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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.

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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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