used in a cross-European context. In this sense, the project was truly a methodological experiment (see Chapter 6).

Analysing this project at the micro (project) level, the meso (organizational) level, and the macro (institutional) level enables us to highlight some essential connections between these three levels and formulate some lessons for the future use of TA methods in a cross-national context. We learn that there is *therefore* a need for more knowledge about how the relational basis is established for TA in networks of organizations and on the transnational level.

At the project level, an important aim of the sub-project was to support evidence-based policy making on Public Health Genomics (PHG). However, it turned out to be difficult to connect the evidence base provided on a range of issues related to PHG to the European political and policy debate in a constructive way. The Future Panel consisted of MPs from different national parliaments, who had to discuss policy issues and options concerning PHG on a *European* level. Accordingly, the research and policy agenda that evolved in the PACITA project did not always match the political issues and the context, which members of the Future Panel, and members of the task team had to face on the national level. This gap between the national and European political agenda also

limited the opportunities for dissemination of the project results, at both the European level and the national level.

At the organizational level, the close cooperation between established (P)TA institutions and organizations in countries without such institutions presented some practical challenges. These challenges, however, were taken into account to stimulate mutual learning and are discussed in Chapter 6. The cross-national dimension of these challenges, however, needs special attention. Within the PACITA project, the relational TA perspective was applied to clarify the interactions between *one* particular organization and the various identified social spheres: parliament, government, society, and S&T. But the team responsible for the Future Panel on PHG was not drawn from one organization with a clear position in the ‘possibility space’ of TA at the European level. In fact, the team was deliberately composed of members who represent organizations with *different* positions in that possibility space. There is a clear lack of knowledge about how TA projects are set up in cross-national networks of organizations.

At the institutional level, the institutional conditions for effectively connecting the project results to policy making were not in place. Future Panel members were invited as individual MPs, with no formal appointment by their respective parliaments. As a result, the connection between the project results and the respective parliaments was not very robust. And although funding was in place, it was not clear who the client actually was. We think that this is also true for many other FP7-funded projects. Many European Commission–instigated experiments revolve around the possibility of cross-European TA-like activities (Barland et al., 2012). One might argue that the EC is the client since it funds the projects and since EC-funded projects typically involve reporting in the form of sending deliverables with the project results to the EC. Our way of looking at TA presents a more involved type of client, either on the project, organizational, or institutional level. This raises the question of whether the proper institutional conditions are in place to truly connect the outcomes of EC-funded cross-European TA-like activities to policy making.

Lessons learned: Implications for the democratic governance of S&T

Defining TA in relational terms opens up a new way of understanding TA and leads to a new way of questioning TA and both its role and impact

in the way that modern society deals with S&T. This section explores what implications our new approach has for the future of TA and, more generally, for the democratic governance of S&T. We believe that this set of lessons is relevant not only to the TA community but also to all kinds of TA-like activities, one important instance being the responsible research and innovation (RRI) activities that will be developed in the context of Horizon 2020.

The lessons learned are structured by the three key elements of our model: (1) connecting to four societal spheres; (2) making connections on the micro-, meso-, and macro-levels; and (3) making connection by means of interaction mechanisms. Our reflections have led to nine lessons.

TABLE 1.1 *Key elements of the relational model of TA and related research issues and lessons learned*

Key elements of the relational model of TA and related research issues	Lessons learned
<i>Connecting to four social spheres</i>	
• Characterizing TA	Lesson 1: Understanding TA in informational and relational terms is useful Lesson 2: TA can effectively play out in many institutional and organizational forms
• Bridging PTA- and non-PTA-countries, and PTA and TA countries	Lesson 3: Intellectual playing field needed between PTA, non-PTA and TA Lesson 4: When setting up new TA organizations consider the whole institutional possibility space
• TA and the governance of S&T	Lesson 5: Acknowledge the institutional and organizational constraints that the governance of S&T may face
• Long-term institutional dynamics and adaptability	Lesson 6: Existing TA organizations need to adapt to changing demands
<i>Making connections on the micro-, meso- and macro-levels</i>	
• Making connections on three levels	Lesson 7: Foster relationships on the institutional, organizational, and project levels
• Organizational and institutional conditions for successful TA project	Lesson 8: Improve organizational and institutional conditions for the success of TA-like activities
<i>Understanding interaction mechanisms</i>	Lesson 9: Acknowledge the dependence of TA organizations, in order to achieve independent advice with an impact

Connecting to four spheres

Characterizing PTA

Research within the PACITA project shows that PTA organizations indeed establish and maintain multiple relationships with the four discerned social spheres. PTA organizations differ from each other to the extent that they interact (on the institutional, organizational, and project levels) with the four distinct social spheres. As we saw earlier, the mapping process in the PACITA project identified five distinct TA models that are currently operational in practice in the field of PTA. The PACITA research thus confirms that it makes sense – both conceptually as well as practically – to talk about PTA in terms of its relationship to four spheres – parliament, government, society, and S&T. Moreover, PTA can and does play out in many different forms, and these forms can all be effective in their own manner. Consequently, the following two lessons can be drawn:

Lesson 1: Understanding TA in informational and relational terms

From both a conceptual and a practical point of view, it is important to understand TA both in informational terms (as a form of science-based policy advice) and in relational terms. According to the relational view, it is essential to consider the relationships of knowledge sharing and trust that TA organizations build up and maintain with different societal spheres, such as parliament, government, society, and S&T.

Lesson 2: TA can effectively play out in many institutional and organizational forms

Each of the models identified in the study can be effective in a specific context.

Bridging PTA and non-PTA countries, and PTA and TA countries

Our model has been developed to characterize TA institutes. As a result, the model can be used to typify TA organizations that either do or do not have a parliament as one of their clients. This is illustrated by the Austrian TA organization ITA, which was characterized as ‘shared government-science involvement in TA’. Our model thus creates an intellectual level playing field between PTA and TA organizations, and also between PTA

and non-PTA countries, and even TA and non-TA countries. Creating such an intellectual level playing field has been a major drive behind the PACITA project because it is a necessary condition for mutual learning between PTA and non-PTA countries, which was the key objective of PACITA. Our inclusive model acknowledges the similarities between the various types of TA – ranging from parliamentary towards constructive TA and even non-institutionalized forms of TA – and enables us to study the similarities and differences between the various TA organizations and their activities. Based on this argument, we draw two further lessons:

Lesson 3: Intellectual level playing field is needed between PTA, non-PTA, and TA

The relational conception of TA creates an intellectual level playing field between PTA and non-PTA countries, between PTA and TA organizations, and treats various types of TA-like activities on an equal footing. This is a necessary condition for stimulating a mutual learning process between different countries, organizations, and TA-like activities. This perspective is also needed to show the added value of TA within the broader network of S&T governance activities.

Lesson 4: When setting up new TA organizations, consider the whole institutional possibility space

Since TA can play out in many different forms and since each can be effective in a specific context (see lesson 2), countries with an interest in setting up TA are encouraged to consider the whole ‘possibility space’ in order to select the model that is particularly suited to their political and societal demands and their institutional contexts.

TA and the governance of S&T

TA plays a role in the broader challenge of the democratic governance of S&T. Since our model treats various types of TA institutes and various types of TA-like activities on an equal footing, it opens up possibilities to study to what extent various TA institutes within a national or international setting can complement each other. In order to understand the complexities of the governance of S&T, there is a strong need to reflect on the interaction between the various research and engagement processes in the various social spheres and to reflect on the organizational and institutional constraints that these processes encounter. Such a

comprehensive approach is especially needed to get to grips with the particular added value of TA within the broader national network of S&T governance activities.

Lesson 5: Acknowledge the organizational and institutional constraints that the governance of S&T may face

In order to understand the complexities of the governance of S&T, we need to reflect on the interaction between the various research and engagement processes in the various social spheres and to reflect on the organizational and institutional constraints that these processes encounter.

Long-term institutional dynamics and adaptability

Appreciating the dynamics of TA on the institutional level is crucial for the future of TA, with regard to creating new institutions and maintaining existing institutions or adapting them to new political demands. Our model makes it possible to study the institutional development of a TA organization over a long period of time. The PACITA project shows that we need to take into account a long-term perspective to get to grips with that process. For example, it was found that in many countries the political debate about setting up PTA took a long time, often more than a decade. Moreover, existing institutes may radically or gradually change their institutional position.

Lesson 6: TA institutes need to adapt to changing demands

Over a longer period of time, the political and societal demands for TA change. In order to survive, existing TA organizations have to adapt to these changing circumstances. The ‘space of possibility’ offers ample opportunities for such adaptation. For example, a country may first set up a TA organization and later on gradually develop its PTA capacity, by building up stronger relationships with parliament and include parliamentary TA types of activities.

Making connections on the micro-, meso-, and macro-levels

Our model stresses that the relationships between the TA organization and the various social spheres are developed and maintained on three levels, each of which has its specific features and dynamics. Up till now, most research efforts have been put towards understanding and mapping

the relationship between PTA and parliament on the institutional level. The country reports of the PACITA project (PACITA 2012) is one of the first attempts to get to grips with how the relationship between PTA and the parliamentary process is shaped on the project level. Although these, often personal, contacts on the practical level often have a major effect on the impact of PTA, these types of activities of a PTA institution are rarely mapped or reflected upon. And how contacts between PTA and parliament are shaped on the organizational level is well known for PTA organizations that work very close with parliament, but they are far less known for the PTA organizations that operate at a distance to parliament. In addition, even less is known about the way in which PTA organizations set up and maintain relationships with the other three social spheres: government, S&T, and society. Here another complexity pops up in that these spheres consist of networks of organizations. It would be valuable to have more knowledge about to what extent and in what way a TA organization organizes and maintains its connections with various clusters of organizations (e.g. different governmental institutions).

Lesson 7: Foster relationships on the institutional, organizational, and project levels

Relationships between TA organizations and the various social spheres are developed and maintained on the institutional, organizational, and project levels. So far, literature on PTA institutions has focused on the institutional relationship between PTA organizations and parliaments, and too little attention has been given to the relationships of such organizations with the other social spheres and how contacts are shaped on the organizational and project levels.

Organizational and institutional conditions for successful TA projects

The description of TA methods often focuses on the project level. Our model implies that the impact of a certain method will also depend on institutional and organizational conditions. This dependency has received little attention from both scholars and policy makers. Most methodological descriptions take for granted that a TA organization with the proper human capacity and skills exists to perform the method and that such an organization has the proper institutional mandate

to perform the method. This, however, is not the case, neither on the national nor on the international level.

An important question that will be addressed is: if a particular TA method developed at the national level is used on the European political level, then to what extent does the impact of that method depend on well-developed relationships between TA and the political system on an institutional and organizational level?

At the moment, the notion of responsible research and innovation (RRI) politically frames, enables, and constrains contemporary discourse on how to properly enact the democratic governance of innovation. In the context of Horizon 2020, many TA-like RRI activities will be sponsored and set up. Also, in this context, it is important to address not only methodological questions, but also questions about the organizational and institutional conditions needed to guarantee a proper impact of those activities.

Lesson 8: Improve the institutional and organizational conditions for success of TA-like activities

The policy impact of a certain TA method will depend not only on the quality of the method and the result but also on whether well-developed relationships exist between TA and the political and governmental sphere, both on the organizational level and on the institutional level. It is important to strive for such conditions in case of TA-like RRI activities that are sponsored in the context of Horizon 2020.

Understanding interaction mechanisms

Many TA organizations, in particular PTA institutions profile themselves as independent organizations. By taking a relational perspective, our model stresses that creating and maintaining bonds with clients and other relevant actors is crucial for being relevant and having an impact. By acknowledging the dependence of TA on the four social spheres, the way in which interactions between TA and the four social spheres are exactly shaped on the three levels that we distinguished becomes an important research issue. In other words, it is relevant to open up the black box of the interaction between TA and parliament, government, S&T, and society and to study the interaction mechanism used by TA organizations. So the crucial challenge for TA organizations therefore is to deliver independent, trustworthy forms of science-based policy advice and maintain good relationships with the various social spheres

at the same time. In this way, independent advice, good relationships, and impact on policy can all be achieved in the long run

Lesson 9: Acknowledge the dependence of TA, in order to achieve independent advice with an impact

The challenge for TA organizations is to deliver independent, trustworthy, science-based advice and at the same time establish good relationships with the various social spheres.

Note

- 1 See also PACITA Deliverable 4.3 ‘Expanding the TA-landscape’ and Chapter 2 of this book.



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OPEN

2

Expanding the TA Landscape – Lessons from Seven European Countries

Leonhard Hennen, Linda Nierling and Judit Mosoni-Fried



Abstract: *This chapter explores socio-political opportunities for and barriers to introducing TA as a support for science and technology (S&T) policy making in seven of the new European member states. Based on interviews with national S&T actors and document studies, the study shows that any attempt to promote and establish TA has to take account of the situations in the countries explored, which differ in many respects from the situation during the 1980–90s when a first wave of TA institutionalization took place at national parliaments in Europe. Elements of ‘civic epistemologies’ such as a lively public debate on S&T policies are missing in some of the countries explored, and S&T policy making is busy modernizing the R&D system in order to keep up with global competition.*

Klüver, Lars, Rasmus Øjvind Nielsen, and Marie Louise Jørgensen, eds. *Policy-Oriented Technology Assessment Across Europe: Expanding Capacities*. Basingstoke: Palgrave Macmillan, 2016. DOI: 10.1057/9781137561725.0011.

Technology assessment as a means of policy advice is widely established in many Western European countries, whereas in Southern Europe and especially in the new European member states in Central and Eastern Europe, TA structures are often inexistent altogether. The PACITA project, by organizing explorations of existing barriers and opportunities for setting up TA in seven European countries, succeeded in starting up debates about TA among relevant actors and revealed a set of boundary conditions for introducing TA in the national R&I policy-making systems.

The societal situation in the countries explored is different in crucial respects from that of Western Europe during the 1970–80s where (parliamentary) TA institutions were first set up. Thus, not only are elements like a lively public debate on S&T policies missing in some of the countries but also S&T policy makers are busy modernizing the R&I system in order to keep up with global competition.

Our explorations were organized in an ‘action research’-like manner – that is, at the same time gathering knowledge about national preconditions for TA while actively intervening by facilitating high-level TA debates or triggering initiatives among relevant national actors. The exploration activities revealed that despite existing barriers, there is a role to play for TA by adapting to and offering support with regard to the existing deficiencies and problems of S&T policy making. Concerns about problems of S&T policy making often result in an explicit demand for ‘knowledge-based policy making’ in the context of which the concept of TA is welcome as a means to underpin decisions with best available knowledge in an unbiased manner. TA can significantly contribute to ongoing activities of modernizing the R&I system by strategically planning the R&I landscape, evaluating R&I capacities, or supporting the identification of socially sound and robust country-specific innovation pathways. Exactly due to often poorly developed democratic and transparent decision-making structures, TA could find a role as an independent and unbiased player able to induce communication among relevant actors on ‘democratic’ structures in S&T policy.

To further promote TA, one viable pathway would be continued collaboration – for example, through starting TA projects together with experienced TA countries but also through a continuation of national activities started by the PACITA intervention, such as training practitioners, doing pilot project(s), identifying the specific goals of doing national TA and finding reliable partners in politics but also in other societal spheres (science, industry and civil society).

Background

Since the 1970s, ‘technology assessment (TA)’ has been introduced in many Western industrialized countries. Its scientific origins lie in systems analysis and forecasting, but its scope has developed much further – conceptually as well as methodologically (Grunwald, 2009). In those Western European countries that have institutional platforms for TA, the practice of TA is clearly oriented towards policy making, and parliaments are seen as the main client of TA. Motivated by a lack of reliable knowledge and scientific expertise, in many Western countries parliaments have built up dedicated expert units in order to have the capacity to control governments’ decisions in S&T policy making. The main impulse for TA in Europe came from the establishment in 1973 of the OTA at the US congress, which mainly carried out expert analysis. After a period of searching for viable European pathways, a range of organizations was founded within European member states from the 1980s and onwards. In contrast to the OTA, some of these organizations focused in part on the involvement of stakeholders and the wider public. (See also the introduction to this volume). Although TA by now is established in many European countries, in other parts of Europe, especially in Southern, Central and Eastern Europe, there are no institutional settings of TA, and also the concept of TA is not used or is even unknown.

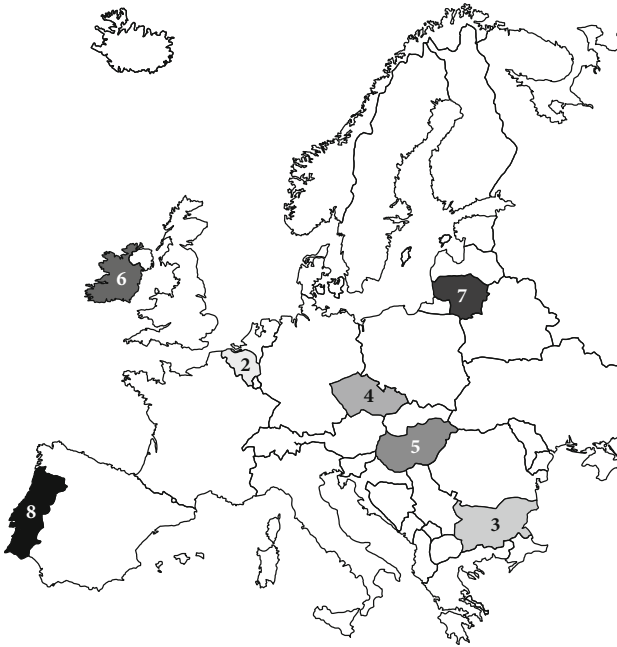
One aim of the PACITA project was to explore opportunity structures as well as barriers for TA in countries of Europe without TA infrastructures. To this end, an exploration was carried out in seven European countries (Belgium/Wallonia, Bulgaria, the Czech Republic, Hungary, Ireland, Lithuania and Portugal) to ascertain current needs as well as institutional preconditions for introducing TA in national processes of S&T policy making.¹ The countries explored have very different histories, and in each country debates on TA have very different starting points. In Central and Eastern Europe, TA is established neither in academia nor in policy making. Looking back on the history of Central and Eastern European countries, the differences in Western Europe are obvious. In the planned economy system, the ruling socialist (communist) parties had by far the most significant influence on policy making and in the R&D sector. At best, the Academies of Sciences have been involved in the decision-making process to a modest extent. This involvement was a common feature, although we cannot say that there was a uniform S&T system across these countries. Rather, there were divergent institutional

systems, especially from the 1980s when cooperation with Western countries became more regular than before enabling relatively open Central and Eastern European countries to introduce new measures – for example, a grant system in research, a dialogue within the scientific community on S&T policy questions and so on. After the transition, the R&D sector and also the Academies of Sciences started to decline due to downsizing of R&D funding and employment. That was followed by a phase of stabilization since the mid 1990s and then by recovery of the R&D sector by the end of the 1990s and early 2000s. As concerns structural changes in the R&D system, a gradual increase in the shares of universities and the business sector can be regarded as the most positive tendency in many Central and Eastern European countries. These stronger R&D actors seem to have a growing role in S&T policy making. However, civil society is only very slightly represented in S&T policy making. On the one hand, this lacking involvement is due to the traditionally peripheral role of the civil society in Eastern Europe, and on the other hand, it is due to the fact that in this region most citizens are more familiar with non-democratic (or ‘less democratic’) governance systems than with democratic ones.

In the Western European countries of the sample, there are already experiences with ‘TA-like activities’: In Portugal there has already been some debate on TA in the national parliament as well as in the academic community. While Ireland has a well-developed system of S&T policy advice and consultation, infrastructures explicitly dedicated to TA do not exist. In the Belgian region of Wallonia, there have been debates on parliamentary TA that have been ongoing for many years; however, no institutional setting of TA has resulted so far.

The national studies were conducted from February 2012 to March 2013, and they focused on national political and institutional contexts, existing capacities (actors, organizations and networks), demands and interests in TA-related activities and barriers and opportunities in national/regional contexts. Research methods comprised document analysis, interviews and discussion rounds with relevant actors and stakeholders. The explorations were done jointly by a twin team of researchers from respective national PACITA partners and from an experienced TA partner organization.

It is important to note that the explorations in the countries were conducted from the perspective of different organizations, ranging from Academies of Sciences (Czech Republic and Hungary) to research centres at universities (Ireland, Portugal and Wallonia) and to non-governmental



		Population 2011 Mio.	Year of EU entry	Democrat. system since	GDP p.C. 2011 Euro	GERD/ GDP % 2010	Private R&D % 2011	Public R&D % 2010	GBAORD 2010 Euro
1	EU 27	18,61 (tot. 503,7)	-	-	25.100	2,0	61,53	37,51	3.275
2	BE	11,0	1952	1830/1980 (regions)	33.600	1,99	66,3	32,7	2.153
3	BG	7,5	2007	1989	4.8000	0,6	50,0	48,9	96
4	CZ	10,5	2004	1989	14.7000	1,56	62,0	37,4	873
5	HU	10,0	2004	1989	10.100	1,16	59,9	38,4	467
6	IE	4,5	1973	1937	34.900	1,79	68,13	31,9	934*
7	LT	3,24	2004	1990	9.5000	0,79	29,22	70,93	47
8	PT	10,64	1986	1974	16.100	1,59	45,5	44,13	1.763

FIGURE 2.1 Overview over core economic and R&D data

Note: * 2007; GERD (Gross Expenditure on Research and Development), GDP and GBAORD (Government Budget Appropriations or Outlays for Research and Development).

Source: ERA watch (http://europa.eu/about-eu/countries/index_en.htm) and Eurostat 2010.

organizations (Bulgaria and Lithuania).² The processes thus had different preconditions in all seven countries. However, the practical aspirations of the project – to spark national discussions on the potential benefits of TA – were successful in all countries insofar as relevant actors were included in the learning process and debates and came to reflect on possible roles for TA in the national policy-making landscape.

The rest of this chapter presents the results of these national exploration processes in a cross-national perspective. The presentation is based on national country reports (for more details, see Hennen and Nierling, 2012).

Societal premises for the setup of TA institutions

Comparing situations across time and space can help to bring attention to those features of the current situation which serve to enable or hinder institutional entrepreneurship. The following comparison between the situation in which Western European countries originally set up TA institutions with the situation today in other European states aims to serve precisely that purpose.

While our comparison of different national settings partly draws on previous analysis of national TA practices (e.g. Delvenne, 2011, Enzing et al., 2012, Ganzevles and van Est, 2012, Vig and Paschen, 2000), the national explorations in the PACITA project had a very practical intent: initiating a debate on TA or even potentially implementing TA in new national contexts. For this purpose, the most important background information is the societal situation in the 1970s and 1980s which led to the establishment of a number TA institutions in the US and in Europe. This is the historical situation to which we compare the current situation in the countries that we studied.

We consider the following societal features of Western Europe in the 1970–80s to be relevant reference points for current discussions on institutionalizing TA capacities:

- 1 *Highly developed and differentiated R&I systems existed, which had strong backing from governments aiming to strengthen the international competitiveness of their national economies.*
- 2 This was reflected in the setup of research ministries, the growing public funding for R&I and the increasing importance of R&I in parliamentary standing committees.

- 3 *A strong and critical interest of the public towards S&T issues was prevalent.*
- 4 Not only was this critique articulated on the general level, but also citizens' initiatives on different political levels (local-national) fought for participation in planning decisions as well as S&T politics because they were considered to interfere with citizen's rights.
- 5 *Interdisciplinary, problem-oriented science gained influence in several academic fields.*
- 6 The term 'sustainable development' served as a key term for this kind of 'new' research.
- 7 This development in academia also led to academic support for 'TA-like "hybrid science" and policy-oriented research' (Hennen and Nierling, 2014b).

Within this societal situation arose a strong demand by policy makers for reliable knowledge on scientific and technological developments, as well as for methods to cope with public concerns.

In some countries, these demands led to the establishment of institutions which supported national parliaments with non-partisan scientific advice. In other countries, they led to institutions organizing and raising public debate. Thus, TA bodies were institutionalized in different ways each relating to national parliaments and governments (again, see also Chapter 1).

Against this background, the results of the comparative study will be presented below with the aim of showing differences and similarities among the countries with regard to the reference points identified above. First, the current R&I landscape and national R&I performance including ongoing strategies of modernizing and restructuring the R&I systems as well as problems and deficits of the current systems will be described. Second, the levels and central features of political and public debate on S&T will be highlighted. Finally, already existing structures of TA-like research and/or policy advice will be presented.

National R&I landscapes: R&I performance, modernizing strategies and deficits of the current system

R&I performance

In all the countries that we analysed, R&I topics are generally high on the political agenda, reflecting the importance of R&I for economic

development and its relevance for catching up with increased global competition. However, the broader S&T policies are developed in a difficult situation. On the one hand, in most of the countries involved, the economic situation is difficult. With the exception of Ireland and Wallonia, all national economies are lagging behind the EU28 average development in terms of their gross domestic product (GDP). Furthermore, due in part to their relatively weak economic performance, the expenditures and investments in R&I of these countries are (in some cases significantly) below the European average. For the Central and Eastern European countries, this is undoubtedly due to the fact that their economic modernization is a disappointingly slow and conflicting process, involving political and social tensions. Thus, economic growth in these countries seems to be rather fragile, economic forecasts. The people in these countries are disappointed by this development because people had expected fast-paced improvements in their quality of life. Instead, citizens still experience many constraints in different fields: political (democracy-deficit), social (poverty, problems in health care, education, housing and so on) and human-economic factors (high proportion of unskilled workers, lack of job prospects and permanent gap between the developed and backward regions). However, some countries, such as the Czech Republic and Hungary, have already achieved considerable progress in increasing their share of private R&I investment. Both Portugal and Ireland are in a process of restructuring their economies from a model dominated by agricultural structures to a modern knowledge-based economy – and Ireland has been extremely successful in this respect in the last two decades. However, precisely because they were in the middle of a complex and expensive process of restructuring, the financial crisis struck these countries hard and the strain on public budgets led to a decrease in R&I expenditures. Belgium (Wallonia) is the only studied country that can be regarded as being in a position similar to the average European capitalist economies, especially because Wallonia is undergoing a shift from traditional industrial structures to an S&T-based economy and invests heavily in research clusters in order to manage this transition.

Modernizing strategies

Generally, building up the economy sets the main frame for R&I policy making. All the countries that were explored have set up national innovation strategies to modernize the R&I system, attract private investments

and improve competitiveness. The key targets listed in governmental R&I programmes and strategies can also be read as a list of the typical deficiencies of R&I governance, infrastructures and strategies.

In most of the countries that were explored, a set of institutions exists, which give advice to the political sphere (policy makers and government) on a regular basis, be they specialized expert committees connected to ministries, specific funding programmes or national science policy councils. National R&I councils mainly represent Academies of Sciences, industry, universities, public administration and the non-profit sector. They have been established to coordinate reform strategies and to advise the government. In the case of the Czech Republic, the Council for Research, Development and Innovation has almost taken over the role played by a ministry and is more or less designed to centralize the system of R&I and even to take over micromanagement tasks (Pokorný et al., 2012: 69). Because research councils mainly represent academia, industry and public administration, they can be regarded as an element of academic self-administration and expert policy advice. The involvement of industry is meant to establish closer relations between public and private research bodies in order to improve innovation performance. Advice is mainly addressed to the government and rarely to the national parliament.

It is apparent that strategic advice with regard to the future development of research and innovation strategies given by these institutions is motivated by national efforts to improve the competitiveness of the national economy ('economy first'). Compared to these activities, policy advice with regard to future (controversial) technological or scientific development is of minor relevance. This is in line with the fact that foresight methods are frequently applied by governmental agencies to assess the economic strategic planning (for instance, the recently published 'National Research Infrastructure Survey and Roadmap' in Hungary), whereas TA as a means of policy advice is almost unknown in many countries.

Problems and deficits of current R&I governance systems

The country studies reveal a plethora of activities to modernize R&I structures as well as R&I governance systems. The problem is often not a lack of institutional reforms and new agencies but rather a lack of functionality and efficacy. Interviews and workshops revealed scepticism with regard to the effectiveness of newly established systems and strategies by actors from academia and policy making, as well as industry and civil society.

In general, the effectiveness of strategies seems to be compromised by discontinuity and a lack of focus mainly because of quickly changing political agendas driven by short-term tactics and by quickly shifting political power. Discontinuity in setting up reforms is reported as being explicitly a main weakness of R&I policies for Hungary, Bulgaria and Lithuania, due to shifting parliamentary majorities or a general lack of coordination strategies. Thus, innovation strategies are often perceived as 'activism' since they apparently result in constant reorganization of strategic planning. For example, each government in Hungary initiated a reorganization of the policy making and advice structure in R&I at least once in their four-year term (Mosoni-Fried et al., 2012: 113).

Deficiencies in existing advisory systems

A lack of transparency in decision-making processes, and thus of public trust in and legitimacy of policy making, is reported in all countries. A strong need to improve the current situation of national policy advice is expressed in the Bulgarian and Portuguese reports with regard to the legitimacy and transparency of political decisions, as well as setting up missing communication channels between science, politics and the public. In most of the countries that were studied – for instance, Bulgaria – S&T expertise is typically provided internally by governmental staff at the respective ministries. On rare occasions, external expertise is asked for on an ad hoc basis, and even in these cases, the process remains opaque to the wider public (Kozarev, 2012: 42). Although a number of institutions often provide policy advice (for example, a formal advisory body of the government or other national councils) and although an occasional demand for scientific advice from the political sphere exists (for instance the government or parliamentary commissions), there seems to be no institutionalized or 'routinized' ways for constant policy advice. Rather, communication channels among scientists, policy makers and other potential knowledge providers are characterized as 'fragile and dependent on the continuous will of interacting between specific stakeholders' (Almeida, 2012: 235).

Even if processes are formally transparent, with relevant documents for decisions being publicly available and consultation with experts taking place, many interview partners experienced a lack of accountability. It appears that administrations act without taking the arguments

of consultations (be they expert or public) into account. A certain level of distrust in governmental performance on the part of academics or other experts appears to be significant in many of the countries that were explored. In Central and Eastern European countries, this may be related to a great extent to the conflicting character of the ongoing and long-lasting political transition period from a non-democratic system to a democratic one. In Ireland, the reported lack of transparency and public involvement in R&I policy making may rather be rooted in a lack of cooperative traditions and the remaining authoritarian political culture clashing with the country's rather new and fast emergence as an R&I economy. Thus, apparently, the highly developed Irish system of advisory bodies and agencies has not yet opened up to the wider public and remains a closed deliberative circle of the executive branches of government and related expert communities.

Public debate on S&T

Complaints about a low level of political as well as public debate on S&T issues are widespread in interviews and workshops. Generally, a 'systematic integration' of S&T issues in a societal discourse that includes all relevant groups (politicians, scientists and society) seems to be missing. Conflicting factors very well known from Western democracies, such as long-term S&T issues versus short-term political agendas, may have an even stronger influence in countries where democratic structures and cultures are still in transition. Other factors mentioned are clearly connected to the communist heritage in Eastern and Central European countries, such as a 'lack of a debate culture and debate traditions' (Kozarev, 2012: 37) (Bulgaria), or a general scepticism with regard to public debate rooted in the national political culture (Lithuania). Platforms for controversial debate on S&T issues (also in parliament) are missing, and the lack of transparency in decision-making structures – mentioned above – clearly leads to a restriction of debate to a closed circle of experts. The conditions for public debate on S&T are more favourable in Ireland and Wallonia. In Ireland, the interest of politicians in citizen participation has grown remarkably in recent years (O'Reilly and Adam, 2012: 159) due to current technological conflicts at the local and regional levels. In the ongoing political discussion about setting up a TA institution in Wallonia, public involvement is a central topic for those policy makers who are involved.

It adds to the notion of a lack of public debate that public interest in S&T issues is reported to be low in most of the countries. The latter notion is sometimes coupled with a well-known prejudice against laypeople who are regarded by policy makers as being 'emotional and incompetent' (Mosoni-Fried et al., 2012: 126). The notion of a relatively low interest in S&T is supported by European survey data (TNS Opinion & Social, 2010, 2013): the citizens of the countries that were analysed here are less interested in S&T issues than is the average European: they less often read articles on science in newspapers, in magazines or on the Internet, with only Belgium and Ireland being above the European average (TNS Opinion & Social, 2005: 23, 2013: 6). Moreover, for a broad majority of respondents from the countries that we studied, the involvement of experts (scientists, engineers and politicians) is regarded as the most appropriate way to make political decisions in S&T.

The reported 'lack of debate' is to some extent modified by the fact that the country studies outline a broad range of contested S&T issues, such as genetically modified organisms (GMOs), energy policy, waste management and food safety. Specific implications of technologies such as information and communication technologies (ICTs) or ethical concerns in controversial fields such as assisted reproduction were also debated within national contexts. Furthermore, locally or regionally embedded large-scale technological projects such as a dam or an oil pipeline became a subject of national debate. With regard to the development of citizen participation, it should be noted that there are different historical contexts in Western Europe as opposed to the post-communist countries (see Hennen and Nierling, 2014b).

Existing structures of TA-related research and policy advice

The scientific landscape in all post-communist countries in our sample is still very much influenced by the prominent role of the national Academies of Sciences. Although none of the academies were active in the field of TA prior to the PACITA interventions, at least in the Czech Republic and in Hungary, there are traditions of problem-oriented and interdisciplinary research, as well as of applying methodologies relevant to TA (foresight, future scenarios, indicators for sustainable development and more) at the national academies and universities. Since 1998, Hungary has had a strong foresight tradition (Mosoni-Fried et al., 2012: 116), and the work of the academy has taken up current societal topics in

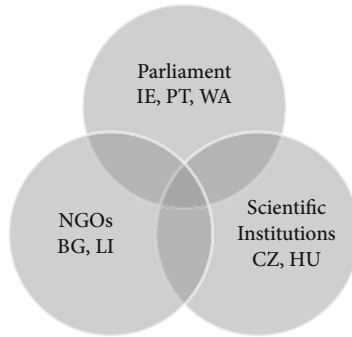


FIGURE 2.2 Possible pathways towards TA

the Hungarian context, such as waste management, food safety, climate change and the red sludge catastrophe in 2010. In the Czech Republic, some institutions already have more concrete experience with TA and TA-like activities, such as the participation of the Czech Academy of Sciences in EU-funded projects on TA, the establishment of the Czech Council on Health Technology Assessment at the Ministry of Health, as well as the Czech participation in various European foresight activities.

In Lithuania and Bulgaria, the science academies currently seem to have a less influential role and also less experience with interdisciplinary and problem-oriented research. In Lithuania, the roles of the Academy of Sciences and of the research council seem to be more formal. Policy advice is provided to the parliament as well as to ministries. However, for the academy, it is more important to take up the mission to promote science and scientific literacy in the wider public (Leichteris and Stumbryte, 2012: 195). In Bulgaria, the Academy of Sciences currently faces major internal restructuring combined with severe problems in scientific knowledge production, which led to the low public reputation of scientists and also to an erosion of trust in scientific institutions in recent years (Kozarev, 2012: 43).

In contrast to the Central and Eastern European countries, in Ireland and Wallonia there are quite a few scientists active in TA-like approaches, such as problem-oriented applied research in the fields of science in society, STS studies, or environmental studies – including a set of PhD programmes, as well as a range of research institutes working in this field. Similarly in Portugal, the most active institutions in fields related to TA are academic ones. Portugal thus has an international PhD program in the field of social sciences and technologies that focuses

specifically on TA, and there are two TA-related stakeholder networks (GrEAT³ and Bioscience) which seem to imply a strong academic focus on TA in Portugal (Almeida, 2012: 235f, Moniz and Grunwald, 2009).

In contrast to Bulgaria and Portugal – where improved organizational procedures are requested – or to the Czech Republic, Hungary and Lithuania – where policy advice mainly aims at strategic planning of science, technology and innovation – policy advice dedicated to the assessment of certain (controversial) technologies is already established in Ireland and Wallonia. In the Walloon region, a wide range of governmental advisory bodies are active with regard to S&T in different fields for ‘technology guidance’ or in the field of environmental assessment. However, the level of cooperation between the different entities appears to be quite low, and their focus is quite specialized. For Ireland, it is reported that since the mid 2000s, S&T policies have increasingly been questioned, which also implies an increased interest in ‘strategic intelligence tools’, including TA and foresight (O’Reilly and Adam, 2012: 160). More recently, the wish for public involvement was renewed during public upheavals due to the protests against shale gas exploitation in 2012. In this context, policy makers started initiatives to enforce public involvement to learn about the motivation of local protests and citizens’ demands (O’Reilly and Adam, 2012: 160).

The deficit in terms of societal involvement in R&I policy making is aptly reflected in the fact that the role of parliaments in R&I policy making is reported to be quite low in most of the countries that we explored. In most of the countries, the focus of parliamentary committees that are in charge of R&I policy making is mainly on higher education. Parliaments are also reported not to have the resources to support their debates with the necessary knowledge on R&I issues. In most cases, parliamentary committees only occasionally organize hearings to improve the knowledge base for debates. Connected with the weak role of the parliaments is apparently also a lack of permanent structures at the interface between science, society and policy making, as reported for Portugal (Almeida, 2012: 230). It is difficult to draw conclusions from the country studies regarding the reasons for the low involvement of parliaments. Explanations given in interviews, such as MPs’ lacking a personal background in S&T, appear to be inadequate. Instead, we might speculate that the low level of public engagement in R&I issues, combined with the general consensus in which R&I is seen as the best guarantee for national economic development, together have the effect

of preventing interest in a thorough deliberation on risks and benefits from arising. This lack of interest might then in turn explain the lack of parliamentary debates.

Ways forward: Possibility structures for TA

For the Central and Eastern European countries, it can be stated – albeit with a few notable exceptions, such as the Czech Republic (see above) – that the concept of TA was widely unknown before the PACITA project introduced it. An aim of our exploration was to first make the relevant actors aware of the idea behind the concept of TA and its practical workings as a tool of policy advice in order to encourage them to reflect and discuss the possible relevance of the concept in their national academic and policy making setting as a second step. This was done with quite some success at the national workshops that were organized as part of the exploratory research. The discussion of the TA concept and its societal outcomes and benefits was continued in the course of the PACITA project, namely by a parliamentary hearing on a European Future Panel on Public Health Genomics as well as by a stakeholder process on urgent questions of the Ageing Society (see Chapter 6 and Chapter 7). Whereas the topics provoked different responses dependent on national political agendas, the format of public dialogue raised intense interest in participatory TA methods in all countries, which resulted, for example, in broad media coverage of the TA events in Hungary and in a stronger commitment of the Hungarian Academy of Sciences to the idea of TA.

Possible institutional models

When it comes to policy options, especially with regard to the further development of a TA infrastructure, the country studies propose different paths which are categorized in the following sections.

Supporters of parliament (Ireland, Portugal and Wallonia)

In Wallonia, Ireland and Portugal, members of parliament or of parliamentary committees expressed their interest in TA, thus parliament was selected as main addressee for TA activities in these countries. The process is furthest advanced in Wallonia where a parliamentary mandate for TA was given in 2008. Ireland and Portugal are at the beginning of

such a process, as both parliaments have expressed an interest in TA. In both countries, the parliaments have a rather weak political role. Whereas in Ireland TA is regarded as a possibility to strengthen the role of parliament (O'Reilly and Adam, 2012: 162), in Portugal the advantages of a TA unit in parliament is seen as a possibility to support the country's 'political, social and economic' development (Almeida, 2012: 237).

In all three countries, the explorations advise using existing institutions for future TA activities to draw on national academic expertise in S&T. Furthermore, a special interest is expressed for participatory aspects in a future TA unit, either to create the first, to improve national experience with methods of participation, or to include relevant stakeholders and the public in political decision making in S&T in the future.

The innovative explorers (Bulgaria and Lithuania)

The national recommendations developed for Bulgaria and Lithuania present a new model for a national TA landscape: the network model. The model basically implies that a network of existing institutions collectively take on the task of delivering TA services coordinated by one organization perceived as legitimate by all involved. In both countries, there was very little prior experience with TA or TA-like activities. However, during the research activities, TA was identified as 'an unrecognized need' (Leichteris and Stumbryte, 2012: 200) by some of the relevant decision makers. The main function of such a network model is to raise awareness of S&T topics in the public and by decision makers in relevant political fields. Both countries consider it helpful to start with a pilot project (similar to the starting phase of some established TA institutions in the 1980s and 1990s; cf. Ganzevles and van Est, 2012) in order to 'prove' the national relevance and to increase the understanding of the TA concept and its 'products'. In Lithuania, this 'proof of concept' is currently set into practice by a group of institutions from academia, public administration and civil society with a range of policy briefs prepared for policy makers to 'showcase' the use of TA (see also Chapter 3).

The institutional traditionalists (Czech Republic and Hungary)

The Czech Republic and Hungary make up a third group. In both countries, the Academies of Sciences are decisive players in the field of S&T policy. Furthermore, the national academies in both countries have been in contact with TA or TA-like activities (especially foresight and S&T

studies). Both evaluate the 'system barriers' (Pokorný et al., 2012: 80) in the current political context as being quite strong and are thus pessimistic about the future establishment of a TA unit. Barriers to be dealt with include a lack of options for national funding, a lack of trained personnel, but also a general lack of interest from the decision-making sector in S&T as well as the public. Interestingly, during the course of the PACITA project, triggered by accompanying activities such as practitioner meetings and participatory events, the academies in both countries got more and more convinced and thus interested in TA-like activities (see also Chapter 3).

Future perspectives for national TA capacities across Europe

Looking back in history, it becomes clear that TA must be understood as a reaction to the failure of a 'technocratic' concept of the relationship between science and politics dominant in the 1950s and 1960s, which relied on scientific knowledge as a safe and sufficient ground for 'rational' policy making. Thus TA, as it were, has always been taking into account the inborn uncertainty and underdetermined character of scientific knowledge with regard to complex practical (political) problems as well as the indispensable need to take into account different (and often conflicting) values, normative claims and expectations held by societal groups. The transparency of the TA process and openness towards the public, involving a broad scope of interests and values have been essential features of the TA concept right from its start.

Our country studies give quite clear indications that the context for TA initiatives (not to speak of processes of institutionalization) is in many respects different from the conditions that were prevailing when the first wave of TA institutionalization took off. In most of the countries that we explored, the concern is not about the further development of an already strong R&I system as it was in Western Europe when TA was established. It is rather about building new structures or about fundamentally reorganizing existing structures in R&I. In Eastern and Central Europe, the R&I landscape is in transition (as it is for other reasons in Ireland and Portugal), and it is less about 'protecting' societal needs and values against the dynamics of S&T. Instead, what is in focus is instigating dynamics and exploring innovation paths to keep up with globalization

pressures and to generate economic growth. The social impact of S&T comes into perspective less in terms of environmental or health risks and ethical issues and more in terms of supporting societal welfare. Thus, TA is expected to provide support with strategic thinking on robust R&I structures, options for innovation policies and the evaluation of existing structures and practices. It is not by accident that whereas TA often is not very well known in the countries that we explored, 'foresight activities' have been widely promoted in some of them.

With the exception of Wallonia and Portugal, parliaments are not active in taking up TA as a means to strengthen their own role. In the beginning of the PACITA process, parliaments were often also not regarded by TA-interested actors as appropriate places for TA activities. This attitude has changed a bit in the course of the project. By now, all partners have increased the cooperation with national parliaments and established connections with national parliamentarians that support the vision of national TA capacities. Countries without established TA institutions have drawn the lesson from the practice of PTA countries as well as from the history of institutionalization of TA all over the world (Hennen and Nierling, 2015), namely that acceptance, acknowledgement and support of TA demand high quality TA activities, on the one hand, and distinguished individuals, mainly politicians who are interested in independent policy advice on technology issues, on the other. There are not too many potential political TA partners in the countries that we have explored so far, but already a few of them are able to do a lot.

Throughout our country studies, a lack of democratic structures in S&T policies is often perceived as well as a lack of communication and cooperation among relevant actors (academia, government, parliament and civil society organizations (CSOs)). TA then comes into perspective as a means of unbiased information of discourses (such as knowledge-based policy making or responsible innovation) or a platform to establish a democratic (public) S&T discourse (independent of reflections on its institutional setting).

In contrast with the conditions under which TA began, S&T is far less an issue of lively public discourse and activism. Whereas the present relatively low public engagement in S&T debates in Western Europe comes with an established system of professional and public authority bodies dealing with risk assessment and ethical issues, such structures are missing in the countries explored here (with the exception of Wallonia). For those examples of public controversies that were reported, it is on the

one hand often stated that they are characterized by a lack of platforms for constructive interchange of actors including CSOs and laypeople. TA is expected to play a role in this respect. On the other hand, ‘the public’ often comes into focus with complaints about a lack of interest in, and knowledge about, S&T issues. As much as this might be in line with a well-known attitude of scientific elites and the prevalence of the so-called deficit model of public understanding of science, this might also indicate a specific problem connected with a lack of trust in democratic structures and with a distance to the political process that goes beyond the usual disenchantment with politics. In all the countries that we explored, there is, to various degrees, a lack of tradition in public debates on S&T as well as a relative lack of structural channels or platforms for public debate (including media and CSOs). Thus, ‘stimulating public debate’ as a mission of TA may gain particular importance here.

On the practical political implications of these features of a – so to speak – new ‘TA habitat in the making’, we see the following challenges in terms of practical expectations that TA has to react to:

- ▶ *Ongoing, often not well-coordinated activities of governments to build up or restructure the R&I system*: In this respect, TA is often explicitly expected to contribute to strategic planning of the R&I landscape and the evaluation of R&I capacities.
- ▶ *Innovation policies to improve competitiveness in the context of globalization and crisis (‘economy first’)*: TA would have to position itself with respect to these activities by providing support for identifying socially sound and robust country-specific innovation pathways (‘constructive TA’) and contribute to lower costs of trial-and-error learning.
- ▶ *Poorly developed democratic and transparent decision-making structures*: TA could find a role here as an independent and unbiased player able to induce communication on ‘democratic’ structures in S&T policy among relevant actors.
- ▶ *The challenge of ‘involving the public’*: In this respect, the motives of democratizing policy making are often merged with ‘paternalistic’ motives of ‘educating the public’ (media and laypeople). The latter nevertheless may indicate a real problem of broad public unawareness regarding the democratic relevance of S&T politics and the extent to which TA’s mission of ‘stimulating public debate’ can adapt to that problem (without becoming ‘persuasive’).

- ▶ *In transparent decision making, lack of trust in democratic structures, lack of competences and bounded rationalities of relevant actors, lack of strategic long-term thinking:* All this results in an explicit demand for ‘knowledge-based policy making’ in the context of which the (not very well-known) concept of TA is welcome as a means to underpin decisions with the best available knowledge in an unbiased manner. Specific ideas about how to institutionally build it into the existing system are, however, missing, and it might well be that in terms of institutional solutions none of the models so far realized in Europe might be appropriate.

In general, TA has to be responsive to the given policy context and the expectations and demands expressed in the countries that we explored. However, ‘being responsive’ to national expectations should not imply giving up a certain (normative) core of TA as a concept. TA risks becoming an ‘empty signifier’ if its proponents seek to respond to any and all demands for ‘rational’ decision making and planning expressed by policy-making bodies and authorities. TA as a concept implies the role of a critical observer of R&I policy-making activities, which necessarily asks for some institutional independence in order to provide space for reflection beyond short-sighted political agendas and openness to a broad spectrum of perspectives being applied in assessment processes.

Notes

- 1 For more details, see L. Hennen and L. Nierling (2012).
- 2 The evaluation is given from a specific organizational perspective and does not claim to fully reflect national debates or newly evolved initiatives.
- 3 Grupo de Estudos em Avaliação de Tecnologia (GrEAT) is a Portuguese network on TA (see <http://avaliacaotecnologia.wordpress.com/>).



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OPEN

3

Adopting TA in Central and Eastern Europe – An Organizational Perspective

Lenka Hebáková, Edgaras Leichteris, Katalin Fodor and Ventseslav Kozarev



Abstract: Hebáková et al. provide from an insiders' perspective the process of adopting and adapting technology assessment to the practices of an already existing institutions. The strategic thinking of four very different organizations in four Central and Eastern European countries is candidly described and contrasted. The authors challenge the notion of technology assessment as a set of ideas and practices to be adopted en bloc. Rather, TA provides a package of inspiration that may help organizations to broaden their missions within the field of national science, technology and innovation policy to include, for instance, parliamentary policy support, facilitation of stakeholder dialogues or citizens' participation.

Klüver, Lars, Rasmus Øjvind Nielsen, and Marie Louise Jørgensen, eds. *Policy-Oriented Technology Assessment Across Europe: Expanding Capacities*. Basingstoke: Palgrave Macmillan, 2016. DOI: 10.1057/9781137561725.0012.

International communication among circles of professionals in policy and administration has always been a core impulse for the development of new institutional forms. But an equally universal prerequisite for the adoption of such new forms is the successful adaption of these forms to the national context. In this process of adaption and translation, entrepreneurs within existing institutions play a crucial role. It is their commitment and energy that propel institutional reforms, and it is their creative negotiation of the 'space of opportunity' which helps to shape nationally acceptable solutions for adoption of new institutional forms.

In this chapter, we zoom in on the process of attempting to adapt TA to the institutional realities of the Central and Eastern European partner countries. We recount this process such as it was experienced by the PACITA partner organizations from those countries.

The inside scoop: taking TA on board in existing organizations

For the Technology Centre of the Academy of Sciences of the Czech Republic (hereafter, 'the Centre'), established 1994 as part of early reforms in the post-soviet era, taking part in PACITA has created a lot of internal interest and debate concerning the concepts and practices of TA. But far from being seen as any revolutionary change, TA is seen to fit naturally alongside already existing organizational priorities. To explain this fit, it is useful to understand the role of the Centre. The Centre is a key organizational player in the development of the Czech STI governance system that provides analytical support for several governmental actors in that field. The Centre often acts as an intermediary among different government bodies involved in STI policy formation, and it serves as a connector to international STI collaboration, serving for instance as the National Contact Points Centre for European Framework programmes for research and providing support to analyses of international innovation systems conducted by EU institutions, UNIDO, OECD and so on. In terms of practices, the Strategic Studies Department, which was directly involved in PACITA, has long provided key services, such as policy analysis and evaluation, bibliometrics and foresight studies. It was the Centre's experience with foresight and its international networks with practitioners from other countries which provided the basis for

the Centre's entrance into the PACITA partnership. And it is alongside this base of experience that the concepts and practices of TA are now becoming part of the organizational priorities of the Centre. From the point of view of the Centre, TA and foresight methodology are seen as part of a continuum of similar activities where the contribution of the TA tradition is its stressing the societal dimension of foresight, the value of participation and the idea of including parliament more directly in the policy process concerning STI issues. The various PACITA activities, including the example projects (described in part II of this book), have provided a welcome opportunity to seek out contacts with parliamentarians. Parliamentary debates concerning TA that were facilitated by the Centre have started a longer-term discussion about possible ways of including TA in the EU Operational Programmes funding research, development and education, as well as the possible role of the Centre as a support function for parliament. But again, this should be seen as a natural expansion of the already crosscutting institutional role of the Centre in the national STI policy system.

In Hungary, the participating Hungarian Academy of Sciences (HAS) has an institutional history that predates the former communist system by a hundred years. As such, it is viewed by the majority of stakeholders in the STI field as well as by the citizens as the most highly trusted public institution. This means that adopting TA takes place on a basis of an already well-established institutional platform and a highly vibrant range of international connections. Because the Academy is already a research-performing organization of significant size, which already has scientific policy advice role on the national level and international cooperation as a core part of its mission, TA is seen perhaps more as an addition to its internal palette of activities and competences than as any significant change in its role vis-à-vis other societal and governmental stakeholders. The Academy's culture is one of strong traditions and a high regard for the role of the scientific expert. The most salient feature of TA for the Academy has therefore been the overall idea of increasing the transparency of STI decision making and offering a platform for dialogue on socially relevant STI-related issues. Participating in PACITA has occasioned reflections on the usefulness of opening up to societal stakeholders in order to increase the societal responsibility of STI policies. Taking up relations with parliamentary representatives proved to be a fruitless effort during the PACITA project. It was partially due to the engagement of the potential partners in the period of the parliamentary

elections in 2014. Here, the organization experienced that debating the concept of TA in broader terms was not as useful as were the example projects, which illustrated much more clearly the value of doing TA. Because the Academy is connected with the capacity-building effect of doing TA events, it will prioritize the creation of further concrete projects to serve as examples and to strengthen the human resource build-up internally in the organization. Such concrete projects, moreover, also serve to build networks of people interested in the specific policy issue being treated. This TA networking function is a key add-on for a few Hungarian institutions and, as such, is a valued outcome of the project for the Academy.

In Lithuania, in contrast to the well-established Czech and Hungarian partner organizations, the Knowledge Economy Forum is a relatively newer organization. The Forum plays an ever-changing role of pushing the development of the national STI institutions, a role which was first defined at the Forum's establishment a little more than a decade ago in terms of promoting business interests. With increasing funding going to early-stage R&D in support of innovation, this early mission was in some sense accomplished, and new steps towards further advancement of the national innovation system had to be found. In this situation, the opportunity presented by PACITA of considering in depth the role that TA may play in the institutional development of the country was well timed. Compared to the 'first wave' of TA institutionalization in Western Europe, the Forum's origins as an interest organization might have been thought to preclude adoption of the traditional role of a TA organization, where 'neutrality' has been seen as a central virtue. But from a reformist perspective, it makes sense in the Lithuanian context to promote greater institutional and political attention around societal issues related to STI. Authors on national systems of innovation have long stressed the need to build trust through cross-institutional dialogue. And social and environmental issues become increasingly important dimensions of international product competition. The Forum has thus come to see its role as promoting in a more complex manner the interests of its constituents through the development of dialogical forms of policy formation that take into account environmental and social issues related to the innovation-driven economy. In promoting this new focus, the Forum has developed a 'network model' for TA (see Chapter 2) in which the plural landscape of many small institutions engaged in STI policy are drawn together around the formulation of

policy recommendations for how to take into account broader impact dimensions of policy. Establishing the legitimacy of this solution is an ongoing process in which a balance is to be found with the institutions that remain from the communist era.

In Bulgaria, the Applied Research and Communications Fund (ARC Fund) has established itself as the premier research organisation into issues related to science and innovation policy. It was founded in 1991, and it is among the first post-communities-independent non-governmental organisation in Bulgaria, as well as one of the very few still actively in operation. Since its inception, its ambition has been to support the development of the knowledge economy in Bulgaria and in Europe by introducing new policy concepts and innovative policy-making tools (such as foresight) by promoting policy consensus among actors in government, industry and civil society and by helping build the capacity of various professional groups. PACITA-project objectives were highly in line with these ambitions, and being a partner in PACITA further enabled ARC Fund to extend its methodological capacity by focusing more closely on the interlinkages among policy, science and technology, especially by stimulating civil society input through various participatory engagement methods. Although the concept and significance of technology assessment have gained in popularity, technology assessment as such is still not widely recognisable among stakeholders. Particularly in parliament, assessments of specific technologies have been performed with regard to social impacts. However, the scope and depth of this analysis were relatively narrowly defined and confined to a specific political agenda.

There still exists the need to define properly the best 'client' for technology assessments as parliament alone is often only the last among a range of policy actors who promote a specific policy development. This is in large part due to the structure of the legislative decision-making system, which facilitates much of the expert-based work to be done within ministries and other government agencies before it is submitted as a proposal to parliament and then debated and enacted within a relative short time frame. This presents ARC Fund with the opportunity (and challenge) to interact with a number of policy actors and to perform a number of functions, functions including expert identification and networking, quality assurance, (science) communication and policy uptake promotion, in addition to organisational and analytical tasks.

Possible new approaches to the adoption of TA

A short opinion poll was taken at the end of the PACITA project among the countries, and these have been classified according to their self-evaluation of the institutional positioning in the STI policy advice. The opinion poll was based on four categories, defined as follows:

- ▶ *Content marketer* shall give politicians their desired ‘shortcut’, but the content marketer institution shall make it as methodologically correct and objective as possible within the limits of available financial and human resources.
- ▶ *Eyes opener* shall give politicians a glimpse what is going on at EU level or in other European countries and raise awareness on important issues. TA can be understood as a broad set of practices aimed at informing, shaping and prioritizing technology policies and innovation strategies, by deliberately appraising in advance their wider social, environmental and economic implications.
- ▶ *Lobby organization* shall aim at building up big coalitions and putting issues on political agendas, not at defending particular interests. Networking shall be used intensively to make personal relationships with policy makers and to form some general positive public opinion on knowledge-based policy making. If the resources allow, policy evaluations can be performed – showing shortcomings of current policies and providing general recommendations for action.
- ▶ *Knowledge sharer* shall concentrate on cross-border European exchange. There will always be a constant need for various examples of how one or another issue is solved in other countries. If Germany, Austria, The Netherlands or some other TA country can afford large-scale research on the impact of technologies developed in their countries on society in general – in the case of Eastern European countries and their budgetary constraints and undeveloped R&D systems – then adapting already existing EU knowledge into the local context might be a more feasible solution. That’s why cross-European cooperation of TA-like institutions is so important.

Representatives were asked to prioritize what is the likelihood that their institution would take over a particular function in the near future. The results are presented in Table 3.1 below.

TABLE 3.1 Likelihood of institution taking over a particular function

Function/Country	Hungary	Czech Republic	Lithuania	Bulgaria
TA as a 'content marketer'	4	1	1	3
TA as an 'eyes opener'	2	4	4	1
TA as an 'lobby organization'	1	2	2	horizontal
TA as a 'knowledge sharer'	3	3	3	2

By way of concluding this inside look, it is clear that adopting a TA role does not equate to taking a step up an evolutionary ladder. Rather, the tradition of parliamentary TA provides ideas and practices, which each organization cherry-picks from in ways that suit their organizational style and institutional role. From the point of view of these organizations, the ambition to expand TA across Europe thus provides a welcome source of new inspiration for already ongoing processes of institutional development and refinement in the STI field.



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4

Technology Assessment for Parliaments – Towards Reflexive Governance of Innovation

Danielle Bütschi and Mara Almeida

Abstract: *Bütschi and Almeida explore TA's importance for policy making today, taking into consideration parliamentarians' needs and expectations. The chapter highlights the challenges policy makers have to face when dealing with science, technology and innovation and discuss how TA can address them at an institutional level. These challenges go beyond the complexity of STI policy issues. Globalization challenges policy making on science and innovation as issues spill over national boundaries. As innovation is increasingly expected to foster growth and employment, policy making has to foster innovation and mitigate risks. And last but not least, the financial crisis is challenging parliamentary democracy with top-down fiscal crisis policies. This is where the advanced dialogical and transdisciplinary practices of TA may add value that other advisory practices cannot.*

Klüver, Lars, Rasmus Øjvind Nielsen, and Marie Louise Jørgensen, eds. *Policy-Oriented Technology Assessment Across Europe: Expanding Capacities*. Basingstoke: Palgrave Macmillan, 2016. DOI: 10.1057/9781137561725.0013.

Science, technology and innovation play an increasingly important role in national and European political agendas. In times of economic and financial crisis, policies in support of research and innovation are being considered as key elements for economic growth and competitiveness, supporting the prominence of innovation in the policy agenda of many countries and of the European Union. At the same time, science and technology developments are challenging existing public policies and legislation due to the impact that they may have in terms of environmental sustainability or social equality. For instance, advances in biomedicine and information technology are leading to ambitious and powerful innovations which will affect health-care systems in Europe. Surveillance technologies used to increase national security may pose problems in terms of data protection and privacy.

The expanding role of science and technology in policy making challenges the role of parliaments in democracy. It becomes increasingly difficult for parliaments to assume responsibility in any meaningful way for the regulation of new technological developments supported by governmental policies. Scientific and technological developments are often of very complex and technical in nature and take place as part of globalized processes where changes occur on a scale that reaches far beyond day-to-day politics. Recent debates and controversies on stem cells, human cloning, genetic testing or nanotechnologies are only a few examples of the difficulties that parliaments face when addressing science and technology developments and related issues.

In this chapter, we discuss how technology assessment (TA) and closely related ('TA-like') approaches can support parliaments in science and technology governance. Alongside Grunwald (2011), we shall argue that TA can contribute to policy making on science and technology 'by integrating any available knowledge on possible side effects, by supporting the evaluation of technologies according to societal values and ethical principles, by elaborating strategies to deal with inevitable uncertainties, and by contributing to constructive solutions of societal conflicts around science and technology'. We shall state that TA is a particularly effective approach to addressing the range of global issues which spill over the borders of nation states, and the chapter calls for parliaments and other policy actors to foster the deployment of TA activities across Europe.

We base our discussion on exchanges made in two parliamentary TA debates that involve parliamentarians and policy makers from across Europe, facilitated by the PACITA project.¹ The aim of these

debates was to build a common understanding of the role of TA for parliaments in Europe and to discuss further developments of TA activities. Parliamentarians and policy makers who attended the debates stressed the importance of having structured knowledge regarding new technologies that takes into account the scientific aspects as well as the interests and values present in society so as to support processes of policy making. They also defended the pooling of TA efforts across Europe – for instance, through an association that involves a large set of institutions or research groups performing TA (or TA-like) activities. Such an association could carry out concrete activities such as conferences, cross-European projects or exchange programmes for TA staffers, which would constitute an essential step towards the deployment and strengthening of TA policy advice in Europe.

Parliaments and policy advice

The increasing role of science, technology and innovation in Europe has major implications for parliaments with regard to technological developments and/or science-related policies. Parliaments have to regulate the development and use of technological innovations in order to mitigate risks or prevent abuses, but also they also have to set the framework for technological innovation to achieve specific policy goals – for example, health, environment or energy – or to meet public concerns such as security, economic and financial stability or employment. This requires parliamentarians, as well as other policy makers, to achieve a comprehensive view on the issues at stake, taking into account the ethical, legal and societal dimensions of science and innovation. For this, they need to rely on scientific advice that fits their needs and is not influenced by lobbyists and interest groups. In the 1970s and 1980s, members of parliaments made the first calls for TA in Western and Northern Europe. At that time, science and technology were subject to vigorous public debates (e.g. nuclear energy, nuclear proliferation, pollution and so on), and parliaments needed independent and comprehensive analyses and advice on policy options that were based on credible and scientific methodologies. Some 40 years later, these claims continue to be valid, even though the world we live in has changed. Public debate and controversies on science and technology are still present but seem to have waned in intensity (see also Chapter 2). However, the issues in debate are

more global and complex, and information is moving very fast; together, these make the provision of well-informed and yet independent and structured policy advice critical. René Longet, a former member of the Swiss Parliament, who in the early 1980s initiated the process whereby TA was installed in Switzerland, stated: 'It is a democratic requirement to organize discussions on the ways to manage and guide technological developments for the good of society'.

The importance of scientific knowledge in policy making is of course not new, and it has contributed to the creation of modern states based on rationalization and bureaucracy (Ezrahi, 1990, Latour, 1993). However, the role of science in policy making has long been conceived in terms of a dichotomy between facts and values, wherein science was considered as the domain of facts and causal relationships and politics was the one of values and decisions. This rationalistic model of policy advice, however, comes up against the reality of contemporary policy making. Social studies of science and technology demonstrated that a strict dividing line between facts and values doesn't exist and stress the fundamental uncertainties in science and technology (Latour and Woolgar, 1979, Bijker et al., 1987). As a consequence, policy makers not only need to base their decisions on comprehensive and structured expertise but also need to broaden the scope of the expertise to define policies and regulations stemming from a constructive dialogue between politics, science, stakeholders and society. The rationalistic approach of policy advice – according to which scientists provide facts, politicians add values and bureaucrats implement policies – doesn't match current policy making anymore. What seems to be needed is a space where all involved actors (policy makers, stakeholders and civil society) can be brought together so that their perspectives can inform policy making on issues of science and technology. As stated by Felix Gutzwiller, a member of the Swiss Parliament, 'Technology Assessment is not only about getting expert knowledge, but also about revealing the views of stakeholders and of the general public through participatory methods'. The view of what TA can bring to policy making goes in line with the Beck (1992) and Beck, Giddens and Lash (1994) analysis on the so-called reflexive modernization, which stresses the need to open up political institutions to all actors of society. Policy advice as delivered by TA is not only a way to bring knowledge in parliaments but also a means to foster and facilitate dialogue among conflicting interests and values based on the best available evidence. In that sense, the TA institutions and practices

that have emerged and developed in Europe may be said to showcase reflexive modernization processes at work (Delvenne, 2011).

Technology assessment for innovation governance

In the tradition of TA, there is a preoccupation with assessing the intended and unintended (adverse) consequences of the introduction of new technologies. This relates to one important area of action for the modern state, which is to mitigate the possible risks of innovation by establishing safeguards and to ensure the safety and quality of products. However, modern states also have the role to drive technological innovation so as to create growth and prosperity and to meet societal needs. In Europe, many high-level policies, strategies and programmes, such as the Europe 2020 strategy, the Horizon 2020 framework program or the Lund Declaration, present science, technology and innovation as central elements to achieving the goals of the the Lisbon Treaty. Such trends clearly affect the kind of policy advice that parliamentarians and other policy makers need: the focus is no longer about mitigating possible risks (risk governance) but about designing innovation so as to avoid adverse impacts (innovation governance). For TA, this implies opening up its traditional risk-based approach and framing its assessment in the wider field of innovation policies.

The approach of Responsible Research and Innovation (RRI) which is currently being developed and fostered by the European Union is regarded as a promising path for supporting the needs of policy makers in innovation governance (Grunwald, 2011, von Schomberg, 2012, Gudowski et al., 2014). RRI refers to ‘a transparent, interactive process by which societal actors and innovators become mutually responsive to each other with a view to the (ethical) acceptability, sustainability and societal desirability of the innovation process and its marketable products in order to allow a proper embedding of scientific and technological advances in our society’ (von Schomberg, 2013). The various methodologies and tools developed by TA organizations – in particular participatory methods – can certainly contribute to the implementation of the RRI approach in concrete policy-making processes that are related to innovation. Several TA institutes already integrated the RRI approach into their work and conduct projects fostering responsible and sustainable innovation paths that involve science, society and stakeholders. This

is also the case of the PACITA project, as the ‘Scenario Workshops on Tele-Assistance and Future Ageing’ aimed at providing input for innovation policies by integrating a wide array of stakeholders so as to meet the societal challenges of an ageing society (see Chapter 7). In such projects, TA fosters a sustained dialogue between research, industry, stakeholders, society and parliaments on innovations and related societal challenges.

Technology assessment in a globalized world

Globalization has broadened the range of issues which spill over the borders of nation states and require international norm setting and regulation. This concerns a wide array of contemporary issues, such as poverty, environmental pollution, financial crisis, organized crime, terrorism and privacy protection. Similarly, scientific and technological developments are increasingly transnational in nature and cannot be addressed at the national level only. The governance of nanotechnologies, for instance, is strongly influenced by supranational institutions – such as the OECD, the European Commission or the European Parliament. In other domains, such as climate change, international organizations such as the United Nations have a strong coordination role in terms of goal settings and action. But this globalization of politics does not mean that nation states are disappearing. Many global issues still need local action and decisions, and they are viewed differently from country to country because of the culturally embedded character of both knowledge and policy (Jasanoff, 2005). For example, several European member states are developing their own policies and regulations relative to nanotechnologies, and recently the European Parliament decided to leave it to each country to decide if they want to authorize the culture of genetically modified organisms (GMOs). In the domain of climate change, it is also up to each country to fix its own objectives and set of actions. Other topics such as ageing society, which many countries have to deal with, also need country-specific solutions, related to the national legal system and cultural characteristics.

Technology assessment has long recognized the importance of addressing the global and cross-border dimensions of science, technology and innovation so as to provide adequate and meaningful advice on the contemporary challenges of our societies. In 1987 the Science and Technology Options Assessment Panel (STOA) was created to carry out expert-based,

independent assessments of the impact of new technologies and to identify long-term, strategic policy options useful to the European Parliament. The European Parliamentary Technology Assessment network (EPTA) was established in 1990 by TA institutes willing to exchange their practices and to bridge the global dimension of science and technology with the specific context of national policy making. Since its establishment, the network regularly invites parliamentarians from European countries to discuss key scientific and technological trends, and it elaborates reports that synthesize the work of its members on specific science and technology issues.² Cross-European projects that are implemented within the PACITA project represent a more structured and institutionalized way of providing cross-border and supranational policy advice to both national parliaments and the European institutions (see Chapter 5 and Part II). In such cross-European projects, a common issue is addressed in several countries through the same questions and with the same methodology, allowing for both a global and local examination. Such collaborative and cross-national approach helps policy makers to look at issues beyond national borders and integrate global challenges into national policy agendas. Findings within the PACITA project also suggest that cross-European projects constitute an opportunity for institutes which are not, *stricto sensu*, TA institutes to join the TA community and develop new skills and new advisory services which are currently not considered in their country.

Putting TA to the political reality test

The PACITA Parliamentary TA Debates were designed to build a common understanding of the role of TA in policy making on science, technology and innovation. The aim was to integrate the views and needs of parliaments in the discussion on knowledge-based policy making in Europe and to reflect on the best approaches to achieve it.

Parliamentarians and policy makers who participated in the PACITA Parliamentary TA Debates have recognized the value of TA to their political work, considering it a democratic tool that besides providing structured knowledge also brings new issues and perspectives into the political agenda and debates. For instance, Maria de Belém Roseira, member of the Portuguese Parliament, told the assembly that ‘we [members of parliaments] have to fight blindness when we legislate, we have to have strategic thinking and we need to be aware through

information. So technology assessment is a very important tool'. Her Austrian colleague Ruperta Lichtenecker shared a similar view and called for 'an open and transparent approach to decision-making in order to improve the quality of decisions reached, to stimulate public debate and to build general awareness on topics that are essential for our future'.

However, the TA approach may compete with other forces that are characteristic of current political decision-making processes. TA operates in a landscape of existent opinions, interests and priorities, and the inputs that it provides for policy making may be drowned out by political bargaining processes and the interplay of various interests, values and strategies. Furthermore, policy makers may select information from TA that supports their opinions and positions rather than using the results of TA to evaluate the available options.

From the perspective of the parliamentarians, another issue to consider when using TA in their work lies in the different time perspectives of cycles in politics and science. Science in general (and TA in particular) is rather well equipped to provide policy advice to decision makers on long-term issues such as innovation strategies or regulation. But matters often arrive without warning on the political agenda for which parliamentarians are expected to react immediately. However, participants of the Parliamentary TA Debates were convinced that the long-term perspective of TA is an essential and unique feature that should be maintained. Several speakers recalled that democracy needs long-term political thinking and that TA is an essential tool to integrate long-term and strategic thinking into politics. According to Joëlle Kapompolé, a former member of the Wallonia Parliament in Belgium, who has been involved in creating a TA office in her region, 'Technology Assessment is the best way to make better decisions for the next generations'.

Reinforcing communication between parliaments and TA

The scientific and political differential processes highlighted by the long-term and comprehensive approach of TA, on one hand, and the constraints of political systems based on representative democracy, on the other, makes it necessary to build permanent and consistent communication between TA organizations and parliaments. It is essential for TA organizations to be aware of the needs of parliamentarians and other

policy makers, as it is important that policy makers know what technology assessment has to offer them. In that sense, the discussions that took place in Copenhagen and Lisbon during the Parliamentary TA Debates were a unique opportunity for the TA community to hear from the parliamentarians themselves about what their needs are with respect to policy advice on science and technology, as well as for the parliamentarians to get a full picture of what TA offers to policy-making processes and to them personally in their daily work and responsibilities. As such, the Parliamentary TA Debates can be considered as the first step towards an enhanced dialogue between the TA community and parliaments on the contribution of technology assessment to knowledge-based policy making in Europe.

Work still needs to be done to ensure that the nature, methods and effectiveness of TA are better and more widely communicated to policy makers, thus sensitizing them to the benefits of TA and enabling the adoption of TA practices more widely (see also Chapter 9 and Chapter 10). In countries where TA is less developed, the growth of TA practices is often slow, not because policy makers do not really want them, but because TA is not formally part of the decision-making process and may be hence seen as an unnecessary barrier to prompt policy making. Even in countries where parliamentary TA has been institutionalized, its relevance – or even existence – is not necessarily noticed by parliamentarians, which can lead to the closure of productive and successful TA organizations. This is what happened to the US Office of Technology Assessment (OTA), which was shut down in 1995 due to budgetary constraints and bargaining without parliamentarians' noticing it. The same happened to the Danish Board of Technology (DBT) after the 2011 election, but in this case the DBT managed to be transformed into a non-profit foundation. According to Ulla Burchardt, who has chaired the German Parliament's Committee on Education, Research and Technology Assessment and now teaches at the Technical University of Dortmund, 'TA is something apart, for which members of parliaments do not receive any recognition for the next election.' Thus, even though a country may have a long tradition of TA, continuous communication with decision makers is necessary to anchor it in the policy-making landscape and to constantly show its added value to parliamentarians.

But building a common understanding of the role and value of TA for policy making requires more than explaining to parliamentarians what TA is and can offer them. Parliamentarians and other policy makers need

to be sufficiently involved in TA activities so that they can take ownership of the results. For instance, parliamentarians may be involved in setting the agenda for TA activities, may be consulted in the course of the project or may pilot TA activities. In some countries, this link between TA and parliaments has been institutionalized, and if we refer to the TA models presented in chapter one, these institutions are based on strong parliamentary involvement (see also Ganzevles et al., 2014). This is, for instance, the case of the French OPECST, where the parliamentarians themselves perform TA and their staffers have an auxiliary function; of the German TAB, whose steering committee is solely composed of parliamentarians; and of the English POST (Parliamentary Office of Science and Technology), which is placed directly inside the parliament and works in close contact with MPs. But for many organizations that try to introduce TA in their country, there are no such formal links with parliament. Thus, such links need to be constructed and fostered so that the TA expertise is connected with the political realities and parliamentarians get the feeling of owning the TA products. For instance, the participation of parliamentarians from all over Europe in the PACITA Policy Hearing on Public Health Genomics was a unique opportunity for the involved parliamentarians to get a better understanding of what TA can bring them when they have to deal with controversial health technologies (see Chapter 6). This project and other similar projects provide evidence that the ability to build consistent communication channels between policy makers and other relevant actors (e.g. technical experts) is crucial for the effectiveness of TA in policy-making processes. And, on a more general perspective, it offers insights on the type of questions and issues that policy makers are likely to raise and have to face when considering complex scientific and technological developments, which is of great value for the deployment of further TA activities in countries or at the European level.

Parliamentary TA in a context of limited resources

In the current context of financial constraints, most countries are facing economic difficulties and budget cuts, making the public resources required to establish TA practices limited. Therefore, parliaments have to find a reasonable balance between the need for independent policy advice and what a TA unit or ‘TA-like’ institution could contribute to the

policy-making process. For instance, parliaments which are currently considering the establishment of a TA unit, but which face budgetary constraints, could consider creating a very small structure (based inside or outside parliament), supported by universities, science academies, research agencies or science foundations. These could support projects that focus on issues of interest for the national political decision-making process, as well as issues of global convergence. The main objective of these projects would be to support members of parliament on policy making and to foster their involvement in TA activities. This work could be supported by fellowships, as in the case of the Parliamentary Office of Science and Technology (POST) in the UK, in which research fellows support the work of the permanent staff.

Another option for countries in which TA is not (yet) well established and is facing budgetary constraints would be to have access to the work done by established TA institutions in other countries. Since many technological issues of interest to policy makers are debated in several countries, some TA groups or 'TA-like' units may 'import' relevant findings made by other TA organizations and analyse them by considering their national context and reflect on the best approaches to start a national debate on the topic in question and involve the relevant stakeholders. According to the resources and TA specific skills available, this option may be achieved by translating TA reports that present, for instance, the state of the art of a scientific field or a meta-analysis of the chances and risks of a given technology, by producing policy briefs on the basis of existing work done by TA institutes abroad and the analysis of the national context and strategic needs of the country, or by initiating a larger process in which local policy makers and relevant national stakeholders would be involved.

Beyond the question of the most appropriate TA institutional model for a specific country, it is important for policy makers to take into account that, while technological innovation is considered a key factor that allows the long-term economic development of a country, TA is uniquely placed to identify strategic options for innovation policies. Moreover, at a time when science and technology are at the centre of growth policies, decision makers need more than ever to rely on tools and approaches that contribute to knowledge-based decision making. This led David Cope, former Director of POST, to state somewhat flip-pantly: 'If TA is what it claims to be, it is at a time of financial constraints that you need TA more than ever, because TA provides pointers towards how to move out of the period of financial constraints.' Following Cope's

statement, although the financial context will impose clear limitations to the establishment of new policy-advice entities, TA should be considered a crucial and strategic asset precisely because it analyses the relevant knowledge and information and then integrates it not only in terms of financial investments and economic growth but also from the perspective of desirable or undesirable societal outcomes.

Final remarks: TA bridging national and European debates

As technological developments have the potential to have large impacts on societies, it is very important that they are democratically debated both by parliaments and, more broadly, within society to ensure that their implications are fully understood and evaluated. This is the task of TA, and during the Parliamentary TA debates participants have repeatedly stated the importance of TA to improve the relationship between parliaments and science, but also the difficulties in maintaining TA activities and disseminating this approach throughout Europe. As stated by António Correia de Campos, former member of the European Parliament and chairman of the STOA Panel, ‘a good understanding of the interactions between science and society is increasingly important for policy-making in order to mitigate risks, to avoid gaps in regulation, and to increase social welfare, making the most out of future opportunities’.

With the exception of STOA, TA activities are rooted within national contexts: TA or TA-like institutions are supported by local or national agencies, and their outputs are expected to contribute to policy making mainly at the national level. However, scientific and technological developments are driven by global forces, and they have implications beyond national borders. In that respect, TA should be able to create and operate in an environment that takes into consideration both the national (cultural, social and historical) and the European contexts, striking a balance between the skills and strategic needs of individual countries and of the European Union. This is a challenge for TA, but it can also be viewed as a chance. In the case of countries which are currently considering the establishment of a TA unit but face budgetary constraints, the fact that parliamentarians have to deal with similar issues as their colleagues in other countries offers opportunities for resource-effective ways of collaboration. It is also a way to incorporate the global dimension

of science and technology in the policy advice of TA. The three cross-European projects organized within the PACITA project, for instance, were designed so as a same issue would be addressed in the same way by several national partners. This clearly reduced the costs for the involved partners, but it also contributed to further opening up to supranational concerns and differences among national policies.

In addition to very concrete advisory activities such as the cross-European projects, many other activities could benefit from cross-border fertilization. The Parliamentary TA Debates, for instance, were a unique opportunity for parliamentarians to meet their colleagues from other countries and compare and learn of certain issues discussed in other parts of Europe. Parliamentarians were fully aware of the relevance of bringing TA up to the European scale: in that respect, the creation of a European-wide networking structure (a kind of 'European TA association') would create the ground for the deployment and strengthening of TA across Europe, as several partners would have the opportunity to work together on a same issue and eventually influence European policy making while having specific activities targeted at the national politicians, experts, stakeholders or citizens. Such a network would also act as a capacity building platform, through conferences, thematic or methodological workshops or exchanges of TA staffers. Not only would this enhanced collaboration be effective in contributing to national and European policy making, but as PACITA proved, it would also foster TA skills across Europe that would support broad and long-term strategies for the development of science, technology and innovation.

Notes

- 1 A first debate was held at the Danish Parliament in June 2012 (Bütschi, 2012), and a second debate took place at the Portuguese Parliament in April 2014 (Bütschi, 2014).
- 2 See, for instance, the EPTA Briefing note on Synthetic Biology (http://www.eptanetwork.org/documents/2011/EPTA_briefingnote_nov2011.pdf).



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OPEN

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Doing Cross-European Technology Assessment

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► **Abstract:** *The authors give a case-based state-of-play account of cross-European TA cooperation in service of national parliaments as well as the European Parliament. Most TA units have formed their role around the specific needs of their national or regional parliaments and other national or regional target groups, making it challenging to shift focus and create new roles for themselves in a European sphere. This article presents recommendations on how cross-European TA can be done in the future with a focus on three aspects of cross-European TA: (1) the added value of cross-European work and lessons from past experiences; (2) the identification of efficient and credible modes of cooperation to conceptualize cross-European TA; (3) the identification of relevant target groups and addressees and the bringing about of impact on the European level.*

Klüver, Lars, Rasmus Øjvind Nielsen, and Marie Louise Jørgensen, eds. *Policy-Oriented Technology Assessment Across Europe: Expanding Capacities*. Basingstoke: Palgrave Macmillan, 2016. DOI: 10.1057/9781137561725.0014.

As a consequence of globalization and European integration, politics is moving upwards, and policy making on many science- and technology-related issues needs a cross-border approach. However, when we look back at the history of European TA, the development and use of technology assessment has been characterized by national and regional efforts, with little capacity for doing cross-European work. As the EU grows, and all European countries become more connected, cross-European TA can contribute to knowledge exchange and capacity building between countries and regions – and as a result provide robust and independent policy advice for European policy makers as well as other traditional target groups in the national context. Issues related to science and technology are often discussed at a European level, and it seems only natural that these discussions should inform each other and contribute to a broader knowledge base for decision making – whether on a regional, national or European level. The PACITA project, therefore, aims at encouraging practices of cross-European TA in order to strengthen the knowledge base for policy making in Europe.

In this chapter, we discuss the challenges of doing cross-European TA in practice and the framework conditions for using TA transnationally at the European level. In the introduction to this book, we have seen how cross-European TA may fit within existing frameworks for European cooperation. This chapter supplements the introduction by providing an ‘on-the-ground’ account of the practical and organizational work that it takes to carry out TA projects in trans-European cooperation. We base our discussion on case studies of previous cross-European projects and on new experiments carried out within the PACITA project, all of which have produced important insights on the added value of cross-European TA and how it may be done in the future. These insights show the diversity and inclusiveness which have become characteristic for cross-European projects. Cooperation and communication across borders not only provide knowledge exchange but create arenas and networks for knowledge production and policy learning among European member states and European institutions. Participation in cross-European projects will therefore benefit society’s ability to comprehend issues related to science and technology and at the same time open up the process of policy making, making it more understandable and accessible for European citizens. Our findings, however, also show that cross-European TA has so far been conducted on a project-by-project basis, which means that new cooperation forms and capacities have to be established for each

project. There is therefore a need to develop a European platform that would ensure support for cross-European projects, with regard to both financial and human resources.

Cross-European technology assessment: current situation

Several research projects and reports have documented the activities and methods of TA in Europe,¹ but few of these have discussed cross-European cooperation and how this can be done in the best possible way. The PACITA project had a goal of making recommendations for the future of cross-European TA, based on lessons learned from past examples of cross-European projects as well as research done in the PACITA project.

Although a STOA report (Enzing et al., 2012) from 2012 describes cross-European TA as limited, there have been several European and international TA projects over the years. Experiences and lessons learned from these projects give important input for further development of work modes, methods and funding schemes. The PACITA project has conducted a number of case studies with the aim of identifying the added value of the cross-European approach, as well as identifying some of the barriers and challenges related to these types of projects.

The EPTA (European Parliamentary Technology Assessment) network is an example of an existing network of European PTA units. Together, the partners of EPTA aim at making TA an integral part of policy consulting in parliamentary decision-making processes around Europe. EPTA has initiated and organized several cross-European projects. These projects² are always funded on the partners own budget, as the network itself does not have any resources. This funding scheme creates certain limitations in the project design, and the method in EPTA projects has over the last years been limited to distributed desktop research, in which all partners write a state-of-the-art chapter from their country/region on a given topic and present policy options. The contributions are then collected and presented in a common report, opened by a short introduction written by the project coordinator. There is rarely any in-depth cross-European analysis of the national contributions, but taking their minimal resources into account, these projects have a good record of accomplishment. Feedback on the joint EPTA projects shows that parliamentarians appreciate seeing how other countries deal with the same challenges as themselves.

Another type of projects is funded through the European Union's Framework Programs,³ like the PACITA project. The projects are based on project calls from the European Commission and cover a broad spectrum of topics. These projects have dedicated budgets that make it easier to use more demanding methods than the EPTA projects. This can include methods that involve citizens or stakeholders in addition to more traditional desktop research. A consortium in these projects often involves several types of partner institutions (universities, NGOs, research institutes, TA institutions etc.).

A third type of project⁴ is commissioned by STOA (the TA unit of the European Parliament) and carried out by members of European Technology Assessment Group (ETAG) or other consortia. These projects have both a dedicated budget and pre-defined target group in STOA. The projects cover a variety of topics and use mostly desktop research and expert hearings as methods. One challenge with commissioned projects is that it can be difficult to identify the most relevant scope for policy makers when taking on topics where extensive research has already been done. That the project is scientifically 'less free' when the project is commissioned by a 'client' can also be challenging.

The PACITA experience

From the pool of previously conducted TA projects, there are several types of projects and consortia which differ with regard to funding schemes, methods, target groups and project designs. PACITA organized three example projects, aiming to produce relevant policy advice at national, regional and European levels. The projects also aimed at enhancing the capacity of technology assessment in Europe by including both experienced institutions and 'newcomers' in the field of TA. On a more practical side, the projects functioned as an introduction and as training for TA practitioners involved in the PACITA project.

The three example projects took on three of the Lund declaration's 'grand challenges', using different methods and involving different types of actors:

While scenario workshops and citizen summits are quite established methods at the European level, it was the first time that the Future Panel was used in a cross-European manner. This 'methodological experiment', together with the two more established methods, has given important

TABLE 5.1 Overview of PACITA example projects

Topic	Method	Involved actors
Personal health genomics	Future Panel	Parliamentarians and experts
The future of ageing	Scenario workshops	Stakeholders
Sustainable consumption	Citizen summits	Citizens

insights on how to organize successful cross-European TA projects (see Part II of this book).

One of the challenges related to the Future Panel method, was the need for long-term commitment by parliamentarians. Earlier experiences with the Future Panel method on the national level have involved parliamentarians who have been appointed to the Future Panel by their parliament (Krom and Stemerding, 2014). A more direct link to the national parliaments (and not only involvement of individual parliamentarians) makes a clearer mandate for participation in the project, and it will probably make it easier for parliamentarians to commit to the project. The two other example projects had a single national event as the main activity. The activity demanded some preparation by the participants (reading information material or scenarios), but it demanded no long-term commitment to the project.

One might argue that by doing such national events, the cross-European element is put in the background. But seeing that both the citizen summit and the scenario workshop had a common European starting point for the discussions,⁵ the participants still got the feeling of being part of a European project. Knowing that there are others having the same discussions, following the same method, somewhere else in Europe was acknowledged and appreciated by the participants. In miniature, the deliberative fora that were created within the projects seemed to engender an experience of European citizenship solidly rooted in national communities. The results from these national events were gathered in European synthesis reports, bringing the results from the national to the European level.

In addition to the policy recommendations produced by all three example projects, an important result is the added value for the TA community. Focus on method training gives all of the involved partners a strong foundation to further use these methods also after the end of the PACITA project, and it enhances the capacity of the involved institutions.

Barriers to cross-European TA

Although there have been a number of cross-European projects that have been conducted over the years (as described above), one cannot speak of regular cross-European TA having been done.

National vs European commitments

However, a tension might occur for each individual organization between doing national projects and participating in European projects. This tension may act as an obstacle for developing cross-border collaboration. Easing this tension might be a factor that can lower the threshold for TA institutions to engage in cross-European TA. Most of the existing TA institutions have their mandate mainly focused on the national and regional spheres. Some have an identified task to ‘watch trends in science and technology’ (on both the national and the international level) (Ganzevles and Van Est, 2012), but none have international cooperation as a defined task. Identifying and understanding the added value in cross-European projects may help to open up and stimulate more cooperation and at the same time justify international cooperation with regard to mandates and resources, without stealing attention away from national working plans.

Finding a European audience

One of the main characteristics of the traditional TA units has been their strong connection to parliaments (see also Chapter 1). This relationship has often been institutionalized either by organizing the unit inside parliament or by stating this relationship in the mandate of the institution. Some 40 years later, the audience of TA or TA-like institutions is wider and includes all actors involved in policy making – that is, members of parliament, but also governmental representatives, civil society and even the scientific community. However, these actors are mainly nationally based, showing that the audience of TA lies within usually national (or regional) frontiers.

When TA activities take place at the European level, it becomes more difficult to create permanent relationships with addressees and potential target groups than in national projects. In national contexts, there exists a defined public sphere, although there is no clearly defined ‘European public’. One possible approach is to have a broader view of addressees and

target groups when working at the European level than at the national/regional level. If the goal of TA is to give input for evidence-based decision making, it might help to widen the definition of who decision makers in fact are. In the European context, the European Commission and the European Parliament play important roles as policy makers. But Europe is multifaceted and consists not only of the European Union; many others (lobbyists, NGOs and the media) take part in decisions and hold power in important discussions about the policy issues and options. Therefore, all those organizations and institutions can be potential target audiences for cross-European TA, on the European as well as the national level. Nations are an important part of, and often the operative level, European policy making. They should, therefore, also be an addressee of cross-European project results. In order to reach such an audience, focus should be on communication efforts and on forming clear and targeted policy advice.

One important audience is the TA community itself. Results from successful cross-European projects can be used at the national level from institutions not involved in the specific project and also as an encouragement for participation in future cross-European work. This would contribute to a bigger pool of evidence of cross-European work – hence raising the legitimacy and the trust in a cross-European approach and in TA methods.

Benefits of cross-European TA

Based on the challenges related to European projects, it is important to identify the defining elements of cross-European TA and to understand what makes technology assessment an important contributor for policy advice in Europe.

For society

The emerging technologies debated in different countries are more or less the same. But contexts and timing of discussions, and the shaping of technologies, will differ nationally. Thus, cross-European TA can contribute to agenda setting and provide policy support at the European level and at the same time inform national science and technology discourse. This has already been identified in the area of European science policy, moving from 'science in Europe' to 'European science' (Nedeva and

Stampfer, 2012). Focus has moved from coordination of national projects to the development of a more integrated, pan-European science base. When topics are relevant across borders, it's reasonable to think that it would be more effective to make projects on a cross-European basis rather than have every TA unit do similar projects in their country/region.

For parliaments

In the 1970s, when TA started to get institutionalized in Europe, the influence of the American tradition of TA was evident. However, as argued by Norman J. Vig (2000), the European approach to TA turned out as more of a democratic project than it had been in the US, where the focus had mostly been on creating an informed policy debate on science and technology issues. Introducing TA in the diverse and culturally varied Europe, TA became a strong instrument in the democratic process, providing independent and thorough advice for parliaments, based on participation of a broad group of actors. This is also one of the reasons for the survival of these organizations, Vig argues: they have proved useful for parliaments.

For TA institutions

PACITA is in itself a good example of how TA institutions benefit from doing cross-European projects. PACITA strengthened the ties between the existing TA units, and it also helped establish a strong base for further institutionalization of new initiatives in Europe. Doing PACITA's three example projects proved that participation in cross-European projects is highly productive from a practitioner's point of view. The cooperation provided institutional learning and an exchange of experience between TA practitioners, and the hands-on experience from the projects created enthusiasm for TA both among the participating institutions who were new to the field and among the policy makers who received the results.

Requirements for realizing cross-European TA

An essential element of TA is the notion of independence. This refers to the independence of TA institutions from stakeholders' interests and influence, as well as the independence from funders and policy makers

themselves. Independence is important to maintain the TA institution's credibility, and it will strengthen the reputation of TA in Europe at a more general level. Giving well-founded and independent advice is one of the main strengths of TA, compared to policy advice from NGOs and lobby groups, who have their own interests in mind.

Future cross-European TA initiatives should be both inclusive and diverse. Acknowledging that others see similar challenges but deal with them differently can lead to knowledge and new perspectives. Cross-European TA can contribute to agenda setting and policy support at the European level and at the same time inform national science and technology discourses. The PACITA project had a variety of partners, not only traditional PTA institutions. The diversity of the consortium combined with the cultural backgrounds of the countries and regions involved created a learning process for all partners – and contributed in new knowledge production for policy makers. However, there will always be challenges related to cross-European participation and national financing. Seeing that the financial situation of the different national and regional institutions varies, it is difficult to ensure the diversity of TA on the European level.

In the last few years, the field of TA has changed. Several institutions have been transformed and reorganized, and one can see a need to broaden the scope of European TA, from purely parliamentary TA (PTA) to forms of TA that approach policy making in a broader way. PACITA's efforts in expanding TA throughout Europe highlight the democratic approach to TA that is taken in Europe, and the introduction of TA in new countries, regions and cultures will add value to policy makers and the TA community. A more permanent and stable presence of TA at the European level also will serve as important support for TA initiatives in the future.

Creating a permanent and stable presence of TA on the European level, and making it easy and desirable for TA institutions to participate in cross-European projects, demands more systematic funding than is provided today. The experiences from previous TA projects might seem to argue that as long as there are funding mechanisms available, such as the EU framework programmes, then cross-European TA will continue to exist. However, there is a strong belief that cross-European TA can grow even stronger if there is more systematic financing for cross-European cooperation, which is not limited to individual projects. A continuous presence, such as in the format of a TA Platform, will make

a stronger impact than individual national institutions coming together for projects now and then (see also Part III of this book).

There has been an increase in cross-European initiatives in the field of TA. This is reflected in the number of projects, the number of participants and the involvement of new countries and institutions. The TA community in Europe has historically been oriented towards producing policy advice for national and regional parliaments. Because of the shifting landscapes in Europe, it makes sense to extend the addressees to a wider group of policy makers. This move will give greater opportunities for making an impact in a wide range of policy processes. At the same time, it will open the field of TA to participation of a broader group of institutions, not only the 'traditional' institutions doing parliamentary technology assessment. A variety of institutions are now active in the field of TA in Europe. They all have to find their own strategies for how to be agile and flexible enough to participate at European level, yet at the same time deliver results to the national policy makers.

The three example projects organized during the PACTIA project have provided insights on three of the grand challenges that our societies will face in the coming decades. The approaches made available through technology assessment has produced important input for policy makers and also demonstrated the important role that institutions for technology assessment can play at the national and the European level. Experiences from these three projects highlight especially two methods that work well on the cross-European level: citizen summits and scenario workshops. Having a common starting point (information material or future-oriented scenarios) in national activities gives the approach a common thematically starting point, but it also allows room for the cultural and social differences in countries and regions. This also produced output that is valuable for national, regional and European policy makers.

Final words: making an impact

In the end, the goal of TA is to make an impact on policy making. And its 'impact' can be manifold. It can contribute to bringing new or independent knowledge to science and technology themes or to the related societal aspects in policy-making processes; it can contribute to agenda setting; it can act as a mediator or facilitator between stakeholders; or it can lead to new policies or regulations being made (Decker and Ladikas, 2004).

Even though some institutions have formal relationships with important policy makers, these policy makers are not demanded to act upon the advice coming from the TA community. One of the main characteristics of TA is its way of bringing together knowledge from a broad group of actors into the production of independent and well-grounded policy advice. By using existing as well as by further developing traditional methods, the TA community should strive to enhance evidence-based policy making at the national, regional and European levels.

The developments and discussions related to science, technology and society move forward with increasing pace. In order to advise policy makers on these developments as they unfold, TA institutions must be present and in contact with their target groups at all levels. Seeing that these developments happen on a European level and an international level, the need for cross-European TA is evident. Cross-border knowledge exchange and learning is highly relevant for policy makers in our societies today, and cross-European TA represents one way of making this happen.

Case studies based on the following projects:

- ▶ Energy transition in Europe (2007)
- ▶ Genetically modified plants and foods (2009)
- ▶ ICT and privacy in Europe (2006)
- ▶ Energy transition in Europe (2007)
- ▶ Genetically modified plants and foods (2009)
- ▶ ICT and privacy in Europe (2006)
- ▶ Challenges of Biomedicine (2007)
- ▶ CIVISTI (2011)
- ▶ Meeting of Minds (2006)
- ▶ Study on Human Enhancement (2009)
- ▶ Nanosafety (2011)
- ▶ Technology Options in Urban transport (2011)
- ▶ PACITA example projects: Personal Health Genomics, the future of ageing and sustainable consumption (2013–15)

Notes

- 1 For example, EUROPTA (2001) and the TAMI project (2004).
- 2 Examples from the case studies include ‘Energy transition in Europe’ (2007), ‘Genetically modified plants and foods’ (2009) and ‘ICT and privacy in Europe’ (2006).

- 3 Examples from the case studies include 'Challenges of Biomedicine' (2007), 'CIVISTP' (2011) and 'Meeting of Minds' (2006).
- 4 Examples from the case studies include 'Study on Human Enhancement' (2009), 'Nanosafety' (2011) and 'Technology Options in Urban transport' (2011).
- 5 Information material and short films for the citizen summit, as well as scenarios in the scenario workshops.



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Part II

Exemplifying Cross-European Technology Assessment

