Karlsruher Institut für Technologie

Institut für Technikfolgen-abschätzung und Systemanalyse

TECHNIKFOLGENABSCHÄTZUNG
Theorie und Praxis

24. Jahrgang, Heft 1 – Februar 2015

Editorial 3

Schwerpunkt

TA as an Institutionalized Practice – Recent National Developments and Challenges

L. Hennen, L. Nierling: Taking Stock of TA in Europe and Abroad. Introduction to the Thematic Focus 4

R. van Est, J. Ganzevles, M. Nentwich: Modeling Parliamentary Technology Assessment in Relational Terms. Mediating Between the Spheres of Parliament, Government, Science and Technology, and Society 11

P. Delvenne, N. Charlier, B. Rosskamp, M. van Oudheusden: De- and Re-Institutionalizing Technology Assessment in Contemporary Knowledge-Based Economies. A Side-by-Side Review of Flemish and Walloon Technology Assessment 20

K. Böhle, A. Moniz: No Countries for Old Technology Assessment? Sketching the Efforts and Opportunities to Establish Parliamentary TA in Spain and Portugal 29

E. Leichteris: Is There a Chance for TA? Reflections on the Perspectives for TA in Eastern/Central Europe 44

J. Sadowski, D.H. Guston: Technology Assessment in the USA: Distributed Institutional Governance 53

A. Ely, P. van Zwanenberg, A. Stirling: Experiments in Technology Assessment for International Development: What Are the Lessons for Institutionalisation? 59

W. Peissl, M. Barland: Cross-European Technology Assessment: Visions for the European TA Landscape 68

Nachruf

St. Böschen: Zum Tode von Ulrich Beck: Weiter Denken 75

Diskussionsforum

Chr. Berkenkopf: Mit grüner Biotechnologie zum größten Glück der größten Zahl? Ein Gedankenspiel zur doppelten Profitabilität gentechnisch veränderter Pflanzen 77

T. Hagendorff: Technikethische Werte im Konflikt – Das Beispiel des Körperscanners 82

Fortsetzung Seite 2

Fortsetzung des Inhaltsverzeichnisses

TA-Projekte

S. Pannenbecker: Neue Wertschätzung für Lebensmittel. Rückblick auf vier Jahre „Runder Tisch“ in Nordrhein-Westfalen 87

T. Kopp, J. Schöchlin: Neue „Schlappen“ im Familiennetz 91

Rezensionen

T. Lemke: Die Natur in der Soziologie. Gesellschaftliche Voraussetzungen und Folgen biotechnologischen Wissens (Rezension von U. Dolata) 96

D. Klumpp, K. Lenk, G. Koch (Hg.): Überwiegend Neuland. Positionsbestimmungen der Wissenschaft zur Gestaltung der Informationsgesellschaft (Rezension von A. Weber) 98

Tagungsberichte

Mobilities: Past, Present, and Future. Report from the Conference “Spinoffs of Mobility: Technology, Risk & Innovation” (Philadelphia, PA, USA, September 18–21, 2014) (by K. Oswald, S. Zimmer-Merkle, M. Edelmann) 103

Der ländliche Raum als Schauplatz der Energiewende. Bericht zur Tagung „Energiewende im ländlichen Raum – Ein Bürgerprojekt auf dem Prüfstand“ an der Evangelischen Akademie Tutzing (Tutzing, 25.–26. Juni 2014) (von F. Braun, M. Knapp) 106

Responsible Research and Innovation – Perspectives and Challenges. Report on the S.NET 6th Annual Meeting: “Better Technologies with No Regret?” (Karlsruhe, Germany, September 21–24, 2014) (by A. Khodzhaeva, M. Sand, M. João Maia, S. Woll, G. Velloso, D. Frank) 111

Ethik des Essens: In-vitro-Fleisch und „verbesserte Tiere“. Bericht zur Konferenz „The Ethics of In-Vitro Flesh and Enhanced Animals Conference“ (Rothbury, UK, 18.–19. September 2014) (von A. Ferrari) 115

Assessing Technologies: Global Patterns of Trust and Distrust. Report on one session at the XVIII World Congress of Sociology (Yokohama, Japan, July 13–19, 2014) (by A. Moniz) 119

ITAS News 122

TAB News 126

NTA News 129

EDITORIAL

Liebe Leserin, lieber Leser,

es ist Februar und Sie halten die erste Ausgabe 2015 der „Technikfolgenabschätzung – Theorie und Praxis“ in Händen. Dieses Heft erscheint ausnahmsweise früher im Jahr als sonst. Der Grund: Ende Februar findet die internationale Konferenz „The Next Horizon of Technology Assessment“ in Berlin statt, die bislang größte TA-Konferenz, die sich explizit aktuellen Forschungsfragen der TA sowie den besonderen Herausforderungen einer politikberatenden Wissenschaft widmet. Diese Konferenz wird im Rahmen des EU-finanzierten Projekts „Parliaments and Civil Society in Technology Assessment“ (PACITA) organisiert und vereint an drei Tagen 300 Teilnehmer aus über 30 Nationen. Um „parlamentarische TA“, also diejenige Technikfolgenabschätzung, die in politische Beratungsprozesse der Legislative eingespeist wird, geht es auch im Themenschwerpunkt dieses Heftes.

Die im Schwerpunkt versammelten Beiträge fragen nach den institutionellen Bedingungen erfolgreicher parlamentarischer TA. Die Fallstudien zeigen anschaulich, dass jedes Land anders „tickt“. Folglich existiert kein allgemeingültiges Rezept, wie eine parlamentarische TA-Einrichtung nach Maß zu „backen“ sei. Und – um beim Vergleich zu bleiben – ähnlich wie in einer guten Backstube sind auch bei der parlamentarischen TA traditionelles Handwerk ebenso nötig wie Kreativität und Mut, Neues auszuprobieren.

Im PACITA-Projekt haben Projektpartner aus sieben Ländern, die parlamentarische TA haben, mit Partnern aus sieben Ländern, die keine parlamentarische TA haben, zusammengearbeitet. Die vielleicht für manchen überraschende Erkenntnis bestand darin, dass auch diejenigen, die ihr Handwerk seit Jahrzehnten betreiben, gut daran tun, ihre Methoden und Rezepte kritisch zu betrachten und – wo nötig – die ein oder andere Zutat zu ändern, um auch in Zukunft erfolgreich beraten zu können. Institutionalisierungen sind unabdingbar für eine dauerhafte und verlässliche Politikberatung. Allerdings zeigen die Beispiele gelungener (wie misslungener) TA-Institutionalisierung, dass landestypische Besonderheiten im politischen System ebenso wie die jeweilige Gesellschaft erheblichen Einfluss auf die Ausgestaltung und das Erfolgsrezept der jeweiligen TA-Einrichtung haben.

Dear reader,

it is February and you hold in your hands the first issue of the journal “Technology Assessment – Theory and Practice” in 2015. Exceptionally, this booklet is published earlier than usual in the year. The reason: At the end of February the international conference “The Next Horizon of Technology Assessment” will take place in Berlin. It will be one of the largest TA conferences in history and will be explicitly devoted to current research questions of TA as well as to specific challenges of a policy-advisory science. The conference is organized within the framework of the EU-funded project “Parliaments and Civil Society in Technology Assessment” (PACITA) and brings together for three days 300 participants from over 30 countries. “Parliamentary TA”, that means technology assessment providing parliamentary advice, is also the main topic of this issue.

The articles in this special issue examine the institutional conditions for successful parliamentary TA. The case studies clearly show that things work differently in each country. Consequently, there is no universal recipe or magic formula for “baking” the best parliamentary TA. And – to stick to the comparison – like in a good bakery, traditional crafts are just as necessary as creativity and courage to try something new in parliamentary TA.

In the PACITA project, seven institutions from countries where parliamentary TA is institutionalized worked together with institutions from countries without parliamentary TA. Perhaps the most surprising finding was that even those who have practiced their craft for decades should critically revise their methods and recipes and, if necessary, change the one or other ingredient in order to advise successfully also in the future. Institutionalization is essential for durable and reliable policy advice. However, the examples of successful (and unsuccessful) TA institutionalization show that the specifics of a country’s political system and society have a strong influence on the design and success of the respective TA institution.

Constanze Scherz

SCHWERPUNKT

Taking Stock of TA in Europe and Abroad

Introduction to the Thematic Focus

by Leonhard Hennen and Linda Nierling, ITAS

The idea of analysing a societal problem in the most comprehensive way, i.e. taking into account all the relevant scientific and societal perspectives in order to allow for rational decision making for the common good, may well be said to be as old as the idea of modern democracy. Legitimate policy making, understood in a liberal sense, is rooted as much in the notion of the people being the sovereign and political institutions representing them as it is in the concept of "reason" represented by "objective" scientific knowledge (Ezrahi 1990). It is difficult to say precisely when this idea developed into a concept, namely of systematically analysing the impact and effects of modern technology in an unbiased and comprehensive way to provide decision makers with a reliable and inter-subjectively acceptable source of knowledge. A demand for and supply of scientific expertise on the uncertain and probably detrimental effects of technology can be traced back to early industrialization (see e.g. Radkau 1989). The date when this concept was baptized "technology assessment" and it was suggested that it be "institutionalized" in the political sense of being embedded in a non-temporary organizational entity with a definite role in political decision making can be given as 1967, when US congressman Emilio Q. Daddario in a report to the US congress pled for "strengthening the role of the congress in making judgements among alternatives for putting science to work for human benefit" (quotation according to Vig/Paschen 2000a, p. 3). In the same year, the same congressman introduced a bill stipulating the establishment of suitable procedures in the congress, which led in 1972 to the decision to establish the Office of Technology Assessment as a congressional agency, which has become the role model for many subsequent parliamentary TA units.

Ideas and concepts are entities of elusive character, "mind games" that in order to become "operable" have to materialize into rules and practices, which again can be cast into some form of organizational structure that provides for continuity and interaction with (or functionality for) other practices. In the case of TA, the institutional form has to provide for links to science, society and foremost politics as TA is intended not only to provide insights but mainly to use these to inform decision making. The concept of TA is open to being taken up by academia, civil society organisations or industry. For democratic reasons, the legislature has always been at the centre of TA's ambitions since it constitutes an interface between the public and the government and is the place for public deliberation of public problems. As the process and the result of institutionalization in Western Europe have shown, however, a wide variety of modes of parliamentary TA are possible, and the mission is not necessary only to inform parliament but especially in many European TA institutes to inform and stimulate public discourse. And looking beyond parliamentary TA, if TA can be regarded as a "democratic innovation involving parliaments, scientists and the public sphere" (Böhle/Moniz this issue), the possible forms of institutionalization can be manifold depending on a broad set of boundary conditions.

It has been the aim of the current EU-funded project "Parliaments and Civil Society in Technology Assessment" (PACITA)[1] to explore the opportunity structures for and barriers to strengthening the TA concept in the national political contexts of seven European countries where TA infrastructures are not yet in place, be it for national parliaments, or elsewhere in policy making and society. The overall PACITA objective is to empower European member states and associated countries with an interest in TA to make informed decisions about institutionalizing, organising and performing parliamentary TA. At the same time, PACITA is meant to stimulate reflection in regions and countries with established TA organizations (http://www.pacitaproject.eu). The insights, reflections and debates initiated by PACITA about a possible "next wave" of TA

(Hennen/Nierling 2014) are in a way the starting point for the present selection of articles about the institutionalization of TA in this thematic focus of this issue of *TATuP,* which also serves to enrich the PACITA debates on institutionalization.

We present this selection of articles on the following topics that we consider relevant for further understanding the process of TA institutionalization, namely the history of TA institutionalization, the different forms of TA in the current landscape (TA units and forms of distributed governance), the risk of the de-institutionalization of TA that reflects the political side of TA, and the national and international scope of TA. Questions that are addressed in the present issue of *TATuP* are thus: What are the implications of institutional models and what are contextual prerequisites (societal, political, economic and cultural) for TA to flourish, and might they be different in different national, international or historical contexts?

1 A Short History of the "Institutionalization of TA"

Technology assessment as a means of providing policy advice on matters of S&T policy making has been introduced in many Western industrialized countries starting from the late 1960s. Having its scientific origins in systems analysis, planning and forecasting, the field of TA has continued to develop both with regard to conceptual approaches and to research methods. A central and persistent feature that is connected to its founding idea is its orientation on practical problems of policy making (Decker/Ladikas 2004). In particular, national parliaments have always been regarded as the main addressee and client of TA. From its beginnings at the U.S. Congress in the 1970s, TA has always been tied to two impulses that have driven its development (Guston/Bimber 2000): One drives towards expert analysis, while the other drives towards public deliberation. Accordingly, two models of TA have been pursued throughout the history of TA: a policy analysis model and a public deliberation model. The policy analysis model was predominant when the Office of Technology Assessment (OTA) was established at the U.S. Congress in 1972. Congress intended to provide a broad base of knowledge for its own deliberations and decisions by creating an institution that should be able to inform legislators on any new developments in S&T and should function as an "early warning" facility with regard to possible problems and needs for political intervention.[2] The policy deliberation impulse was highly important for the foundation of a series of TA institutes associated with national parliaments in Europe in the 1980s and 1990s. This "second wave of TA" (Rip 2012) has consequently been connected with a focus of TA on the involvement of stakeholders and the wider public in TA processes. Parliamentary TA in Europe took up the heritage of the OTA but differs from it in many respects, both organisationally and with regard to methodologies and mission (Vig/Paschen 2000b; Hennen/Ladikas 2009; Enzing et al. 2012; Ganzevles/van Est 2012; Hennen/Nierling 2014).

The situation regarding the political institutionalization of TA is nowadays characterized mainly by the European Parliamentary Technology Assessment Network (EPTA), which comprises 13 national parliamentary TA institutions including the TA body of the European Parliament with another three associate members with a close relationship to their national parliaments (http://www.eptanetwork.org). In addition there are many other active organisations or units at universities or other public research institutions and authorities as well as private think tanks that offer their advice to governmental bodies as well as to private enterprises and to civil society organisations from the local to the international level. No overview is available of the TA landscape in this respect. The manifold contributions by TA practitioners with all kinds of backgrounds to *TATuP* and the documented individual and institutional membership in the German-speaking TA Network may serve as a proxy (http://www.openta.net/netzwerk-ta). For the US, the article by *Sadowski/Guston* in this issue provides at least a sketch.

With regard to the political and national (or international) levels of government, there still are big white spots in the TA map. Especially for Europe – given the existing European R&D policies and its ambition to establish a "European Research Area" – the expansion of the TA landscape to many Southern, Eastern and Central European countries can be considered a challenge.

In these countries, the idea and concept of TA (not to speak of institutional bodies) is either widely unknown (see *Leichteris* in this issue) or – despite an often longer history of debates among political and scientific advocates – has not succeeded yet in gathering enough support from influential actors to materialize into some form of institution (see *Böhle/Moniz* for Portugal and Spain, or *Delvenne et al.* for Belgium/Wallonia in this issue).

2 Forms of Institutionalization

In the existing literature on TA institutions, the focus on parliament is usually very strong. Historical, political and cultural reasons are used to trace the path and the specific mission with which a TA institution was set up for a parliament (Vig/Paschen 2000b; Enzing et al. 2012; Delvenne 2011). This often highlights the diversity of different TA models, practices and effects. Three primary institutionalization models of TA have become very popular for describing European TA institutions: the parliamentary committee model, having a parliamentary committee leading a parliamentary technology assessment unit; the parliamentary office model, describing a specific office to accomplish TA studies at the request of parliament; and the independent institute model, where a TA institute operates outside parliament but with parliament as main client (e.g. Hennen/Ladikas 2009; Enzing et al. 2012).

In this issue, the state of discussion of different institutional models of TA is taken a step further. Without a doubt, parliament was the first and most important addressee of TA. In times where science and technology issues form prominent items on political agendas, a range of parliaments in Europe followed the US example and initiated an institution providing parliament a better capacity to control the government's decisions in S&T policy making. In its institutional practices, however, the scope and reach of TA today goes beyond this connection to parliament. Currently, there are a number of institutionalized forms of TA in Europe – be it connected to the parliament, to the government or to the scientific system. The contribution by *van Est*, *Ganzevles* and *Nentwich* thus argues in favour of opening the strong parliamentary perspective of TA also and equally to other important actors, namely the government, the science system and society. Based on empirical research into the current practices of TA institutions in Europe, they develop a modelling approach giving TA institutions a function of mediating science and technology issues across four spheres: parliament, society, government, and science. The diversity of national models which is outlined in their contribution shows the social and political specifics of a TA institution and – especially for new TA players – the necessity of finding one's own place and model of institutionalization (see also the articles by *Böhle/Moniz*, *Delvenne et al.* and *Leichteris*). It also intends to offer a continuous tool for existing institutions to let them determine their own place – and maybe also any necessary strategic shift – in relation to their European counterparts.

Having one institute specifically dedicated to TA is the most obvious form of an institutionalization of TA. Interestingly, two articles in this volume provide more flexible understandings of institutionalization. The contribution by *Sadowski/Guston* describes a distributed model of institutionalization for the current US context. Here, TA competence and functions are scattered across a range of institutions from all the four of the spheres identified above. The article shows that although OTA – as the "mother institution" of TA and still an important point of reference for European discussions – ceased to exist long ago, the US can offer a way that either can be developed into a new institutional mode or at least may serve as a good starting point for future initiatives for parliamentary TA. Even without a fixed TA institution, TA as such seems in the meanwhile to be deeply anchored in society and some of its institutions, so that a distributed model of TA can be described for the current US landscape.

Another "flexible" institutional model is proposed by *Leichteris* in his contribution on the state of the art of TA in Central and Eastern Europe. He proposes a network model of institutionalization for these countries with no tradition of "thinking in TA terms", a lack of trained personnel and merely an "unrecognized need" for TA by political and societal actors. This (rather transitional) institutional model serves to unite the existing "forces" for the way ahead.

3 The Other Side of the Coin: De-Institutionalization of TA

The process of setting up a central body of technology assessment with the function of providing independent advice to the national policy-making level is often – as is proven by the history of many parliamentary TA units (see contributions in Ganzevles/van Est 2012; Vig/Paschen 2000b) – a long and winding road of initiatives, a search for TA advocates in the academic and political system, a search for supportive coalitions across existing political factions, a constant argument against hostile positions from relevant players in the innovation system and a defence against accusations of allegedly following a hidden agenda of "technology arrestment" and the like. This corresponds to the experience of many practitioners and supporters of parliamentary TA bodies that it is part of their daily business (even after years of established successful practice) to prove the usefulness and functionality of scientifically sound, non-partisan political advice under conditions of quickly changing political agendas and changing political personnel, resulting in changing expectations and interests of its client. In the case of the parliament, the fact that "the client" is made up of several groups often representing opposing interests remains the source of a constant challenge. It is thus not surprising that the OTA, the first case of a successful long-term institutionalization of the TA concept, not only has been a role model for many subsequent institutionalizations but also provides the first case of "de-institutionalization".

The recent history of parliamentary TA in Europe has seen the discontinuation of the Institute Society and Technology (IST) at the regional parliament of Flanders and the "rededication" of the Danish Board of Technology from a publicly funded body advising the Danish Parliament to a non-profit private foundation. It is of course impossible to come up with a universal explanation of the central causes of de-institutionalization. The little that is available in terms of analytical reasoning points, however, at a few critical factors. One obviously is holding, or failing to hold, the balance between opposing expectations of influential political factions. The fact that the OTA was always regarded with suspicion by the republicans as a "tool of the democrats" is regarded by many as at least a decisive factor that led to the closure of the OTA as soon as the republicans won the majority in both chambers of the US congress. And *Sadowski* and *Guston* (this issue) hold that the current "aggressive partisan divide" in the congress is not at all conducive to any new initiative to re-establish a non-partisan and scientifically independent body of policy advice. Being non-partisan and independent in the sense of not serving specific interests bears the risk of not making it into the news and having a low public profile. Reflecting on the reasons of the closure of the Flemish IST, its former director says in an interview: "… independence also means that nobody will defend you when you are in trouble" (Rabesandratana 2013). The lack of public profile and thus support (as a consequence of its formal ties to parliament) has also been addressed as a cause of the political "down grading" of the Danish Board of Technology (Horst 2014; see also *Delvenne et al.* this issue).

Another risk factor is most probably TA's hybrid character as a concept between science and policy making. In the case of IST, one decisive argument purported in parliamentary debates was that parliament is not there to fund research. In the words of IST's former director: "… there was a perception that research is nothing parliament should pay for, that what we did was somehow already done by researchers elsewhere" (Rabesandratana 2013). In the case of DBT, the argument of the ministry for cutting DBT's budget to zero was the need for reallocation of budgets for strategic research and that the DBT (although funded from the research ministry for decades) could not be regarded as doing research. Being neutral and independent and at the same time publicly visible, serving the needs of policy makers and at the same time having one foot in academia, taking a leading role in public S&T debates without taking a definite position in them are challenges ingrained in the concept of TA as an "honest knowledge broker" (Pielke 2007). This demands a lot of "balancing activities" which involve vulnerability – the more so when "hostile environments" search for "good reasons" for discontinuation.

4 "TA has Politics"

"Hostile environments" are often suspicious of a hidden anti-technocratic agenda held by TA. TA stands for a specific open, transparent, democratic, inclusive and "socially robust" mode of S&T policy making. The establishment of TA, as *Delvenne et al.* argue in this issue, is not only conducive to non-technocratic modes of R&D but is itself, as a concept, also tied to pushing the democratisation of S&T governance, thus not just taking a neutral position in R&D policy making. For Flanders and Wallonia, *Delvenne et al.* show that TA initiatives flourished in an era of a policy shift to "strategic science", i.e. a shift from isolated academic research to research that is socio-economically relevant. It was in this context of active R&D governance that initiatives of further opening the process of knowledge production and R&D decision making to a broad range of stakeholders successfully introduced TA into R&D governance debates. *Delvenne et al*. argue that "TA has politics" as it is aligned with a deliberative, open, democratic style of S&T governance and has often been primarily fostered and thus "naturally" promoted by policy makers with a left or green background. They argue that TA – in the course of being adopted as a neutral knowledge broker serving the needs of all fractions of parliament – loses its teeth, i.e. is no longer supportive of the goals associated with it by its advocates. This is a challenging argument that contradicts the discourse legitimizing TA that is usually heard in institutionalization debates – not surprisingly since institutionalization ideally needs the support of all sides, which is especially true in a parliamentary context with changing majorities. Does the institutionalization of TA as a central body providing policy advice on the national level (e.g. parliament) necessarily come at the price of being "tamed"? Our guess is that this question is by no means unfamiliar to TA practitioners involved in advising parliament, but the question may deserve to be dealt with more thoroughly and openly when reflecting on the opportunities, modes and risks of institutionalization.

5 National "TA Habitats"

We concluded from our research during the PACITA project on the conditions conducive for TA to evolve in countries where this has not yet been the case that the qualitative concept of what we called a "TA habitat" is important when thinking about introducing TA in a specific country (Hennen/Nierling 2014). The specific societal features of such a TA habitat provide room for further research but, drawn from the historical development of today's TA institutions, it seems that the process of institutionalization is highly dependent on a specific political context and the presence of political entrepreneurs pushing the idea of TA. The climate supportive of TA institutions thus seems to involve an interest by parliament, a scientific community trained and interested in interdisciplinary problem-oriented research, and a civil society eager to discuss and to raise their voice in issues of science and technology policy making. The country case studies discussed in this special issue also provide evidence of such features of national TA habitats. In some cases the authors of the articles even play a double role: a scientifically trained observer of institutional landscapes on the one hand, and a national political entrepreneur of TA on the other.

The contributions by *Böhle/Moniz* and *Delvenne et al.* both describe the long political negotiation processes which stand behind recent attempts and failings to institutionalize TA at either national or regional parliaments in Europe, where the smart use of "windows of opportunity" plays as important a role as the constant efforts of political and scientific actors to keep the idea of TA alive on the rapidly changing political agendas. They differ, however, when they analyse the specific function that TA has in the political environment. *Böhle/Moniz* still argue for the neutral function of TA as a means to "increase accountability and responsiveness of the political system regarding its innovation and environmental policies", which from their point of view can even serve as a first response to concerns citizens have expressed in Southern Europe. *Delvenne et al.* argue in contrast that the main motivation for an institutionalization of TA is deeply intertwined with the interest-driven push of regional science, technology and inno-

vation (STI) regimes to be the dominant climate characterising the Belgian TA habitat.

The contributions by *Leichteris* and *Sadowski*/*Guston* both are sceptical – although for very different reasons – of the sensibility of the long-held role of parliament as the best location for a national TA institution. The Lithuanian case stands for the difficulties which occurred in a recent exploratory process to ground modern forms of science-based policy making in Central and Eastern Europe where the centralist heritage of the Soviet Union is still prevalent. *Leichteris* concludes that the political climate is not yet ready for TA as far as politicians as well as governmental and science organizations are concerned. He thus proposes a transitional strategy of lobbying for and marketing of TA. The US case describes in contrast a habitat still supportive of TA where TA has until now been taken for granted. The supportive nature of this habitat is grounded in a range of organizations in the field of government, civil society and science even though it lost its prominent role in congress. The extent to which TA will be carried on in this distributed manner in the US in the future remains to be seen.

Both case studies furthermore allow us to shed a bit of light on the concept of "distributed TA" (*Sadowski/Guston*) – a term principally characterizing a lack or a flaw as it implies that TA is only a niche business. Can it also be understood as a strength when TA is distributed at decisive points in the R&I process – one could think of integrated or constructive TA early on in the R&I process? At least for specific national contexts, such a mode of institutionalization can be regarded as a prerequisite or a necessary step towards building more politically influential structures. In the case of Central and Eastern Europe (*Leichteris*) as well as in the context of international development (*Ely et al.*), the network model can be regarded as a step forward.

6 Future Outlook: TA on an International Level

How can we think of the future of institutionalization? Following the previously successful attempts of Western European institutions, can we still think of fixed pathways? The experiences of de-institutionalization (Denmark, Flanders, US) as well as the forward looking contributions in this special issue show that there are still followers of the "traditional Western model of TA" (see *van Est et al.*, *Böhle/Moniz* and *Delvenne et al.*) on the one hand, but also a range of modified pathways towards the future (*Leichteris* and *Sadowski/Guston*) on the other. It becomes obvious that the concept of TA as well as its forms of institutionalization need to be flexible and open to adapt to different political and social surroundings while still reflecting its specific heritage.

Although TA as a means of providing policy advice has *per se* a strong focus on the national context, it does not appear to be reasonable or even possible anymore to limit TA to national borders. Not least the European Union – an important actor for funding research as well as for cross-border exchange and learning – has also triggered institutionalization processes in certain countries, as with the PACITA project, which can be understood as a recent "re-energizer" of TA institutionalization (see *van Est et al.*). Without doubt, the role of the EU is a difficult one here: funding projects for a limited time span leaves the cooperation and the processes started in an open status, where stabilization and continuity would be preferable. The contribution by *Peissl/Barland* addresses the challenges that such a European perspective poses to TA. Thinking in a "Cross-European TA" perspective about TA pits benefits against its drawbacks: great opportunities for collaboration and mutual learning as well as a stronger position of the TA community through networks like EPTA versus a lack of structural funding from the EU; thus a strong dependence on the national context while at the same time facing the difficulties of European cooperation when attempting to transfer national results. Notwithstanding these difficulties, the European or even international perspective on TA will gain even more weight in the future.

The contribution by *Ely et al.* opens such a truly international perspective by presenting how TA can be employed by non-governmental organisations in developing countries. The idea which this perspective strengthens is the "broadening out and opening up" not only of the concept of TA but also of the actors and institutions involved in TA to international organizations,

such as the UN or OECD but also to globally operating NGOs. What we can learn from the international exercise *Ely et al.* present is the need for TA to stay flexible and open in order for it to be fruitfully employed in various contexts, but also the need to be clear about the limits and frame of the TA concept and of the institutions which can be named TA institutions.

Notes

1) PACITA (FP7, 2011–2015) is a four-year research and action plan, funded by the European Commission Framework Program 7, under Theme SiS-2010-1.0.1 Mobilisation and Mutual Learning Actions.
2) For a history of OTA and an analysis of the reasons for its closure in 1996 after a major change form a democratic to a republican majority in congress, see Herdman/Jensen 1997; Hill 1997.

References

Decker, M.; Ladikas, M. (eds.), 2004: Bridges Between Science, Society and Policy. Technology Assessment – Methods and Impacts. Berlin

Delvenne, P., 2011: Science, Technologie et Innovation sur le Chemin de la Réflexivité. Enjeux et Dynamiques du Technology Assessment Parlementaire. Academia-L'Harmattan: Louvain-La-Neuve, Belgium

Enzing, C.; Deuten, J.; Rijnders-Nagle, M. et al., 2012: Technology Across Borders. Exploring Perspectives for pan-European Parliamentary Technology Assessment. Brussels

Ezrahi, Y., 1990: The Descent of Icarus: Science and the Transformation of Contemporary Democracy. Cambridge, MA

Ganzevles, J.; van Est, R. (eds.), 2012: TA Practices in Europe. Deliverable 2.2. PACITA Project, European Commission. Brussels

Guston, D.H.; Bimber, B., 2000: Technology Assessment for the New Century. New Brunswick, NJ

Hennen, L.; Ladikas, M., 2009: Embedding Society in European Science and Technology Policy Advice. In: Ladikas, M. (ed.): Embedding Society in Science and Technology policy. European and Chinese Perspectives. Brussels, pp. 39–64

Hennen, L.; Nierling, L., 2014: A Next Wave of Technology Assessment? Barriers and Opportunities for Establishing TA in Seven European Countries. In: Science and Public Policy 41/3 (2014), pp. 1–15

Herdman, R.C.; Jensen, J.J., 1997: The OTA Story: The Agency Perspective. In: Technological Forecasting and Social Change 54 (1997), pp. 131–143

Hill, Ch.T., 1997: The Congressional Office of Technology Assessment. A Retrospective and Prospects for the Post-OTA World. In: Technological Forecasting and Social Change 54 (1997), pp. 191–198

Horst, M., 2014: On the Weakness of Strong Ties. In: Public Understanding of Science 23 (2014), pp. 43–47

Pielke, R., 2007: The Honest Broker: Making Sense of Science in Policy and Politics. Cambridge

Rabesandratana, T., 2013: A Quiet Death. Interview with Robby Berloznik on the closure of IST. In: Research Europe 24 (2013), p. 6

Radkau, J., 1989: Technik in Deutschland – Vom 18. Jahrhundert bis zur Gegenwart. Frankfurt a. M.

Rip, A., 2012: Futures of Technology Assessment. In: Decker, M.; Grunwald, A.; Knapp, M. (eds.): Der Systemblick auf Innovation. Technikfolgenabschätzung in der Technikgestaltung. Berlin, pp. 29–39

Vig, N.J.; Paschen, H., 2000a: Introduction: Technology Assessment in Comparative Perspective. In: Vig, N.J.; Paschen, H. (eds.): Parliaments and Technology. The Development of Technology Assessment in Europe. New York, pp. 3–35

Vig, N.J.; Paschen, H., 2000b: Parliaments and Technology. The Development of Technology Assessment in Europe. New York

Contact

Dr. Leonhard Hennen
Institute for Technology Assessment and Systems Analysis (ITAS)
Karlsruhe Institute of Technology (KIT)
Karlstraße 11, 76133 Karlsruhe, Germany
Phone: +49 228 30818-34
Email: leonhard.hennen@kit.edu

« »

Modeling Parliamentary Technology Assessment in Relational Terms

Mediating Between the Spheres of Parliament, Government, Science and Technology, and Society

by Rinie van Est, Rathenau Instituut, The Hague, Jurgen Ganzevles, Radboud University Nijmegen, and Michael Nentwich, ITA Vienna

This article describes parliamentary technology assessment (PTA) in relational terms.[1] We conceptualize PTA as fulfilling a mediating function between the spheres of parliament, government, science and technology, and society. This mediation is thought to take place through a set of interaction mechanisms on the institutional, organizational and/or project level that enable and constrain the involvement of actors from the above-mentioned four social spheres in shaping the practice of PTA. This enables us to model, map, and analyze how PTA in various European countries and regions is set up to interact with members of parliament, government, science and technology, and society. We found that the possible relationships between the PTA organization and each of the four social spheres have to be analyzed and carefully designed when thinking about setting up PTA. Countries with an interest in setting up PTA are not restricted to existing institutional models, but may create a model that is particularly suited to their own political and societal environment.

1 Introduction

Parliamentary technology assessment (PTA) is "technology assessment specially aimed at informing and contributing to opinion formation of the members of parliament as clients of the TA activity" (Enzing et al. 2011, p. i). Institutionalization, methodology and impact have been major themes in the debates around PTA ever since PTA was envisioned in the US during the 1960s (Vig/Paschen 1999; see Sadowski/Guston in this volume). Over the last few years, in particular the EU-funded PACITA project has re-energized the debate on the institutionalization, re- and de-institutionalization PTA.[2]

PTA practitioners within the PACITA project felt the need to develop a more inclusive way of modeling PTA since the ways the literature characterizes PTA focus too strongly on the relationship between the PTA organization and the parliament (cf. Ganzevles et al. 2014). The inclusive modeling[3] presented in this article does *not* take interaction with the parliament *a priori* as the main determinant of a PTA organization. PTA is modeled more broadly as a mediating function between the spheres of parliament, government, science and technology, and society.[4] We suggest that this mediation takes place through a set of interaction mechanisms that include institutional, organizational and project dimensions. This inclusive modeling fits well with the existing pluralistic PTA landscape. It also helps to deconstruct in a more transparent way these diverse practices by laying bare the many political, strategic, and practical choices involved in institutionalizing, organizing, and performing PTA.

In the PACITA project, conceptualizing and studying PTA were organized in an iterative manner. First an initial conceptualization of PTA was made. Moreover, an initial set of interaction mechanisms, which forms the basis how we model PTA, was identified. Based on this, a checklist was set up to guide the in-depth description and analysis of several existing practices of PTA in Europe. In particular, PTA was investigated in Austria, Catalonia (Spain), Denmark[5], Flanders[6] (Belgium), Germany, the Netherlands, Norway, and Switzerland. These case studies were used to refine our conceptualization of PTA and complete the set of interaction mechanisms. Finally, TA practitioners working at a certain PTA institute and researchers from a European country without a PTA institute were asked to use this information to model the various PTA practices studied in the PACITA project. At our request, the PTA organizations in France, the UK, the European Parliament, and Finland have also characterized their institutes in order to extend the comparative analysis. Accordingly, we have included twelve PTA institutes in our comparative analysis, of which all, except for Flanders, are current members of the European Parliamentary Technology Assessment (EPTA)

network. Greece, Italy, and Sweden are the only members of the EPTA network not included. Our analysis therefore gave a rather complete picture of the institutional PTA landscape in Europe.

This paper describes how PTA was conceptualized within the PACITA project (section 2), how the inclusive modeling of PTA, based on the identification of nine interaction mechanisms, looks (section 3), and how this model can be applied to existing PTA organizations (section 4). At the end of this paper we draw some conclusions and discuss further interesting lines of research.

2 Conceptualizing Parliamentary TA in Relational Terms

> "In explaining what an expert is, one can either refer to the particular knowledge people have, or to the position they occupy in a social network." van Rijswoud 2012, p. 18

In clarifying what PTA is, one may describe its institutional position in both informational and relational terms. According to the informational perspective, the position of the PTA community depends on the particular knowledge it generates, i.e., knowledge about the societal aspects of science and technology. According to the relational approach, its position is due to the existence of a clientele. In practice, the informational and relational aspects go hand in glove since the exchange of information needs to be organized and seen as legitimate. Accordingly, PTA in the PACITA project is framed as a science-based practice of information production on science, technology, and social matters. Moreover, PTA is also regarded as a social activity where practitioners try to have an impact on their clients by building up relations of knowledge sharing and trust among actors from various societal spheres. Understanding PTA in relational terms implies taking into account the position PTA occupies in a social network and acknowledging that the various bonds enable and constrain the activities and impact of a PTA organization.

Connecting to Four Social Spheres

Most of the literature characterizing PTA (cf. Falkner et al. 1994; Hennen/Ladikas 2009; Cruz-Castro/Sanz-Menéndez 2005; Enzing et al. 2011) has focused on the question of to what extent each PTA organization has been put within or outside parliament (Ganzevles et al. 2014). By definition, parliament is an important player within the social network of PTA organizations. PTA organizations are democratically entrusted to build connections with MPs or even directly access and inform them. We felt the need to abandon the view that one single logic – the relationship to parliament – is shaping PTA. Our modeling efforts build, in contrast, on the common knowledge that PTA institutes are shaped by more institutional linkages. For example, it is known that PTA plays an intermediary role between the parliament and the science and technology sphere. Moreover, a PTA organization can also have the institutional task to both inform the political and the societal debate, implying that developing bonds with societal actors may be relevant for PTA institutes. Finally, in the European political context, governments often also play an important role in the social network of PTA organizations, for example, as a client or a sponsor of a PTA organization. Thus, we modeled PTA to operate in a complex institutional landscape that consists of four social spheres: parliament, government, society, and science and technology.

Three Levels of Interaction

PTA practitioners like to frame their practice in both informational and relational terms (see above), as they broadly define TA as "a scientific, interactive and communicative process, which aims to contribute to the formation of public and political opinion on societal aspects of science and technology" (Bütschi et al. 2004, p. 14). This definition, however, basically refers to the practice of performing PTA. We would like to go beyond this definition and study the linkages between PTA and the four distinguished social spheres on three (interconnected) levels: the institutional, organizational, and project levels.

The macro, or institutional, level, concerns the political support for a TA organization for which parliament is (one of its) main (formal) clients; it is also about the way PTA is legitimized and framed as an institutional solution for the gov-

ernance of – often societally controversial – developments in science and technology. The meso, or organizational, level concerns the politics of shaping and controlling the TA organization that has the task to perform PTA. Finally, the micro, or project, level refers to doing PTA. Issues at this level are: how to frame a certain topic, what kinds of methods to choose, and how to communicate the results of your TA project to parliament and to other relevant clients. The ultimate aim is to contribute to the democratic quality of the (public and political) debate on science and technology. As indicated above, these levels are interrelated.

The way in which PTA is institutionalized enables the related TA organization to have an impact. Enabling may refer to being provided with the proper resources and the institutional task to participate in the political decision-making process and thus to influence the democratic process. Simultaneously, that same institutional context will constrain the way in which that TA organization may perform its activities. As Cruz-Castro and Sanz-Menéndez (2005, p. 446) provocatively conclude: "Some of the best adaptation strategies that Parliamentary Offices of Technology Assessment use to improve their chances of survival clash structurally with the desire to increase the direct impact of their TA activities on policy-making activities." For example, while building coalitions and aligning with the political majority in Parliament may be a quick way to enhance impact, in the long term "a new majority can make one pay for institutional disloyalties". The way in which a PTA organization is institutionalized thus both enables and constrains how a PTA institute can operate within the complex landscape that consists of the four social spheres identified above.

3 Modeling PTA by Means of Nine Interaction Mechanisms

Our modeling of PTA in relational terms is founded on the notion of interaction mechanisms, loosely defined as procedures or routines on the institutional, organizational, and project level for enabling and constraining the involvement of actors from the above-mentioned four social spheres in shaping the practice of PTA. We discern nine interaction mechanisms: client, funding, evaluation committee, board, working program, project staff, project team, participatory methods, and project revising and/or reviewing. We use the various countries and regions studied in the PACITA project to illustrate how these nine mechanisms play out in different ways in the practice of PTA in Europe.

The *client* of an organization has a major impact on how PTA is set up and how its work processes are structured. PTA organizations in France (OPECST) and Germany (TAB) and on the European level (STOA) focus on parliament. The PTA organization in Catalonia works for parliament and society. Until it was abolished in 2012, the former PTA organization in Flanders, IST, also had both the parliament and society as clients.[7] We see a combination of parliament, government, and society as clients in Denmark, the Netherlands, Norway, and Switzerland. In Austria the science community is an explicit client.

Funding may involve long-term basic funding schemes, but also short-term sponsorships on a project level. Exclusive parliamentary funding exists, for instance, for the European Parliament (STOA) and in France (OPECST), Germany (TAB), and the United Kingdom (POST). In Catalonia (CAPCIT) there is sponsorship from the science and technology community. In Austria (ITA), the Netherlands (Rathenau Institute) and Switzerland (TA-SWISS), the funding scheme is related to both the governmental and the scientific spheres. We encounter a more dispersed funding pattern in Denmark (from 2012) and Flanders (until 2012), where parliament, science, and society are involved.

The *evaluation committee* or *group* refers to the task of examining and reporting on the functioning of the organization as a whole. An evaluation committee may be installed by the government (as happens in the Netherlands every five years and happened in Norway in 2011), by the organization's "own" steering committee or board (as happens in Switzerland), or by an evaluation board set up by the mother institution (like the Austrian Academy of Sciences does for ITA). The Danish Board of Technology has a board of representatives that takes an evaluative stance in annual report meetings. Representatives from differ-

ent societal spheres are involved in the evaluation procedures of the above organizations. In the evaluation of PTA organizations working close to parliament (like STOA, IST, and TAB), parliamentarians have a relatively strong say in formal evaluations by the organization. In the UK (POST), Catalonia (CAPCIT), and France (OPECST), no formal evaluation procedures exist.

Most of the organizations have a *board, committee, panel*, or *platform* that has regular interactions (typically every two or three months) with members of the management team that is in charge of performing daily TA activities. For STOA and TAB this entity consists of parliamentarians only. In France (OPECST), it is the parliamentarians themselves who perform TA, and their staff has an auxiliary function. In Austria (ITA), the board consists solely of representatives of science, and the Steering Committee in Switzerland (TA-SWISS) is also strongly linked to the scientific community. In Flanders (IST) and Catalonia (CAPCIT), the board or panel, respectively, is equally divided between parliamentarians and representatives from the science and technology community. More dispersed patterns of involvement of different spheres exist in other organizations.

Most of the organizations have an annual, bi- or tri-annual *working program*. Establishing such a program is a parliamentarian task for the European Parliament, carried out by the STOA panel, which takes into account requests from both parliamentary committees and individual members. In Germany (TAB), this responsibility is shared between politicians and the scientists from the TA office. At other organizations, we see a stronger involvement from society and government. Draft programs are often discussed with people from outside the institute. Catalonia (CAPCIT) does not work on the basis of a working program, but priorities are set periodically at each platform meeting.

The four remaining interaction mechanisms all play out on the project level. We use the word *staff* to refer to the people who are in charge of the TA projects. In principle, these practitioners may have ties to any of the four societal spheres: parliament, government, science, and society. In practice, staff at most of the organizations is mainly based in science. The inclusion of more communication and (project) management skills in the organizations accounts for the involvement of the societal sphere in Denmark, Flanders, the Netherlands, Switzerland, and Norway. Only in France do parliamentarians themselves carry out this task (although with staff support). Since the TA staff may outsource part of the work, the *project team* is another relevant mechanism for involving different social spheres within the project. The same counts for *project participation methods* and mechanisms for *project advising and/or reviewing*. The latter may consist of scientific peers or stakeholders reviewing draft texts. By contrast, in Norway (NBT) heavy involvement of experts and stakeholders throughout the complete project is the normal case.

4 Applying the Modeling to Existing PTA Organizations

As indicated in the introduction, the PACITA project investigated PTA in depth in Austria, Catalonia, Denmark, Flanders, Germany, the Netherlands, Norway, and Switzerland. For each country or region, the research was done by a mixed team, which consisted of TA practitioners that worked at the PTA institute under scrutiny and researchers from a European country without a PTA institute; these latter researchers worked at organizations that took part in the PACITA consortium.

Each team carried out several semistructured expert interviews with relevant stakeholders, such as MPs and the director of the TA unit. In addition, the teams used institutional archives, websites, and earlier descriptions in the literature of the respective institutions to compile up-to-date descriptions and analyses. The reports on all the countries follow the same set-up, clarifying the institutionalization and organization of PTA in these countries. Furthermore, an in-depth case study of one TA project was included per organization in order to illustrate the 'nuts and bolts' of daily practice.

In order to characterize the various PTA organizations from a relational perspective, the teams were asked to fill in a matrix spanned up by the nine interaction mechanisms and the four spheres: parliament, government, science and

technology, society. In this way the teams had to indicate to what extent the nine interaction mechanisms enabled and constrained the involvement of actors from the four social spheres. The teams had to express the involvement of the various spheres in shaping the practice of PTA in percentages. For each mechanism, the total involvement of the four spheres should add up to a hundred percent. To determine the overall involvement of each of the spheres, the PACITA task team decided to consider each of the nine interaction mechanisms as equally important. In this way, based on the results of the in-depth qualitative research of the various PTA organizations, a semiquantitative description of those PTA organizations was constructed. This strongly facilitated the comparative analysis of the PTA institutes studied. Moreover, this mixed qualitative and quantitative approach enables us to create a graphical representation of each PTA organization. See Figure 1, in which the width of each arrow represents the strength of the involvement of each sphere.

The graphical representations of the PTA organizations from France, the United Kingdom, the European Parliament and Finland can also be found in Figure 1. These PTA organizations were not part of the PACITA project and were not studied in detail. Nevertheless, these countries were included in the concluding chapter of the report, extending the comparative analysis made there to provide a more complete picture of the PTA landscape in Europe (Ganzevles/van Est 2012). Upon our request, the PTA organizations in France and the UK and at the European Parliament filled out the same table, also recording their scores (Ganzevles/van Est 2012). In order to increase the objectivity of the process, country/region reports, common tables, scores, and mappings were sent out to all the PACITA partners for feedback. Finland was added later as an extra case (Ganzevles et al. 2014) and was not part of these feedback loops.

In theory, eight different organizational models for PTA[8] can be distinguished. The mapping process in the PACITA project identified four distinct PTA models that are currently operational in practice: mainly parliamentary involvement, shared parliamentary-science involvement, shared parliamentary-science-society involvement, and shared parliamentary-government-science-society involvement (see Fig. 1).[9] Besides these four PTA models, the TA model of shared science-government involvement was found in Austria.

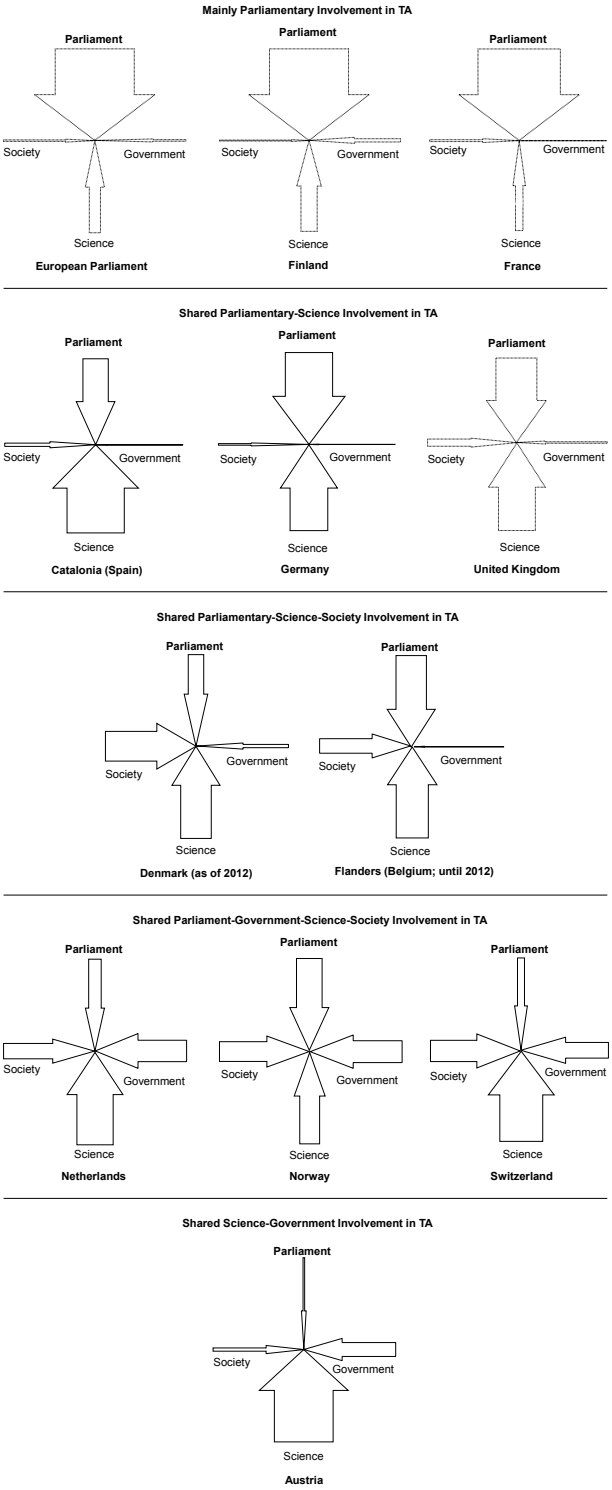
Mainly Parliamentary Involvement in TA

PTA in France and Finland and at the European Parliament is dominated by the involvement of parliament in the practice of TA. OPECST shows a near maximum level of involvement by MPs, even on the project level, where members of OPECST are responsible for writing the TA report (Enzing et al. 2011). In Finland, it is mainly scientific experts who contribute to PTA projects. Moreover, the Committee of the Future is in a constant dialogue with the government, although the government has no formal say regarding its working program. The STOA panel of the European Parliament works with procurement procedures that are embedded in a framework contract, for which scientific consortia, experienced in TA, can apply on a project-to-project basis (Delvenne et al. 2011).

Shared Parliamentary-Science Involvement in TA

Like in France, the German Parliament is strongly involved in the practice of TA. There is, however, one crucial difference between the German and French situation: the actual TA research is performed by researchers within TAB – an office that works closely with but is outside parliament – and, to a considerable extent, by outside contractors. The German model for organizing TA presents a form of "shared parliament-science involvement in TA", in which, however, the parliament has a strong voice and the final say. The Advisory Board of the Parliament of Catalonia for Science and Technology (CAPCIT) is attached to the regional parliament, but as a mixed body: half of its eighteen members are MPs and the other half scientists. Moreover, the scientific community sponsors and performs the TA activities. In the case of POST (UK), a scientific unit is placed directly inside parliament, and works in close contact with MPs.

Fig. 1: Overview of (parliamentary) TA models found in the PACITA project



(P)TA is illustrated as a mediating function between the spheres of parliament, government, science and technology, and society. The width of each arrow represents the strength of the involvement of each of the four social spheres. For reasons of convenience, "Science" was used as shorthand for "Science and Technology". The thin lines indicate that these cases have not been studied comprehensively in the PACITA report (Ganzevles/van Est 2012).

Source: Ganzevles et al. 2014

Shared Parliamentary-Science-Society Involvement in TA

Half of the board of IST (Flanders) consisted of MPs, and the other half of scientists. In addition to parliament, the wider public was a formal client of IST in Flanders. IST put a lot of effort into stimulating public debate, by means of participatory methods, technology festivals, and communication. Typifying PTA in Flanders (until 2012) as a form of "shared parliamentary-science-society in TA" does justice to the fact that IST had strong links with parliament, with science, and with society. Although the foundational structure of the Danish Board of Technology (DBT), as installed in 2012, differs significantly from that of the Flemish situation, the four spheres exert a similar amount of relative influence on it. It has strong ties with the social sphere, in particular via its participatory procedures.

Shared Parliament-Government-Science-Society Involvement in TA

Active MPs do not participate in the boards of PTA organizations in the Netherlands, Norway, and Switzerland. In its role as client, however, parliament exerts an indirect, but crucial, influence on the way the TA organizations in these countries function. In these countries, the government and wider society are also included as formal addressees. Moreover, government plays a role in funding the TA organizations. Accordingly, we refer to this model of organizing TA in the Netherlands, Norway, and Switzerland as "shared parliament-governmental-science-society control".

Shared Government-Science Involvement in TA

In addition to these four PTA models, another TA model was identified in Austria, namely "shared government-science involvement in TA". ITA in Austria has very strong ties with science. This involvement is mainly shared with the government (both in Austria and at the EU level), which is one of the clients and the most important sponsor. More recently, parliament has shown increased interest in TA. Via participatory methods, ITA has also strengthened the involvement of society in its projects. A gradual shift towards model 4 can be detected.

5 Scrutinizing PTA in a New Way

In this article we model PTA in relational terms. The existing literature typically focuses on the formal institutional and organizational relationship to parliament as being the main determinant for classifying a specific PTA organization. In addition to its connections with parliament, the approach as developed within the PACITA project also takes into account interactions between the PTA organization and three other social spheres, namely government, science and technology, and society. Moreover, it makes it possible to study this relationship on three levels (institutional, organizational, project) in an empirically transparent fashion by distinguishing nine interaction mechanisms, which are procedures that enable and/or constrain the ways in which PTA organizations may shape their interactions with the four spheres.

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 to which they interact (on both the institutional, organizational, and project level) with the four distinct social spheres. Out of the eight theoretically conceivable interaction models, four distinct interaction models for PTA are currently operational in Europe. Thus when policy makers and politicians discuss the creation of a new PTA institution or the future of an existing one, they are advised not only to discuss its preferred relationship to parliament, but also with government, science and technology, and society. To make things even more complex, thinking about the interaction between PTA and the four spheres should be done on the institutional, organizational, and project levels.

This may sound like common sense and mirroring the existing practice, but that is surely not the case. As already mentioned, the existing literature mainly focuses on the relationship of the PTA institution with parliament. There is even such a bias within EPTA (the European Parliamentary Technology Assessment network). More specifically, most attention is paid to the institutional and

organizational dimensions of this relationship. Except for the country reports of the PACITA project (Ganzevles/van Est 2012), the project level – the practical level that finally decides whether PTA has an impact on parliamentary debate and decision making or not – is rarely touched upon. In contrast, with respect to the relationship between PTA and society, most of the academic work and debates deal with participatory methods, that is, they focus on the project level (cf. Slocum 2003), leaving implicit how such participatory methods should be embedded in organizational and institutional structures. Finally, although there is a lot of literature that deals with the role that scientific advice plays in policy making, reflection on the interaction between PTA and the spheres of science and technology and even more so that of government is almost nonexistent.

In this way, defining PTA in relational terms opens up a new research agenda with respect to the practice of PTA and TA in general. The PACITA project partly addressed this new agenda by using case studies to describe, basically for the first time, how in practice PTA organizations try to connect to the various spheres to achieve an impact (Ganzevles/van Est 2012). Other relevant research questions are: By whom and how is interaction between PTA and the various social spheres debated and shaped on the various levels? How do the actions on a certain level influence activities on another level? If (participatory) TA methods developed at the national level are used on the European political level, to what extent do they require well-developed relationships between PTA and the political system on an institutional and organizational level?

When we return to the issue of institutionalizing PTA, our modeling of PTA in relational terms can be used to map the institutional development of PTA over time. Appreciating the dynamics of PTA on the institutional level is crucial for the future of PTA, with regards to creating new institutions and maintaining existing institutions or to adapting them to new political demands. The case studies show that a long-term perspective is needed to come to grips with that process. For example, the national political debate about setting up PTA was found to take a long time; often more than a decade. Moreover, existing institutes may radically or gradually change their institutional position. We saw for example that, as the Austrian parliament is knitting closer ties with the TA and foresight communities and participatory procedures are gaining importance in ITA's work, Austria is drifting away from "shared science-government involvement in TA" towards model 4 (shared parliament-government-science-society involvement in TA).

When we take a long term perspective, we see that PTA organizations show institutional flexibility and adaptability. They drift, so to speak, through a so-called "institutional possibility space" that consists of fifteen models. There is even the possibility that they might drift out of that space, as in Flanders where PTA ceased to exist on January 1, 2013. Countries with an interest in PTA or which already have PTA capacity should try to find the model that is particularly suited to their (evolving) context. The "possibility space" that is chosen will provide ample opportunities for adapting to changing political demands (Hennen/Nierling 2014). Both abrupt and gradual changes are possible, and many development scenarios are imaginable. For example, a country may first set up a PTA organization that focuses on its relationship with parliament and later on develop its relationship with society. Or it may first establish a good relationship with government and science and technology, and only later gradually develop a stronger relationship with parliament.

We may conclude that the way we have modeled PTA in relational terms proved useful to describe, characterize, and acknowledge the diverse nature of the various PTA arrangements in Europe. It also clarifies the diverse challenges involved in setting up and maintaining PTA organizations. We hope that defining PTA in relational terms opens up a new manner of understanding and questioning PTA and its role and impact in the way modern society deals with science and technology.

Notes

1) This article is based on research done within the EU-FP7 project PACITA (Ganzevles/van Est 2012) and an article which compares our way of modeling parliamentary technology assessment (PTA) with the existing literature (Ganzevles et al. 2014). The

present article wants to stress the political relevance of this approach, as formulated in the PACITA policy brief "Multiple faces of (parliamentary) technology assessment institutions" (PACITA 2014).

2) This paper is based on the results of task 2.1. "TA practices in Europe" of the European Commission funded PACITA project (Ganzevles/van Est 2012; Ganzevles et al. 2014; PACITA 2014). PACITA stands for Parliaments and Civil Society in Technology Assessment. The project's aim is to stimulate reflexivity on PTA in European regions and countries with and without established PTA organizations.
3) In the literature on PTA, the word "model," e.g., the OTA model, is regularly used to characterize certain "practices of involvement among experts, policy makers and the public" (Bimber, Guston 1997, p. 130), which van Eijndhoven (1997) names TA paradigms. Our ambition is bigger. We want to make explicit how PTA practices on the institutional, organizational and project level are characterized by their bonds with four social spheres: parliament, government, science and technology, and society. As a result, eight PTA models can be distinguished (see note 8). The PTA model that characterizes a certain PTA institute can be determined using a set of nine specific interaction mechanisms (see section 3).
4) In this context, the sphere of "society" is used as an umbrella term for the spheres comprising citizens, nongovernmental organizations, and the media. Businesses may play a role in the spheres of science and technology and of society.
5) Note that the institutional arrangement of the Danish Board of Technology changed when it was newly installed in 2012. In the PACITA project this new foundational structure is taken into account.
6) Note that at present there is no TA institution in Flanders. The former PTA organization in Flanders, named IST, was abolished January 1, 2013. The institutional arrangement before that date was described in the PACITA project.
7) Currently there is no TA institution in Flanders. In the French part of Belgium, Wallonia, a law is under consideration that would install a TA organization by 2015 (see Delvenne et al. in this volume).
8) Since PTA, by definition, is TA specially aimed at the Parliament, eight models of PTA can be distinguished: mainly parliament involvement, shared parliament-government involvement, shared parliament-science involvement, shared parliament-society involvement, shared parliament-government-science involvement, shared parliament-government-society involvement, shared parliament-science-society involvement, and shared parliament-government-science-society involvement. If one would look for models of TA in general one would find an additional seven models, including for example mainly government involvement, mainly science involvement, mainly society involvement or shared government-science involvement. In total fifteen models of (P)TA theoretically exist.
9) Given the fact that there are eight potential models of PTA, the following four PTA models were not identified in the PACITA project: shared parliament-government involvement, shared parliament-society involvement, shared parliament-government-science involvement, and shared parliament-government-society involvement.

References

Bimber, B.; Guston, D.H., 1997: Introduction: The End of OTA and the Future of Technology Assessment. In: Technological Forecasting and Social Change 54 (1997), pp. 125–130

Bütschi, D.; Carius, R.; Decker, M. et al., 2004: The Practice of TA; Science, Interaction and Communication. In: Decker, M.; Ladikas, M. (eds.): Bridges Between Science, Society and Policy: Technology Assessment – Methods and Impact. Berlin

Cruz-Castro, L.; Sanz-Menéndez, L., 2005: Politics and Institutions: European Parliamentary Technology Assessment. In: Technological Forecasting & Social Change 72 (2005), pp. 429–448

Delvenne, P.; Fallon, C.; Brunet, S., 2011: Parliamentary Technology Assessment Institutions as Indications of Reflexive Modernization. In: Technology in Society 33 (2011), pp. 36–43

Enzing, C.; Deuten, J.; Rijnders-Nagle, M. et al., 2011: Technology Across Borders: Exploring Perspective for Pan-European Parliamentary Technology Assessment. Brussels

Falkner, G.; Peissl, W.; Torgersen, H., 1994: PTA in Europa: Der Vergleich. In: Falkner, G.; Peissl, W.; Torgersen, H. (eds.): Technikfolgen-Abschätzung in Europa. Forschungsstelle für Technikbewertung, Vienna, pp. 166–193; http://epub.oeaw.ac.at/ita/ita-projektberichte/d2-2e03.pdf (download 18.12.14)

Ganzevles, J.; van Est, R. (eds.), 2012: TA Practices in Europe. PACITA, Deliverable 2.2; http://www.pacitaproject.eu/wp-content/uploads/2013/01/TA-Practices-in-Europe-final.pdf (download 11.12.14)

Ganzevles, J.; van Est, R.; Nentwich, M., 2014: Embracing Variety: Introducing the Inclusive Modelling of (Parliamentary) Technology Assessment. In: Journal of Responsible Innovation 1/3 (2014), pp. 292–313

Hennen, L.; Ladikas, M., 2009: Embedding Society in European Science and Technology Policy Advice. In: Ladikas, M. (ed.): Embedding Society in Science and Technology Policy – European and Chinese Perspectives. Brussels, pp. 39–64

Hennen, L.; Nierling, L., 2014: A Next Wave of Technology Assessment? Barriers and Opportunities for Establishing TA in Seven European Countries. In: Science and Public Policy 41/3 (2014), pp. 1–15

PACITA – Parliaments and Civil Society in Technology Assessment, 2014: Multiple Faces of (Parliamentary) Technology Assessment Institutions. Policy Brief drafted for the Second PACITA Parliamentary Debate, "Strengthening Technology Assessment for Policy-Making", April 7–8, 2014 in Lisbon in the Portuguese Parliament; http://www.pacitaproject.eu/wp-content/uploads/2014/08/20140311_Information-material-for-participants.pdf (download 18.12.14)

Slocum, N., 2003: Participatory Methods Toolkit: A practitioner's Manual. Brussels

van Eijndhoven, J.C.M., 1997: Technology Assessment: Product or Process? In: Technological Forecasting and Social Change 54/2 (1997), pp. 269–286

van Rijswoud, E., 2012: Public Faces of Science. Experts and Identity Work in the Boundary Zone of Science, Policy and Public Debate. Enschede

Vig, N.J.; Paschen H., 1999: Parliaments and Technology. The Development of Technology Assessment in Europe. New York

Contact

Dr. ir. Rinie van Est
Rathenau Instituut
P.O. Box 95366, 2509 CJ The Hague,
The Netherlands
Email: q.vanest@rathenau.nl

« »

De- and Re-Institutionalizing Technology Assessment in Contemporary Knowledge-Based Economies

A Side-by-Side Review of Flemish and Walloon Technology Assessment

by Pierre Delvenne, Nathan Charlier, Benedikt Rosskamp and Michiel van Oudheusden, SPIRAL Research Centre, Belgium

This article illuminates the potential role of technology assessment (TA) in knowledge-driven science, technology and innovation (STI) regimes by providing a comparative review of Flemish and Walloon TA. It draws critical attention to the ways in which TA actors and institutes in Flanders and Wallonia position themselves, or are positioned, in relation to dominant innovation policies and large-scale political transformations, notably the convergence of STI around the knowledge-based economy (KBE) and the regionalization of STI policy in Belgium. The article's findings shed light on the Flemish government's recent decision to close its parliamentary TA institute and the institutional expansion of TA in Wallonia and elsewhere in Europe. It argues that TA has politics, as TA in Flanders and Wallonia aligns with the advent of strategic science and is also affiliated to specific political parties. As these considerations run counter to the dominant representation of TA as a neutral governance tool that serves the needs of all STI decision makers, they draw into question the viability and utility of TA within contemporary KBEs.

1 Introduction

Today, industrialized nations and regions invest increasing amounts of public resources in science and technology. Flanders and Wallonia are no exception to this general trend. Originally unified with the regions of Brussels under a common Belgian government and administration, Flanders and Wallonia have developed their own science, technology, and innovation policies. While these policies serve Flemish and Walloon policymakers

and innovation actors (e.g. politicians, captains of industry, enterprises) as a lever for regional economic development and regional self-assertion (Delvenne 2011; Delvenne et al. 2013), they also increasingly converge around the global knowledge-based economy narrative. Accordingly, both regions presently structure their STI policies around the KBE principles of knowledge accumulation and market-driven innovation. In Flanders, this represents an effort to become a "leading innovation region" (VIA 2006) that can compete with the best innovation economies in the world, while in Wallonia a vision is projected of the region becoming "the architect of its own fate" (GW 2005, p. 3). As stated in the Walloon government's 2005 Marshall Plan,[1] "economic recovery should bear on innovation and industry-university partnership within a European Knowledge Society/ Economy" (GW 2005, p. 22).

Taking these local and global market-driven imperatives as its entry points, this article renders explicit how STI in Flanders and Wallonia is affected and, potentially, transformed by *technology assessment.* Broadly defined, TA encompasses activities and programs that extend and deepen the knowledge base of contemporary KBEs, often beyond purely economic and commercial interests (van Oudheusden et al. 2014). As we illustrate in this article, initial Flemish TA initiatives in the 1980s challenged technology-centric, market-led innovation policies for failing to consider the wider social, ecological, and ethical ramifications of technology. By deepening and broadening traditional, usually linear, views of innovation, Flemish TA has evolved with Flanders' transition to a knowledge-driven economy that seeks to be competitive *as well as* sustainable, inclusive, and democratic (VIA 2006).

Conversely, in Wallonia, due to the institutional fragmentation of STI competence across overlapping communal and regional substate entities, the absence of TA is linked to the belated emergence of a socioeconomic context that is conducive to knowledge-driven innovation.[2] Over the last fifteen years, however, STI policies have dramatically evolved and even become a cornerstone of Walloon regional policymaking. As we will see, these shifts were accompanied by a rise of interest in TA on behalf of Walloon governing bodies and policymakers.

To put these considerations in due empirical and comparative perspective, we retrace the emergence and evolution of Flemish and Walloon TA in connection with regional innovation policy. We draw on accounts provided to us by policy analysts and spokesmen, industry research leaders, trade unionists, civil servants, parliamentarians and academics very knowledgeable of regional, Belgian, and European innovation policy and TA, as well as information taken from the secondary literature on innovation policy and TA. We stress that this study does not fully map the policy debate on STI in Flanders and Wallonia. Rather, the emphasis is on TA actors and processes, and particularly on TA's institutional uptake and the potential impact on STI policymaking.

Our review brings a macrosociological and political sensitivity to bear on TA and STI processes. We suggest that TA processes both enact as well as counteract dominant STI policies and justifications, and typically do so at the intersection of sociotechnical spheres, policies, and temporalities. How TA communities position themselves or are positioned by innovation actors (e.g. politicians, industrialists, the media) in relation to dominant policy paradigms (e.g. responsible research and innovation and the KBE) is particularly relevant for consideration in view of the Flemish government's 2012 decision to close its parliamentary TA agency, the Institute for Society and Technology. It is also important in view of recent attempts to set up a Walloon parliamentary TA institute. Whereas the Flemish decision appears largely out of sync with the growth and development of TA activity across Europe,[3] it coincides with the recent transformation of the iconic Danish Board of Technology into a nonprofit trading foundation.

2 Technology Assessment in Belgium

Since the 1970s, constitutional reforms have gradually transformed Belgium from a unified state into a federal one with communities, regions, and language areas. The reforms were enacted as a means of finding constitutional and legal solutions for the problems between the country's Dutch and

French speaking communities. As a consequence of these reforms, the STI regime (Delvenne 2011; Fallon 2011) in Belgium came to be decentralized, based on a horizontal division of policy domains between the regions of Flanders (in the north), Wallonia (in the south), and the Brussels capital region (in the center). Each entity now pursues, develops, and implements its own STI policies, more or less independent from the federal state and from one another. For instance, in 2003, Flanders launched its *Innovation Pact*. In 2005, Wallonia launched its *Marshall Plan* (since 2009 known as *Marshall Plan 2. Vert)*, while Brussels initiated a *Regional Innovation Plan*.

The Roots of Flemish TA

Although Flanders is presently the economically richer region, it lagged behind Wallonia until the middle of the twentieth century. The region gradually became more prosperous than Wallonia after the Second World War, following the decline of Wallonia's "old" coal and iron industries (Halleux et al. 2009). When the first ever Flemish government came to power in the 1980s, it made attempts to boost Flemish economic self-awareness and position Flanders as an industrial, entrepreneurial and highly technological region (Oosterlynck 2006, p. 98). A determining figure in this transformation was the then chair of the Flemish government, Gaston Geens. Geens launched "DIRV", which stands for Derde Industriële Revolutie Vlaanderen, literally Third Industrial Revolution Flanders.

The program lent support to various "basic" and "applied" technologies, including the highly promising and already emanating fields of biotechnology, new materials, and microelectronics. Less perceptibly, but equally important, DIRV delivered a decisive break with economic pessimism in Flanders. It was a conspicuous campaign, which served the Flemish government as a means to present "a clear image of itself to the general public, with an offensive policy of its own, distinct from both Walloon policy and national policy" (Goorden 2004, p. 8).

Various authors and interviewees hence identify DIRV as a "keystone" not just in instigating contemporary innovation policy in Flanders, but also acknowledge its role in contributing to a range of political-economic reforms that primarily emphasized entrepreneurship and restricted Keynesian state intervention in the economy. While these restructurings emerged in response to various international and domestic trends and challenges (e.g. the linguistic conflict in Belgium), they were also the result of ideological crafting and the search for new policy paradigms (Witte et al. 1997, p. 321). It is, partly at least, against this background that ensuing programs, actions, and controversies in the Flemish innovation context should be understood, including the emergence and development of TA.

As a program of large-scale reform, DIRV met with strong opposition from the political left, including the socialist trade union ABVV (representing traditional industries, among others). One of its most vocal critics in the Flemish parliament is the socialist Norbert De Batselier. These actors criticized DIRV for its strong emphasis on entrepreneurship and small government, and its neglect of social dimensions.

In response to these criticisms, Geens conceded to the demands of the trade unions to erect the Stichting Technologie Vlaanderen (STV), which officially translates into Flemish Foundation for Technology Assessment. As a government-financed agency led by the social partners[4] and embedded in the Social Economic Council of Flanders (SERV), STV's aim was to analyze the social dimensions of new technologies and advise the government on issues of science and technology (SERV 1994; SERV 1998; Goorden 1990). Shortly after STV's creation, the first TA initiatives were launched as academic research programs. Following Goorden (2004, p. 11), we label these initiatives *early-warning TA,* as they were charged with examining the social impact of new technologies such as biotechnology and microelectronics.

Two TA Initiatives in Wallonia

The emergence of Flemish TA did not go unnoticed in the south of Belgium. In the aftermath of DIRV, the then Walloon minister of Research and Technology, Melchior Wathelet (Christian Social Party, PSC), attempted to position Wallonia in re-

lation to Flemish innovation policy. While some Walloon labor representatives and social partners in the Walloon Economic and Social Council (CESRW) favored the erection of an institute like STV in their region, liberal and Christian-Democratic parties feared such an institute would reinforce the power of the social partners. Even so, in 1988 Melchior Wathelet proposed a study on the opportunity and feasibility of erecting a Walloon PTA institute. This study was delegated to the Research Center in Informatics and Law (CRID) at the University of Namur. The CRID team visited several TA institutions across the globe and recommended a TA model quite similar to that of the US Office of Technology Assessment, OTA. When it came to assessing this study, the CESRW pointed out that this proposition did not fit the Walloon context and the needs of potential users. In addition, it criticized the limited institutional approach and its disconnection to European evolution, especially the "participatory turn" in Denmark (Joss 1998) and the rise of constructive TA in the Netherlands (Schot/Rip 1997).

The second initiative to introduce TA came from Gérard Valenduc, then representative of the Christian trade union at the CESRW, and member of its research commission, the Walloon Council for Science Policy (CPS). In 1991, he obtained funding for a new exploratory project called Experiences of Mediation and Evaluation of Research and Technological Innovation (EMERIT) from the new minister in charge of New Technologies, Albert Liénard (also a Christian-Democrat). The idea behind EMERIT was to catch up with recent regional TA developments in other European regions (e.g., in Baden-Wurttemberg) and to develop TA activities based on concerted social measures. These objectives differed markedly from the original idea of supporting parliamentary decision making, centering instead on fostering the appropriate conditions for an innovation-friendly socioeconomic climate. Then, in 1994, following a conference within the EMERIT framework, Liénard announced his proposition to assign the CPS (nested within the CESRW) a TA mission. The CESRW accepted but some of its members remained suspicious about TA, an activity it had not been prepared for. After completing four studies, the CPS in 2002 decided to abort its TA mission, considering that it had not succeeded in attracting the attention of its main addressees, the Walloon parliament and government. In fact, the CPS never received any demands for formal TA from its addressees. Its most successful activities were those dedicated to the popularization of science, which were not tailored to meet their users' political needs and failed to move the social debate forward (Delvenne 2009).

Bottom-up and Interactive TA in Flanders

Meanwhile, in Flanders another STI policy vision came to the fore. Flemish policymakers, innovators, and entrepreneurs asserted that Flemish innovation policy needed a more integrated take on innovation that acknowledges the complex interplay between science, technology, and other, nontechnical groups of actors, such as social and economic sectors. Policymakers therefore called for a kind of bottom-up TA, which they described as an approach "that may not slow down or have a negative influence on creativity and the innovation process".[5] To this end TA activities had to be organized in close interaction with R&D efforts in governmental technology programs on biotechnology, new materials and energy, and environmental technology. The expectation was that if TA were conducted in direct consultation with science and technology producers, research would lead to socially useful applications.

Their successive bottom-up experience with relegating TA to R&D projects and technological programs led scientists and technologists to think critically about their research activities. However, because the institutional context for R&D did not systematically offer any incentives to civil society, as well, to reflect on technological developments, the palette of contributed perspectives shrank to those areas that are considered most relevant to scientists and engineers, notably safety and health risks, and market opportunities.

In order to create a more interactive type of TA in which Flemish civil society, as well as citizens, participate through a deliberative process, in 2000 TA was assigned to an institution advising the Flemish parliament, the Flemish Institute for Science and Technology Assessment (viWTA, later renamed the Institute Society and

Technology, IST, before the institute's closure in 2012; Delvenne et al. 2012). The institute adopted a twofold mission: to stimulate social debate on sociotechnical developments, and to inform and advise MPs on the social, ethical, and economic implications of scientific-technological developments. To these ends, viWTA initiated participatory activities within and outside the Flemish parliament (e.g., citizen workshops, public debates, and technology festivals).

It is important to note that with the erection of viWTA, TA was removed from the R&D enterprise itself. That is, in contrast to several STV programs and early-warning TA initiatives mentioned above, TA was not fully ingrained in the innovation process. Rather, TA took place in a different location and time, namely in a parliamentary setting.

The Rebirth of Parliamentary TA?

Ironically, a few years before the IST's closure, TA again gained momentum in Wallonia.[6] A political scientist at the University of Liège (and coauthor of this article), Pierre Delvenne, initiated contact with Walloon policymakers with the aim of raising awareness about TA (Delvenne 2009; Delvenne et al. 2012). After having initiated a series of interactive workshops involving government officials, consultative groups, labor unions, and others, about the prospects of TA in Wallonia, a Walloon MP by the name of Joëlle Kapompolé (Socialist Party) publicly announced a proposal for a parliamentary decree to found a TA institute linked to parliament. Other MPs, as well as the former minister for New Technologies and Research declared they would support the proposal. Subsequently, in November 2008, it was stated that a special line of funding would be considered. According to the proposal, the TA institute "should make use of participatory methods and function as an exchange and discussion platform for constructive social debate on technological options without being an obstacle to technological development". However, several issues remained to be clarified. During the 2009 regional elections, the Socialist and Ecologist parties included the concept of a TA institute in their programs.[7] After the elections, when a political majority comprising Socialists, Ecologists, and Christian-Democrats was installed, the establishment of a TA institution became part of the government's agenda.

In May 2011, the ministers Jean-Claude Marcourt (Socialist, in charge of new technologies) and Jean-Marc Nollet (Ecologist, in charge of research and science policy) referred to Kapompolé's initiative to announce a joint initiative for a full-fledged Walloon Institute of Technology Assessment. They emphasized its role for policymaking as well as its potential contribution to stimulating societal debate on science and technology. They also underlined that the new institute should function as a completely independent office within parliament and would rely on a network of experts. Government and parliament were identified as the main users of the TA structure, and to a certain extent it was even suggested that organized citizen groups would be able to ask the TA office to commission TA studies. Furthermore, the joint initiative emphasized the importance for the future structure to mobilize participatory methods, a procedure that is relatively uncommon in Wallonia.

However, political tensions between the two ministers in charge led to a blockade of the project for almost two years. These tensions were related to divergent political visions regarding the future of Wallonia rather than to opposing perspectives on TA. The main issue concerned the addressees of the TA institute: As a convinced regionalist, Marcourt wanted the TA institute to work exclusively for the Walloon region (and thus for the Walloon region's parliament and government). Nollet, on the other hand, demanded that the institute address the parliament and government of the French Community as well. Whereas the regionalist argument underlined the territorial differences between Brussels and Wallonia, the integrationist vision highlighted regional incorporation. Accordingly, Nollet planned to establish a new science policy across the whole of Wallonia-Brussels and had similar plans for TA. It took both ministers' cabinets about two years to reconcile their seemingly incompatible views.

Despite this blockade, throughout 2013 several MPs from the major political fractions consulted the SPIRAL Research Centre at the University of Liège to help initiate the establishment

of a parliamentary working group on TA in the Walloon parliament. The SPIRAL unit (supported by the PACITA project) responded by setting up a series of "Technology Assessment working lunches"[8] aimed at raising awareness of TA among MPs and their collaborators (van Oudheusden 2013). These sessions were dedicated to a TA simulation exercise on a topic of interest to MPs (e.g., aging populations, cloud computing, sustainable consumption) in order to jointly explore how TA can inform and support parliamentary work on STI. As the TA working lunches were generally well received, the parliament's president Patrick Dupriez (Ecologist) joined Joëlle Kapompolé and her colleagues from the parliamentary working group to write another decree proposal to establish a TA institution serving parliament and government, again with the support of the University of Liège. At the end of the legislature, a full-grown decree was approved in the plenary session and put on the agenda of the committees in charge of research, economy, and new technologies. However, at the end of the legislature in spring 2014, parliament was dissolved before the concerned committees could pass the decree. As a consequence, the decree presently remains in limbo in the legislative process.

3 Discussion

The historical overview above allows us to pinpoint and compare defining characteristics of Flemish and Walloon TA, partly in light of recent TA developments across Europe.[9]

To begin with, it is striking that both Flemish and Walloon TA emerged and matured in a strategic, knowledge-centered STI environment, i.e., an environment that forges new alliances between the scientific establishment, policymakers, and societal actors for the sake of science-driven economic development. In fact, Walloon TA did not mature *until* such a strategic science regime was firmly in place, bringing to the fore systemic approaches to innovation and university-industry partnerships (Fallon/Delvenne 2009). Thus, the institutionalization of TA may well *depend* upon the emergence of strategic science as a new mode of knowledge production (Delvenne 2011). Following Rip (2000), strategic science heralds a shift in scientific knowledge production from relatively isolated, "basic", academic research, to research that is economically and socially relevant and that can only be understood within a context of its use. TA potentially transforms this context by bringing more diverse epistemic cultures and "knowledges" into STI processes. Knowledge here no longer only refers to intellectual property, technological applications, and scientific theories, but also, and increasingly, to new kinds of expertise (e.g., sociological, lay, indigenous), to new forms and manifestations of relevance (e.g., social and ecological concerns), and the democratization of sociotechnical culture at large (Knorr-Cetina 1999, p. 8; Bijker 1995). TA can thus contribute to broadening, deepening, and governing knowledge in contemporary KBEs, which is precisely what STI policymakers and various innovation enactors claim innovation is, or *should be*, about.[10]

The emergence of the EU-wide Science in Society projects like Parliaments and Civil Society in Technology Assessment (PACITA 2011–2015) lends weight to the above hypothesis.[11] While it is too early to determine the policy impact of PACITA, it is important to note that PACITA is designed to facilitate "coordination and networking activities, dissemination and use of knowledge" in support of research activities and policies. In fact, PACITA is construed as a "Mobilisation and Mutual Learning Action Plan [that] will distribute capacity and enhance the institutional foundation for knowledge-based policy-making on issues involving science, technology and innovation (…)".[12] The potential influence of PACITA is felt in Wallonia, which in contrast to Flanders has never institutionalized TA, but which now explicitly gears its STI policy towards the KBE and strategic science (Plan Marshall 2. Vert; Plan Marshall 2022).

It would thus appear that TA not only relies on, but *thrives in,* the context of knowledge-driven innovation. However, if TA is to exert a *lasting* influence in the KBE, TA actors must clearly present TA's credentials as a decisive knowledge player to policymakers and innovation actors. We return to this point shortly.

Second, Flemish and Walloon TA tap into a political culture that emphasizes the importance of concerted social action. In Belgium, collective

bargaining between trade unions, employers' organizations, and governments is an important political and social tradition that allows TA practices to gain a firm foothold in multilayered, consociational democracies (Lijphart 1977). The erection of the Flemish TA institute STV in response to the DIRV campaign and the lodging of a Walloon TA mission in the Economic and Social Council (CESRW) in the 1990s illustrate this point, as trade unions demanded their say in STI policymaking.[13] Seen in this way, TA can arbitrate between scientific, political, and social worlds. When TA is integrated into R&D settings (e.g., Flemish technology action programs) and/or embedded into parliaments or other formal policymaking bodies, it can open new negotiation practices and establish a more integrative and inclusive decision-making culture.

However, the institutionalization of TA also entails risks. As noted earlier, when the IST (formerly viWTA) was installed in the Flemish parliament in 2000, TA was physically removed from the R&D process. Thus, while TA gained a foothold within formal Flemish policy circles, it became less ingrained in scientific and technological research activities across the region. In addition, as Horst (2014) argues in relation to the restructuring of the DBT by the Danish government in 2011, when TA is embedded within formal policy-making bodies and processes, it risks being domesticated or "tamed". This is because established organizations may find it hard to change, adapt, and reposition themselves to meet new needs in complex and changing environments (Gubrium/Holstein 2001). As Horst notes, in Denmark democratic debate about science and technology lost momentum *after* the DBT's institutionalization in 1986. In the years that followed, Danes came to take debate of this kind for granted. In fact, many Danes appeared ignorant of the DBT's existence in spite of its high international visibility.

Whether or not similar assertions can be made about the closing of the Flemish IST is an open question, which we do not delve into in this article. Rather, we want to draw attention to the political affiliations of Flemish and Walloon TA. As illustrated by the erection of STV in 1984, Flemish TA emanated on the left side of the political spectrum, specifically among the green and socialist parties. The same political families initiated parliamentary TA, which led to the erection of viWTA (IST) in 2000. Arguably, in Wallonia the politics of TA are not so outspoken or visible. Yet, it should be noted that the Socialist and Ecologist factions took the initiative to institutionalize TA and that TA is typically associated with a political preference for more participatory or deliberative modes of decision making. These preferences are not neutral. They have been reproduced in a great number of other European countries where left-wing political parties play, or played, a key role in institutionalizing TA (Delvenne 2011). As noted elsewhere (van Oudheusden 2014), TA's political affiliations are often denied or downplayed across TA communities. TA is typically framed as an analytic activity aimed at providing decision makers with an objective analysis of a technology (van Eijndhoven 1997) and/or as an interactive and communicative tool that aims to enrich the basis for public debate and STI decision making (Decker/Ladikas 2004). These broad designations (i.e., geared towards all political factions and to the benefit of all innovation actors) risk trivializing and undermining the very policy changes TA advocates seek to instigate when TA is associated with *specific* political parties or politicians.

The above considerations deserve to be taken into account, as they shed light on how and why TA is institutionalized (or conversely, de-institutionalized), and how TA is enveloped in broader STI processes, such as the EU-wide shift towards responsible innovation (von Schomberg 2011). They are also helpful when reflecting on the evolving viability and utility of TA within contemporary KBEs, as TA and STI processes have coevolved as "dancing partners," relatively independent from one another and yet in continuous interaction (Rip 1992). The Flemish and Walloon TA experiences described in this article can thus serve TA communities, STI policymakers, and innovation scholars as entry points to ponder the role, place, and orientation of regional, national, and European TA in the years ahead.

Acknowledgment

This work was supported by the Walloon Fonds de la Recherche Scientifique (FNRS).

Notes

1) Marshall Plan is the name given to a broad socioeconomic policy program that intends to revitalize the Walloon economy along the lines of innovation, entrepreneurship, and creativity.
2) In a case study approach to "expanding the TA landscape in Wallonia", Delvenne et al. (2013, pp. 283–284) provide a more detailed account of the institutional fragmentation of STI competence in Belgium. They point to differences between Flanders and Wallonia that hindered the emergence of KBE rationales in Wallonia.
3) Notably through the EU-wide Framework 7 project Parliaments and Civil Society in Technology Assessment (PACITA), on which more follows below.
4) The term "social partners" is often used in Belgian policy discourse and encompasses employers' organizations and trade unions. These actors are regularly engaged in formalized and structured socioprofessional negotiations following the political model of consociationalism (Lijphart 1977).
5) Technology Note of the Flemish government (1994).
6) It is worth noting that the closure of IST hardly drew policy attention in Wallonia, whereas TA, as a topic of interest, did. This says much about the effects of regionalization of Flemish and Walloon STI policy and the public scope of debates on science in society in Belgium.
7) In Wallonia and Brussels, the green, or environmentalist, political party is called Ecolo, which is short for the French word écologiste.
8) Prior to these TA working lunches, an international conference was held in the Walloon parliament (March 8, 2013), which gathered former and actual directors or senior staffers from TA institutions in the United States and Europe. See van Oudheusden (2013) and the event's website, http://tapw.wordpress.com/, last accessed on September 3, 2014.
9) These reflections build on and are further developed in van Oudheusden et al. 2014.
10) Consider the many EU policy discourses on integrating science in society for the sake of good innovation governance. For instance, in a 2013 Expert Group Report to the EU's Directorate General for Research and Innovation, we read that "The [Responsible Research and Innovation] approach has to be a key part of the research and innovation process and should be established as a collective, inclusive and system-wide approach" (http://ec.europa.eu/research/science-society/document_library/pdf_06/options-forstrengthening_en.pdf).
11) See http://www.pacitaproject.eu.
12) See the EU CORDIS website: http://cordis.europa.eu/project/rcn/98487_en.html
13) The aforementioned EMERIT project sustained the idea of enlarging the social dialogue to encompass science and technology issues, with the participation of civil society, while acknowledging the formalized and structured social dialogue typical of the Belgian model of concerted social action.

References

Bijker, W., 1995: Of Bicycles, Bakelites and Bulbs: Toward a Theory of Sociotechnical Change. Cambridge, MA

Decker, M.; Ladikas, M., 2004: Bridges Between Science, Society and Policy. Berlin

Delvenne, P., 2009: Gouvernance et Technology Assessment en Wallonie [Governance and Technology Assessment in Wallonia]. In: Courrier Hebdomadaire du CRISP 2037 (2009), pp. 1–43

Delvenne, P., 2011: Science, Technologie et Innovation sur le Chemin de la Réflexivité. Mise en Perspective des Offices Parlementaires de Technology Assessment. Louvain-la-Neuve

Delvenne, P.; Evers, J.; Rosskamp, B., 2012: Parliamentary Technology Assessment in Flanders, Belgium. In: Ganzevles, J.; van Est, R. (eds.): Description of Parliamentary Technology Assessment Institutes. FP7 PACITA Project

Delvenne, P.; Rosskamp, B.; Fallon, C., 2013: Explorative Region Study: Wallonia, Belgium. In: Hennen, L.; Nierling, L. (eds.): Exploring the Technology Assessment Landscape. FP7 PACITA Project

Fallon, C., 2011: Les Acteurs-réseaux Redessinent la Science. Le Régime de Politique Scientifique Révélé par les Instruments. Louvain-la-Neuve

Fallon, C.; Delvenne, P., 2009: Les Transformations Actuelles du Régime de l'Innovation en Wallonie: Une Analyse des Pôles de Compétitivité. In: Innovation – The European Journal of Social Science Research 22/4 (2009), pp. 411–425

Goorden, L., 1990: De Stichting Technologie Vlaanderen en Technology Assessment. In: Tijdschrift voor Arbeidsvraagstukken 6/2 (1990), pp. 79–89

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

Gubrium, J.; Holstein, A. (eds.), 2001: Institutional Selves: Troubled Identities in a Postmodern World. New York

GW – Gouvernement Wallon, 2005: Le Plan Marshall: Les Actions Prioritaires pour l'Avenir Wallon. Namur

Halleux, R.; Xhayet, G.; Demoitié, P., 2009: Pour la Science et Pour le Pays. 50 Ans de Politique Scientifique Fédérale. Liège

Horst, M., 2014: On the Weakness of Strong Ties. In: Public Understanding of Science 23 (2014), pp. 43–47

Joss, S., 1998: The Role of Participation in Institutionalised Technology Assessment. A Case Study of Consensus Conferences. Unpublished PhD thesis. London

Knorr-Cetina, K., 1999: Epistemic Cultures. Harvard

Kunkle G., 1995: New Challenge or the Past Revisited? The Office of Technology Assessment in Historical Context. In: Technology in Society 17/2 (1995), pp. 175–196

Lijphart, A., 1977: Democracy in Plural Societies: A Comparative Exploration. New Haven

Oosterlynck, S., 2006: The Political Economy of Regionalism in Belgium: Imagining and Institutionalising the Flemish Regional Economy. Unpublished PhD Dissertation. Lancaster

Rip, A., 2000: Fashions, Lock-Ins, and the Heterogeneity of Knowledge Production. In: Jacob, M.; Hellström, T.A. (eds.): The Future of Knowledge Production in the Academy. Buckingham, pp. 28–39

Rip, A., 1992: Science and Technology as Dancing Partners. In: Kroes, P.; Bakker, M. (eds.): Technological Development and Science in the Industrial Age. Dordrecht, pp. 231–270

Schot, J.; Rip, A., 1997: The Past and Future of Constructive Technology Assessment. In: Technological Forecasting & Social Change 54/2–3 (1997), pp. 251–268

SERV – Sociaal-Economische Raad Vlaanderen, 1994: De Vlaamse technologieprogramma's. Enkele ervaringen met Technology Assessment. Brussels

SERV – Sociaal-Economische Raad Vlaanderen, 1998: Advies over het voorontwerp van decreet betreffende het voeren van een beleid ter aanmoediging van de technologische innovatie. Brussels

van Eijndhoven, J., 1997: Technology Assessment: Product or Process? In: Technological Forecasting and Social Change 54/2 (1997), pp. 269–286

van Oudheusden, M., 2013: Broadening the Knowledge Base in Policymaking: Notes on a Symposium on Technology Assessment in the Walloon Parliament. In: European Association for the Study of Science and Technology Review 32/2 (2013), pp. 9–11

van Oudheusden, M., 2014: Where are the Politics in Responsible Innovation? European Governance, Technology Assessments, and Beyond. In*:* Journal of Responsible Innovation 1/1 (2014), pp. 67–86

van Oudheusden, M.; Charlier, N.; Rosskamp, B. et al., 2014: Broadening, Deepening, and Governing Innovation: Flemish Technology Assessment in Historical and Socio-Political Perspective. In Review

VIA – Vlaanderen in Actie, 2006: http://www.vlaandereninactie.be

von Schomberg, R., 2011: Prospects for Technology Assessment in a Framework of Responsible Research and Innovation. In: Dusseldorp, M.; Beecroft, M. (eds.): Technikfolgen abschätzen lehren: Bildungspotenziale transdisziplinärer Methoden. Wiesbaden, pp. 1–19

Witte, E.; Craeybeckx, J.; Meynen, A., 1997: Politieke geschiedenis van België van 1830 tot heden. Brussels

Contact

Dr. Michiel van Oudheusden
SPIRAL – Université de Liège
BAT. B31
Blvd. du Rectorat, 7, 4000 Liège 1, Belgium
Email: michiel.vanoudheusden@ulg.ac.be

« »

No Countries for Old Technology Assessment?

Sketching the Efforts and Opportunities to Establish Parliamentary TA in Spain and Portugal

by Knud Böhle, ITAS, and António Moniz, ITAS and Universidade Nova de Lisboa

If the question is whether there is a parliamentary technology assessment (PTA) unit in Portugal or Spain, the clear answer is that there is still no such unit at the central state level at the present time, neither in Portugal nor in Spain. The question then has to be modified addressing previous and current efforts to establish PTA and the current framework conditions and opportunities. Practices of PTA are framed here as a democratic innovation in the context of changes in representative democracies. Against this backdrop, the efforts and opportunities to establish PTA in Spain and Portugal are studied. By sketching these developments and outlining the opportunities in these countries, our aim is to contribute to the debate about the likelihood of a new wave of PTA in Europe (Hennen/Nierling 2014).

1 Introduction: Parliamentary Technology Assessment as a Democratic Innovation

Attempts at identifying parliamentary TA units and TA activities in various countries presume a prior understanding of what TA and, more specifically, what PTA is.[1] Essentially, TA has to be approached as an analytic or scientific *and* a democratic practice (van Est/Brom 2012). As the former, it is concerned with dynamic and complex sociotechnical issues from the perspective of political relevance. It incorporates knowledge from the sciences and also nonscientific knowledge, and employs methods from the social sciences to acquire this knowledge. As a democratic practice, it contributes "to the formation of public and political opinion on societal aspects of science and technology" (Bütschi et al. 2004, p. 14). It is worth highlighting the two addressees: the political system *and* the public sphere. Since TA studies are publicly available, they can be scrutinized and criticized by everyone, for instance by political parties, civil society organizations, entrepreneurs, and scientific communities.

In order to consider the viability and desirability of TA in various countries with their specific social, political, economic, and cultural settings, TA should be introduced as a *democratic innovation*. We elaborate this assumption a little bit further because it offers a new perspective for looking at the opportunities for PTA in Portugal and Spain. This concept allows for TA to be, first, situated historically in the broader context of the current transformations of Western representative democracies and, second, to be analyzed by employing concepts stemming from innovation studies, such as opportunity structures, political entrepreneurs, innovation networks, and failed innovations.

In the last decades many Western democracies "have experimented, tested, and implemented innovations with the aim of enhancing the working and quality of democracy as well as increasing citizens' political awareness and understanding of political matters" (Merkel 2008, online). Scholars of the transformation of democracy have come up with different concepts for designating the new forms that have emerged: "contestatory democracy" (Pettit 1999), "advocacy democracy" (Dalton et al. 2003), "responsive democracy" (Teorell 2006), and "monitory democracy" (Keane 2009a; Keane 2009b).

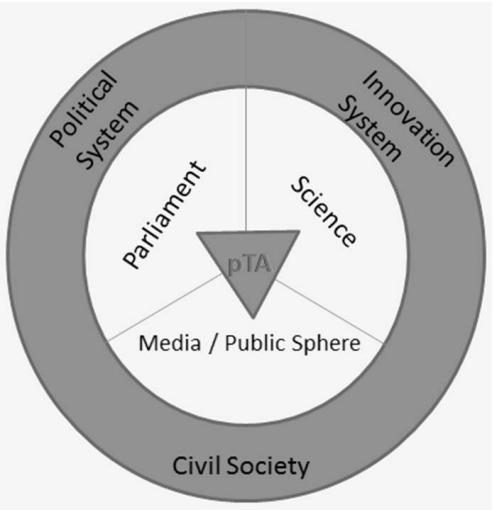
They all contain elaborations of the basic idea that political control in democratic societies and thus "the whole architecture of self-government" (Keane 2009b, online) is changing. Self-government, as Scharpf (1997, p. 19) has pointed out, is about collectively binding decision making (input legitimacy) *and* effective state control (output legitimacy). Keane, stressing the control aspect, explains the concept of "monitory democracy" as an emerging historical form of democracy "in which power-monitoring and power-controlling devices have begun to extend sideways and downwards through the whole political order" (Keane 2009a, online).

It has to be added that the new power-scrutinizing mechanisms, and PTA as a case in point, are closely related to the public sphere. The public

sphere today has to be understood as a communication space to which the media and the general public contribute, as does parliament.[2] The public sphere represents the context in which problems that must be solved (= policy relevant problems) are discovered, and the public has the legitimate expectation that these problems are dealt with in a rational and accountable way by the government and that the appropriateness and effectiveness of the measures taken is watched over by parliament and public sphere. PTA (like parliament) is located within this loop of the public perception and articulation of problems and their political processing. TA can serve as a scrutinizing mechanism supporting parliament's function of controlling government and can contribute to the formation of public opinion and political will.

The changes in representative democracies that have taken place during the past few decades constitute the appropriate broader perspective for observing and understanding the emergence of PTA. If we acknowledge that PTA serves the identification and articulation of technology-related societal problems *and* the parliamentary control of government policies, its potential role in a monitory democracy becomes clear. TA, independent of its many varieties of implementation, can be understood as a democratic innovation involving parliamentarians, scientists, and the public sphere. In figure 1, we graphically depict the narrower and wider context of PTA.

Fig. 1: PTA in Context



Source: Diagram by the authors

A look at the narrower and broader context is necessary to reveal the opportunity structures and the barriers to establishing PTA as a democratic innovation. The outer circle comprises the more general framework conditions and the dynamics at the level of the political system, at the level of civil society, and in the science and innovation system. The more specific inner circle points to the most relevant interfaces and relations of PTA.

According to Hennen/Nierling (2014, p. 3), in the 1970s and 1980s there was obviously a favorable opportunity structure, which eventually led to the institutionalization of PTA in *some* of the wealthier and highly industrialized European countries – referred to often as the first wave of PTA. Getting a bit more specific, but still at the level of constructing an ideal type of opportunity structure, Hennen/Nierling indicate the requirements at different levels: a highly developed and differentiated system of research and development (R&D) with a strong and visible commitment from the government and a strong parliament establishing corresponding parliamentary structures, e.g., a standing committee on science and technology. Further, parliament has to become aware that it needs independent support from the best available scientific knowledge to fulfil its function, and the science sector needs to be engaged in problem-oriented research (systems analysis, risk assessment, STS, ethics etc.) and prepared to provide policy advice in the form of technology assessment. Last but not least, other matters regarded as an element of the opportunity structure are a public sphere with an interest in S&T issues and a demand by citizens, civil society organizations, and social movements to have a say in decision-making processes in science and technology (cf. Hennen/Nierling 2014, p. 3). Analyzing the cases of Spain and Portugal we will bear this in mind.

2 Case Study: Spain

2.1 Social and Economic Background

After a traumatic civil war (1936–1939) followed by almost 40 years of dictatorship with long-lasting effects on the political culture, Spain's transition to democracy in the second half of the seventies took place within a few years. In

November 1975 Franco died, and in December 1978 the new constitution came into effect. This speedy and relatively smooth transition has been admired by many observers.[3] The social and economic perspectives were bright, the expectations high, and the catching up process of the Spanish research and innovation system was further strengthened by Spain's membership in the European Community in 1986.

The economic crisis has been palpable since 2008, hitting Spain hard and revealing profound weaknesses in its innovation system. The Spanish government is addressing these challenges by adopting a new Law for Science, Technology and Innovation in 2011, which was followed by a Spanish Strategy for Science, Technology and Innovation (2013–2020) and the Spanish State Plan for Scientific and Technical Research and Innovation (2013–2016), adopted in February 2013 (cf. Fernández-Zubieta 2014, pp. 12–17).[4] The structural deficits of the Spanish research and innovation system have been the subject of many studies, which have also included recommendations regarding how to change the old model (see for details, instead of others, ERAC 2014; Fernández-Zubieta 2014; Cotec 2013; OECD 2014). One significant indicator showing the profoundness of the crisis in a nutshell is the unemployment rate of young persons (under 25), which was at 53.7 % in August 2014, the highest rate of the 28 EU members (Eurostat 2014).

The crisis Spain is experiencing is also a political crisis. Political disaffection is directed primarily at the two major political parties (PP and PSOE), which dominate Spanish politics. They are accused of being corrupt and incompetent (cf. Feenstra/Keane 2014, online). As both parties are corrupt, the bone of contention is which party is more corrupt than the other (Nohlen 2012, p. 156). Various authors also confirm that these parties tend to perpetuate the long-standing dichotomous narrative of the "two Spains", which both employ in political conflicts to attribute guilt or responsibility and to explain why reconciliation or sociopolitical integration is not possible in Spain (Juliá 2004; Kühn 2012). The observation that the media often position themselves close to the positions of political parties adds to this picture (Nohlen 2012, p. 149).

In general terms, the political system is assessed as being insufficiently sensitive to social demands (cf. Jiménez 2011, p. 63) and as divorced from civil society (Oñate 2013, p. 49). The distance of citizens from formal politics is confirmed by empirical research about Spain's political culture. Research used to find a rather low level of interest in politics among the population in general and a low level of political participation of various forms compared to other European countries, but a very high level of collective forms of participation like the signing of mass petitions, strikes, and especially demonstrations (Torcal et. al 2006, pp. 16 et seqq.; Gómez/Palacios 2012, p. 506; Font/Méndez 2008, pp. 546 et seqq.). Demonstrations increased after 1986, and increased even further after 2000 (Jiménez 2011). This pattern of participation reached a new level with the citizen movement known as the 15-M movement (referring to May 2011, when massive social protests started in the streets).

Feenstra/Keane (2014) have analyzed this movement as a push towards "monitory democracy" and taken stock of the changes brought about so far by this movement in terms of power-scrutinizing mechanisms. They mention, for instance, the formation of "anti-party" political parties (e.g., Podemos), making use of legislative citizen initiatives, the creation of independent newspapers and electronic media fostering investigative journalism, and internet platforms scrutinizing parliamentary work. Oñate compares the 15-M movement to the protest movements in other European countries in the sixties and seventies. He holds that this movement may change politics in Spain, bringing about more responsiveness, accountability, and transparency of politics and more channels of participation for citizens.

The parliament in Spain is relatively weak for two main reasons. On the one hand, party discipline of MPs is very strong, and on the other hand, the power of the prime minister is so strong that scholars of political systems tend to classify Spain as a semi-presidential democracy (Friedel 2010). This state of affairs is a legacy of the transition, which for good reasons aimed to prevent institutional instability and political fragmentation, and therefore favored strong parties, easy obtainable parliamentary majorities, and strong

governments. The general framework of relations between government and parliament followed an orientation emphasizing security instead of liveliness (Guerrero 2005, p. 12). The list of necessary political reforms is long, including the proposal to extend the parliamentary advisory structure since the parliament should not depend entirely on information provided by government and be able to receive expertise from professionals from different disciplines (ibid., p. 18).

2.2 TA Initiatives in the Context of R&D Policies

The efforts to establish TA in Spain at the level of the general parliament have not been thoroughly studied. The history of these intentions and attempts, however, is important as it constitutes one element of the current opportunity structure. There are some indications that there have been repeated efforts from 1989 to the present day.

In synchrony with the first wave of TA in Europe, a new "Law of Science" was adopted in Spain in 1986, which is regarded as providing the institutional structure offering various possibilities for implementing TA. To establish TA at parliament was just one option at that time. Luis Sanz, one of the most distinguished scholars of research policy, held that the Advisory Council of Science and Technology (CACT) was the "institution with the greatest chance of performing an independent technology assessment role" (Sanz/Goicolea 1987, p. 16). Following the Law of Science, this body should become the effective link between the scientific community, social agents, and policy makers in order to achieve R&D policies appropriate to the different interests and needs of society. Another realistic option would have been ANEP, the National Agency for Evaluation and Foresight (Agencia Nacional de Evaluación y Prospectiva) serving the Interministerial Commission for Science and Technology – provided it would have been sufficiently independent (Sanz 1989, pp. 167 et seqq.).

The protagonist of the first parliamentary initiative was Miguel Ángel Quintanilla, who was a senator at that time and the president of the Mixed Committee of Congress and Senate on Science and Technology, which had been established based on the "Law of Science" mentioned above. He proposed to create an Office of Scientific Advice (Oficina de Asesoramiento Científico). But the proposal foundered as it could not be substantiated within the legislative period before the elections of October 1989. The contributions to an international seminar on the institutionalization of TA in Spain, which was organized by the Senate (Quintanilla 1989) and took place before the elections in 1989, suggests that there was no strict dividing line between those who were in favor of a parliamentary TA unit and those who preferred advisory bodies related to the executive power. The joint ambition of the participants was to introduce TA in the political system.[5] Against this Spanish background, Sanz has always pointed out the enormous importance of the institutional setting when reflecting the right place for TA in the political system (Cruz/Sanz 2005). It also appears that in Spain the idea of TA was more focused on the evaluation of R&D policy than elsewhere (cf. Sanz 1995; Fernández 2011).

Looking at foresight (competing with or complementing TA) as an element of the opportunity structure for TA in Spain at that time, we see the Observatory of Industrial Technology Foresight (Observatorio de Prospectiva Tecnológica Industrial, OPTI), which was created in 1997 by the Ministry of Science and Technology with the aim of carrying out foresight studies and technology watch with a focus on technological trends and the needs of Spanish industry (Böhle 2003). Subsequently, the Observatory of Sustainability in Spain (OSE) and a Unit of Analysis and Foresight were created, the former in 2005 and related to the Ministry of Environment and the latter in 2006 by the then Ministry of Agriculture, Fisheries and Food (EEA 2011, p. 7). But overall, as the EEA remarked when taking stock of Foresight in Spain, foresight is "far from influencing policymaking" and has not been "institutionalized as a tool for policymaking" (EEA 2011, p. 16). In other words, the practice of foresight in Spain cannot be seen as compensating the lack of TA.

Turning back to TA proper, a further attempt to establish TA took place in 2003/2004. Following Varela (2004) who was a member of the Committee on Science and Technology of the Senate between 2000 and 2004, a motion was approved

by this Committee asking the government to give its opinion on the establishment of an Office of Scientific Advice. The government responded positively in October of the same year and even declared its disposition to cooperate with the legislative power to support the establishment of such an office, and further envisaged that this body should become a member of the EPTA Network. Other options, elaborated by Sanz, as how to embed the TA function in the institutional structure were also available at that time. Yet within this legislative period nothing was decided and nothing happened before the elections of March 2004.

In the period 2004–2008 such an office was proposed once again, this time from within the Committee of Education and Science of Congress, namely by Mercedes Cabrera (social scientist), who became minister of education and science in 2006 (CSIC 2008, p. 45).

In 2008, after the elections in March, we see that TA is still a topic. In a seminar in May (Encuentro Nacional de Política Científica y Tecnológica), comparable to the one in 1988, bringing together experts from science and politics, the conclusion was that a greater involvement of parliament in the national R&D system would be important and that to this end a body advising parliament in matters of science and technology was proposed. The résumé of the rapporteur also pointed out the caveats containing the many prerequisites which would have to be fulfilled in order to make such a body work effectively and reminding everyone of the earlier failed initiatives (CSIC 2008, p. 10, see also p. 24, p. 45).

Today, the Law of Science, Technology and Innovation (2011) envisages "the introduction of mechanisms of social assessment of science, technology and innovation into the Spanish Science and Technology system in order to assess the interactions between technological development and society…" (cf. Revuelta 2011, p. 25). The task of promoting such a mechanism was given to the Advisory Council for Science, Technology and Innovation. Furthermore, the scientific community was also still promoting the idea of establishing a TA unit to advise the parliament. In December, 2012, the Confederation of Spanish Scientific Societies (COSCE), representing more than 40,000 scientists suggested itself as suited to advise parliament (Andradas 2012, p. 19).

While there is no story to tell about a parliamentary TA unit at the central state level, there is one success story at the level of the autonomous communities of Spain, namely CAPCIT, the Advisory Board of the Parliament of Catalonia for Science and Technology (Consell Assessor del Parlament sobre Ciència i Tecnologia), which was established in 2008 (O'Reilly et al. 2012). Previously, in 1999, the Catalan government had created CACIT, an Advisory Commission on Science and Technology, for its purposes. In 2003 the Parliament urged the government to formally link CACIT to the Catalan Parliament. In 2008 "an offer of scientific and technological advice was made to the Catalan parliament by the Catalan scientific community" (O'Reilly et al. 2012, p. 47), and in November 2008 CAPCIT – now with a "P" for parliament – was formally established. In 2009 it became member of EPTA.

"… CAPCIT focuses on TA and the relationship between the Catalan Parliament and science conducted in Catalonia" (Domínguez 2012, p. 132). CAPCIT is a mixed body currently composed of 20 members, 10 each representing MPs and the main scientific and technical institutions of Catalonia. All the political parties are represented in this group, to which two members of the Presiding Board and the President of the Parliament – who is also the president of this mixed body – belong. The secretary of CAPCIT is one of the lawyers employed by parliament. In legal terms, CAPCIT is similar in nature to the intergroups of the Catalan Parliament (cf. Domínguez 2012, p. 133).

Domínguez clarifies that he does not regard CAPCIT as an instance of the "office model" of PTA, which it has often been considered in international comparisons (e.g., Hennen/Ladikas 2009, pp. 44 et seqq.; Enzing et al. 2012, p. 13). In his view, CAPCIT follows the parliamentary committee model. Following the PACITA modelling of parliamentary TA organizations, which overcomes the unfruitful distinction of office vs. committee model, the Catalan case corresponds to Model 2 "shared parliament – science involvement" (Ganzevles/van Est 2012, p. 198, p. 216; see also Ganzevles et al. in this volume). The par-

liamentary TA organizations in Germany and the UK and of the European Parliament fall into the same category. CAPCIT does not directly provide TA. The scientific and technical institutions represented in CAPCIT are usually commissioned to produce reports and to provide advice.

One peculiarity of CAPCIT is that there is no designated staff. Staff working for parliament has to do the administrative work (O'Reilly et al. 2012, p. 51). It also has no budget of its own and therefore depends on existing parliament resources for support (ibid, p. 48). The studies are paid by the institutions performing them. It is also noteworthy that the studies completed do not have to correspond to predefined standards and are not made available to the public by parliament. The research organizations, however, may consider publishing them on their own. The production of TA studies – an average of less than one finished study per year – is obviously not the strength of this TA institution. The impact and the role of CAPCIT in politics and the level of awareness among MPs is regarded as rather limited (ibid., pp. 49 et seqq.). This could be said of other TA bodies too. The relevant point is to see that CAPCIT represents a unique institutional form of an interface between the heads of science organizations of a region and the regional parliament. The following description of CAPCIT by its secretary is telling:

> "CAPCIT itself is a forum that can be seen as a way to bring together the political and scientific worlds. Equally important as the information and scientific reports it provides is the opportunity for MPs and scientists to meet and thus to personally and directly present their ideas and visions. CAPCIT can foster mutual trust between scientific and technical institutions and the Parliament of Catalonia" (Domínguez 2012, p. 134).

2.3 Current Opportunity Structure

Regarding the opportunity structure for TA in Spain, we hold, as a hypothesis to test, that Spain has all it takes to institutionalize TA – even if it today seems hard to find catalyzing TA evangelists and entrepreneurs who could turn mere contingency into opportunity, and even if the economic crisis, a lack of societal awareness and the political will of the relevant actors make it unlikely to happen soon.

Considering the political sphere, we find that there have been advisory bodies in the field of science, technology, and innovation policy continuously since 1986, which have allowed the scientific community to provide advice which may have included TA too. Gómez et al. (2014, p. 455) even wonder about the poor state of TA in Spain given the many potential actors who could have assumed this task. It is not far-fetched to think that what happened in Catalonia – i.e., the transformation of a governmental advisory body into a body (also) serving parliament – could have happened at the central state level, too.

A difference might be that the parliament in Catalonia is somewhat stronger, that the scientific sector in Catalonia is more influential, and that the idea to implement this democratic innovation even earlier than the central state – including the prospect of EPTA membership – was appealing. European encouragement could be the key to creating the necessary momentum for the institutionalization of TA at the central state level. Think for instance of the involvement of Spanish MEPs, a broader integration strategy of EPTA, a role for the JRC with its Institute for Prospective Technological Studies (IPTS) in Seville, and the participation of more Spanish research institutes in Horizon 2020 projects, e.g., on RRI (responsible research and innovation).

Looking at civil society and the public sphere, it is undisputed that there is an absence of a strong environmental and antinuclear movement and a low level of demand articulated by the public for it to participate in technology policy decisions (López et al. 1998). The concerns of the Spanish population today are, as the MASIS country report points out, "in order of importance: unemployment, crisis, politicians, immigration, housing, terrorism, insecurity, social problems, education, environment/pollution and health. That is, Spanish citizens do not directly consider science itself as a cause for concern or debate" (Revuelta 2011, p. 9).

This notwithstanding, Spanish citizens have raised their voices and become active with respect to very concrete issues and projects "clearly following the 'not-in-my-backyard' syndrome"

(Todt 1999, p. 212). Furthermore, the impression that there are no and have not been any political conflicts at all about technology would be wrong. GMO, stem cell research, and the phasing out of nuclear power plants as well as health issues such as the effects of electromagnetic fields are issues that arouse public debate and mobilize energy (Revuelta 2011, pp. 11–15). Taking regional issues into account, further causes of citizen involvement include items such as the urban development of Barcelona, eucalyptus plantations in Asturias, and water management in Catalonia (Gómez et al. 2014, p. 459).

Recent changes in civil society and the political system in the direction of "monitory democracy" resulting from demands for responsiveness and accountability could mean a change provided that the new political parties and other organizations of civil society find that TA is a democratic innovation and a scrutinizing mechanism in line with their own intentions and ideas. To be fair, the signals we receive from this direction are, however, still rather weak.

With regard to the science system, we find a well-developed, although scattered landscape of research associated to TA (STS, innovation studies, policy studies, foresight, health technology assessment etc.). Interdisciplinary problem-oriented research, STS studies (cf. Gómez et al. 2014, pp. 458 et seqq.), research policy studies, and innovation studies are well established with roots that can be traced back to the 1980s. An early example was the report by a group with Manuel Castells for the Office of the Prime Minister on new technologies (cf. Sanz/Goicolea 1987, p. 19). Cuevas/López (2009) give an account of the research institutes established since the 1980s performing STS studies. In the 1990s, postgraduate studies related to STS were established in various universities, and "science, technology and society" has even become an elective school subject in high school since 1990 (ibid, p. 43). There are also some examples where STS was involved in tackling controversial public policy issues (see the examples in Gómez et al. 2014, p. 459). Nevertheless, the conclusions of the analysis by Cuevas/López (2009, pp. 46 et seqq.) will still be valid. They state that STS research in Spain is not yet sufficiently embedded in society and that its potential remains unleveraged. Challenges remain in the field of the public understanding of science, participation by civil society, and orientation for political decisions (cf. also Revuelta 2011).

What seems to be missing is a common focus on TA and the ambition to provide advice to policy-makers and to the public. Maybe the STS community with its international reputation, the Spanish Council for Scientific Research (CSIC) with the Institute of Innovation and Knowledge Management (INGENIO, a joint Institute of CSIC and the Polytechnic University of Valencia) and the Institute of Public Goods and Policies (IPP, the former Comparative Politics and Policy Unit) could become protagonists. Alternatively, associations (like COSCE, see above), academies (e.g., the Spanish Royal Academy of Sciences), or foundations such as FEYCIT (Spanish Foundation for Science and Technology) could assume this task.

A more comprehensive picture of the state of policy advice on science and technology matters in Spain would have to include an analysis of those advisory bodies already in place that fulfill TA functions such as the Spanish Bioethics Committee, the Spanish Committee on the Ethics of Research, or the Subcommittee (154/7) of the Spanish Congress studying social networks (Subcomisión de Estudio sobre las Redes Sociales).

3 Case Study: Portugal

3.1 Economic and Political Background

Portugal experienced social, political, and economic changes during the twentieth century similar to those in Spain. Portuguese society suffered a long period of dictatorship under Salazar and Caetano, who maintained a political system comparable to the Franco regime. The colonial war since 1961, the obstacles to entering the Common Market (although belonging to NATO), censorship, strong emigration, and the absence of investments in its infrastructure and education system characterized the imbalanced social system and led to increased social tension and political unrest. Against this background, pro-democratic movements emerged and got stronger, eventually leading to the fall of the regime (carnation revolution) in April 1974. The new

democratic regime freed political prisoners, reintroduced the freedom of speech and of political organization, and started a process of introducing democratic elections and establishing a new constitution. This transition process went through the election for the constitutional parliament (April 1975) and for the legislative parliament (April 1976). These two elections in the two consecutive years after the April 1974 *coup d'état*, enabled the establishment of a balanced executive-parliament relationship (cf. Leston-Bandeira 1999; Leston-Bandeira 2004; Freire et al. 2002). In parallel, the large national research institutes were reorganized, as was the university system.

Portugal became full member (together with Spain) of the European Economic Community – EEC – in 1986. From 1976 until this event, negotiations with the EC had taken place, the investment on science and technology (S&T) increased, and a renewal of the industrial infrastructure and support services was brought about. New programs targeting technological innovation stimulated the modernization of the country and eased the European integration. The S&T expenditures in relation to the GDP, however, were only 0.34 % in 1980 and 0.4 % in 1984, and most was spent in the public sector.

3.2 TA Initiatives in the Context of Changing R&D Policies

First initiatives related to scientific advice for science policy took place as early as the 1960s. To support the national budget services in preparing the economic plan, a special office had been established to carry out assessment studies and economic foresight studies.[6] The most important innovation was probably the creation of the National Board of Scientific and Technological Research (JNICT) in 1967. The mission of this board was to plan, coordinate, and promote science and technology research and to advise the government on national science policy.

More profound interest in TA came up in the late 1980s within JNICT, which had meanwhile assumed new tasks targeting the development of the national science and technology system and sponsoring in particular large national laboratories. In the new democratic framework, JNICT also fomented the creation of a large scientific community and supported the emergence of research centers in new technology fields (computer sciences, astronomy, biotechnology, social sciences), trying to achieve targets the OECD had defined for Portugal.

Even then, there was already a TA-related community performing innovation studies. That community had emerged within the research fields of technological innovation and economic development. A national program (cofinanced by the EC's structural funds) to support innovation in the economic productive structures, e.g., industry, telecommunications, and logistics, made possible the research and publication of many studies on several cases, sectors, and regions.[7] The research community of innovation studies was mainly an academic one.[8] Internationalization of research in this area opened a space for members of this community to get in contact with TA experts from other countries. The seminal paper by João Caraça and Fernando Gonçalves entitled "Towards Technology Assessment in Portugal" was presented at a conference on Technology Assessment – An opportunity for Europe organized by the European Commission (EC) in Amsterdam in 1987. There, these authors stated that in Portugal "TA types of activities have been carried out largely through the public sector" (Gonçalves/Caraça 1987, p. 8). And by "public sector" the authors mean large institutes in fields like health, environmental and industrial engineering and public agencies. These authors have also been very relevant for the STS community in Portugal and supported the linkage between the universities and the national innovation system. In the early 1990s, João Caraça and António Moniz became the national members of the program committee of the 4th Framework Programme of the EC, when social sciences projects were organized in the TSER program (Targeted Socio-Economic Research).

The decade from 1990 to 2000 was characterized by a rapid development of S&T infrastructures and the transfer of innovations from advanced research to the industrial and ICT sectors. On the EU level, Portuguese experts and social scientists were involved in that period in different EC DG XII initiatives on innovation and technology assessment, e.g., European Tech-

nology Assessment Network (ETAN), the MONITOR program, with subprograms like Forecasting and Assessment in Science and Technology (FAST), Strategic Analysis in Science and Technology (SAST), and Support of the Evaluation Activities of R&D Programmes (SPEAR). These initiatives were directly related to TA and were led by Jacques Delors. By then, Delors was President of the European Commission and had established a "Cellule de Prospective" which provided policy advice on innovation and foresight topics, and contributed to the design of research programs (cf. Endo 1994; Ross 1993). As the authors of the ERAWATCH report on Portugal underline, "the Portuguese research and development (R&D) situation changed rapidly in the second half of the 2000-2009 decade, with the GERD/GDP ratio peaking at a historical high of 1.64% in 2009" (Godinho/Simões 2014, online). The economic crisis from 2008 onwards put an end to the positive innovation system development. Despite the changes in the S&T system, R&D governance is still marked by a high degree of centralization, through fund allocation and political coordination. "The formal structures for hearing the main stakeholders have not been used often" (Godinho/Simões 2014, online). A slight change is the fact that the private sector invested significantly more on R&D in recent years (cf. Boavida/Moniz 2012).

It is also important to underline that there was one mixed commission at parliament involving experts and representatives of the public who debated the coincineration technology issue (Matias 2008). This was probably the most important and therefore paradigmatic case in the late 1990s of such a mixed commission at parliament. Although unique in terms of parliamentary debate, it contributed to the awareness of risk issues and the need of independent scientific advice. In fact, risk, health, and environment issues have since then become an "emerging theme, both echoed and driven by the media, [which] reflects social concerns about decision making on matters of urban and rural land development, public health safeguards and environmental protection" (Alves 2011, p. 11). The mere involvement of experts, however, was not enough to fulfill the task of TA, as the Portuguese MASIS report suggests when it underlines that "visible differences between different scientists create a public perception of uncertainty and controversy, although these are intrinsic to science and scientific advice. This has particularly happened in the case of health issues (the recent H1N1 pandemic threat), environmental risks (the co-incineration government policy) and the management of land development (the implication of government decision on where to build the Lisbon airport or the third bridge over the Tagus)" (Alves 2011, p. 11).

In their report for ERAWATCH, the authors made the following statements: "a general criticism made of policy design and implementation in Portugal in recent years is the insufficient involvement of stakeholders in such processes. Formal mechanisms for participatory involvement have not been set up or have had a limited practical role. Furthermore, the lack of a sound public opinion basis and of stakeholder consultation significantly hinders the accumulation of consistency in learning and policy. Research policy is no exception to this state of affairs." (Godinho/Simões 2014, online)

Furthermore, the lack of relations between the national S&T system and economic structures is a marked weakness of the Portuguese innovation system (Henriques 2013, p. 270; Laranja 2012, p. 660). The academic side, regarding itself as the primary source of innovation (e.g., academia, national laboratories, larger research institutes) does not see its duty of innovation transfer, and the industrial side, with almost no tradition of joint projects, is presuming that academics are developing technologies not suited to their needs and the demands of the national economy (Moniz 2012a, p. 185). As a matter of fact, there is almost no dialogue. But there is also a weak relation between these structures (S&T and industry) and the policy governance. The Portuguese PACITA country report mentions that "the relatively limited interaction among different ministries results in science policy being potentially inward-looking rather than aimed at supporting the overall advance of the society, both in terms of innovation and relative to broader issues" (Almeida 2013, p. 8).

4 Current Opportunities and Steps Towards the Institutionalization of TA

The PhD program on "Technology Assessment"

There is a very small STS community in Portugal, but a very large one on innovation studies (mostly economists). The *PhD program on Technology Assessment* is providing competence in both fields. It is the only one that offers a degree in TA. This program was proposed by the Universidade Nova de Lisboa (UNL) and started in 2009/2010, aiming to prepare highly skilled researchers and decision-making consultants who will be involved in the policy processes for technology options, which are expected to become critical in the short and medium term. The proposal was made by social scientists at the Faculty of Sciences and Technology of that university (UNL), but natural scientists and engineers were also associated (Moniz 2012b). A recent study on TA education in Portugal mentioned that "one can say that in Portugal, TA is still without critical mass of researchers, although its political importance is growing very fast and the expectations towards TA seem clearly expressed" (Moniz/Grunwald 2009, p. 20). The TA community is already involved in the reconstruction of the national innovation system (NIS), and it is prepared to advise on policy making. Most researchers are already involved in the larger R&D centers and laboratories (CES, CIES, CESNOVA, INSA, ITQB), participate in several national and international research projects, and have been involved in policy advice studies provided by those centers to several ministries in the field of innovation and science policies.

There are around 20 research projects under development, and the first group of theses on TA was presented for public discussion in the frame of the PhD program on TA at Universidade Nova de Lisboa (UNL) in 2011. Until 2009 (when the PhD program started) there were still few researchers in this field. Five years later one can already talk about a "critical mass" of TA researchers. Almost 40 candidates were enrolled in this advanced level of studies. The knowledge fields in the program cover topics from health TA studies, towards mobility and transport, brain-computer interfaces, innovation and STS, and cloud computing (Baumann 2013; Boavida 2011; Maia 2011, Velloso 2012).

The National TA network GrEAT

The *national TA network* GrEAT was launched by the group of experts connected with the PhD program on TA. This group established regular contacts with other STS experts in Portugal and with the parliament. The scientific events of the PhD program were also disseminated through this network, and the topics discussed there were not exclusive to the academic sphere. In fact, there are several problem-oriented research projects ongoing. This interdisciplinary "research community" is offering its advice through GrEAT and demanding a TA-type interface between parliament and science.

Parliament is playing a strong role in public life, although it remains weak when dealing with S&T issues. There is a lack of S&T competence among the MPs, and this goes together with little interest in these matters. The younger generation of MPs seems to be more engaged and interested. Attempts have been made by parliamentary entrepreneurs from different party groups to support TA since 2010. These people, who include J. Ribeiro e Castro, Gabriela Canavilhas, António J. Seguro, Rui P. Duarte, Luis Fazenda, Isilda Aguincha, and Rita Rato, also strive for PTA. In recent years parliament has approved the intention to establish a TA unit.[9] The Parliamentary Committee on Education, Science, and Culture (CECC) is the one that has been in charge of the organization of a possible TA unit at parliament since 2012.

This committee was contacted by the Portuguese PACITA partner Mara Almeida, and in April 2012 she presented a report where such a unit was proposed (Audição Parlamentar Nº 47-CECC-XII). On February 6, 2012, the committee approved the report and nominated a rapporteur for parliamentary technology assessment (Rui Santos). The national TA network GrEAT was not involved in this activity. By July 12, 2012, the management board of parliament determined that such unit would not receive financial support from the parliament itself for two

possible reasons: because of a lack of financial resources in the context of austerity or because there were no precedents for the type of unit proposed within the organizational structure of parliament. This blocked the process at least temporarily. Meanwhile GrEAT became involved, aiming to help breaking the deadlock.

The first contacts of GrEAT with different party groups at parliament started in early 2010 (in January with meetings with MPs and European TA experts). Later, several MPs representing the spectrum of political parties in parliament also took part in conferences organized together with the PhD program on TA or participated in initiatives of the PACITA project in Portugal. Although these activities were running in parallel, some sort of synergy was missing between the national TA network and the PACITA project. The most support was received from ITAS, which hosted several PhD students and sent experts to participate in the PhD program events. Since 2010 GrEAT has established four permanent working groups[10] and published the results of several research projects. The most important deliverable of GrEAT has been the *Tópicos* leaflets presenting research results envisaging communication with the wider public. Ten *Tópicos*[11] have been published so far and sent to parliament and other governance institutions.

In 2013 GrEAT was accepted as an EPTA observer institution. In its current work, this national TA network is taking part in the organization of public events that are part of the PhD program on TA, is providing information about OTA, EPTA, and STOA studies,[12] and has proposed the creation of a virtual library on TA at parliament, which could be managed by parliament's Technical Information unit under collaboration with GrEAT.

Furthermore it supports the preparation of options regarding how to establish a parliamentary TA unit in Portugal. During 2014, a series of hearings was held on the organization of a TA unit and PTA functions in general, organized by the above-mentioned parliamentary committee – CECC.[13] Several proposals are currently (December 2014) under discussion in parliament. Moreover, GrEAT is working to overcome the hurdles at parliament that blocked the emergence of a TA unit.

Besides the involvement of GrEAT at the level of the national parliament, contacts have been made with the Azorean Regional Parliament that may lead to further advice on PTA in the regional parliament. Issues on energy and sustainability are of major interest in the autonomous region.

In conclusion, TA activities in Portugal are grounded in international cooperation and in expanding scientific expertise through the PhD program at the UNL (in cooperation with ITAS-KIT). The PACITA project organized two national workshops in Portugal (2012), the second parliamentary debate on "*Strengthening Technology Assessment for Policy-Making*" (April 7–8, 2014) in the Portuguese Parliament, the first PACITA practitioners meeting on "Selecting the theme" (September 19–21, 2012 in Lisbon), and a policy hearing involving the Future Panel on Public Health Genomics (Lisbon, January 18, 2014). Both streams of activities increased the opportunities for establishing parliamentary TA in Portugal.

5 Conclusion: Two Countries Ready for Good Old TA

The institutional structure of the science, technology and innovation policy field offers different potential "docking stations" for TA in Spain as well as in Portugal. At present, one promising option in Spain is to attach TA capacities to the Advisory Council for Science, Technology and Innovation. This way, TA could serve Parliament and the Executive – or in other terms: all parties. In Portugal the option to attach TA capacities to the Parliamentary Committee on Education, Science and Culture currently appears as the most promising one.

The case of the successful institutionalization of TA at the Catalonian regional Parliament in 2008 has shown the importance of the scientific community being committed to TA and building up pressure on the parliamentary system. At the national level, the intention and offer of COSCE to deliver TA to the Parliament has not reached its aim. It needs to be emphasized that TA is not the voice of science, but a type of

scientific analysis taking into account multiple perspectives, unintended side effects, and systemic effects of sociotechnical dynamics able to come up eventually with sound options for politics. Maybe a common effort of those scientific communities in Spain that are particularly relevant to delivering TA (e.g., innovation studies, STS studies, policy and governance studies, sustainability research) would be worth another try. In the case of Portugal, we see the GrEAT network as an attempt of the members of the relevant scientific communities to demonstrate that there are TA capacities on which to rely when institutionalizing PTA.

In Spain there were several failed attempts to establish TA at the central state level before the most developed region in economic terms, Catalonia, took the lead. In Portugal the current activities at the national parliament have raised awareness of the potential of TA at the regional parliaments in the Azores and Madeira (in particular the Azores). If the institutionalization at the central state level does not succeed, it may well be that we will see TA at the regional level first. However, the significance of the Azores and Madeira for the Portuguese innovation system is limited.

It has to be further stressed that the European context has been of great importance for the institutionalization of PTA in European countries from the beginning. The introduction of democratic innovations often goes together with a close look at foreign experiences and best practices abroad. Exchanging ideas and learning from the experiences of others require common projects and community building. For national TA communities (in a broad sense) it is important to be involved in European research projects like ETAN, TAMI, EUROPTA, and PACITA and in international community building activities, namely EPTA. While CAPCIT is a member of EPTA, and GrEAT has the status of observer at EPTA, there is no institution or network representing the overall Spanish TA community. International projects and networks in this field in which Portugal and Spain participate are also important vehicles for raising both the attractiveness of TA research in these countries and the awareness of politicians for TA as an instance of democratic innovation.

The perspective of "monitory democracy" should allow politicians to see TA as a democratic innovation to support decision making, but also as a policy-scrutinizing mechanisms, able to increase accountability and responsiveness of the political system regarding its innovation and environmental policies. This might be particularly appealing in countries where civil society puts pressure on the political system to introduce innovations in terms of participation, accountability, and responsiveness. Comparing the protest movements which emerged during the economic crisis and the activities they have brought about, steps towards a monitory democracy are more apparent in Spain, although there are also social movements in Portugal demanding a change in innovation policy with regard to controversial technologies. A proper understanding of monitory democracy has to take into account that citizens' demands for participation do not always have to be translated into a demand for direct participation in decision making. As explained above, political innovations putting forward transparency, accountability and control are an important aspect of a monitory democracy. "Good old TA" can fulfill its purpose in these circumstances as long as its results are open for public debate and as long as the resonance from the study results can be traced in political debates. Once this type of TA has been established and has proved worthwhile, the demand from civil society and politics will indicate how far new forms of participatory TA are additionally required.

Notes

1) We agree with most of the conceptual framing of PTA as presented in Ganzevles/van Est (2012, pp. 18–27; pp. 184–220). A difference is, however, that we stress the importance of the public sphere and the embedding of TA and PTA in the context of changes in Western representative democracies, especially with regard to new scrutinizing mechanisms.
2) This view is confirmed by recent research about parliaments as communication space (cf. Schulz/Wirsching 2012, pp. 12–15; Patzelt 2012, p. 45).
3) Not to forget, however, the terrorism of the Basque ETA separatists and a failed coup d'état in 1981 led by Antonio Tejero – 23-F.

4) We won't go further into the criticism of the current government's policy in this field (inter alia: linear understanding of innovation processes, delays in the constitution of a Spanish Research Agency, funds not provided for "grand-challenge research", dismissal of scientific personnel, brain drain).
5) It is no exception that an innovation can be attached to one or the other institution depending on the forces in a political system. E-petitions in Great Britain for instance, again a democratic innovation, were introduced first as a service of the Scottish Parliament, and then at the state level as a service of the Prime minister (cf. Riehm et al. 2014).
6) GEBEI – Portuguese Office for Basic Studies on Industrial Economy, Ministry of Finance and Planning.
7) The PEDIP program to support innovation in industry mobilized a wide capacity for assessment studies and services oriented towards application of new and emergent technologies in the productive sector and support services, as new forms of consulting competence for technology evaluation. This governmental program had the financial support of the European structural funds and was started in 1988 (Council Regulation No 2053/88 of June 24, 1988). It lasted until 1996.
8) Mainly from the Institute for Economics and Management (Technical University of Lisbon), the Social Studies Centre (University of Coimbra), Faculty of Economics of University of Porto, Faculty of Sciences and Technology (University Nova Lisbon).
9) Resolution of the Portuguese parliament number 60/2009 of July 10, 2009.
10) WG 1 – Health Technology Assessment; WG 2 – Indicators of TA; WG 3 – Transport and Mobility; WG 4 – Foresight Analysis
11) https://avaliacaotecnologia.wordpress.com/topicos/
12) https://avaliacaotecnologia.wordpress.com/publicacoes/publicacoes-do-great/#
13) The hearing with representatives of the national TA network (Audição Parlamentar Nº 162-CECC-XII) is available at http://www.parlamento.pt/ActividadeParlamentar/Paginas/DetalheAudicao.aspx?BID=97045. Besides the MP that belongs to the parliamentary committee – CECC, the present members include GrEAT (e.g., A. Moniz and L. Vasconcelos), J. Caraça (from the Gulbenkian Foundation), V.C. Simões (Portuguese report coordinator of ERAWatch), M. Almeida (Portuguese partner of PACITA project), and M. Heitor (former secretary of state of Science). All of these hearings are available at the parliament webpage.

References

Almeida, M., 2013: Country Report-Portugal. PACITA Report Task 4.1, ITQB

Alves, C.C., 2011: Monitoring Policy and Research Activities on Science in Society in Europe (MASIS). National Report, Portugal, Copenhagen, COWI/MASIS

Andradas, C., 2012: Hacia un parlamento con criterios científicos. In: SEBBM 174 (2012), p. 19

Baumann, M., 2013: A Constructive Technology Assessment of Stationary Energy Storage Systems: Prospective Life Cycle Orientated Analysis. IET Working Papers Series, WPS01/2013

Boavida, N., 2011: Decision Making Processes Based on Innovation Indicators: Which Implications for Technology Assessment? In: Enterprise and Work Innovation Studies 7 (2011), pp. 33–55

Boavida, N.; Moniz, A.B., 2012: Research and Development Expenditure in the Business Sector as Indicator of Knowledge Economy: The Portuguese Experience. IET Working Papers Series, WPS04/2012

Böhle, K., 2003: Spain – Technological Foresight Programme (OPTI). FISTERA WP 1 – Review and Analysis of National Foresight. D1.1 ES – CASE STUDY. Karlsruhe; http://www.itas.kit.edu/downloads/projekt/projekt_rade02_fistera_d1.1es-0304.pdf (download 26.1.15)

Bütschi, D., Carius, R.; Decker, M. et al., 2004: The Practice of TA. Science, Interaction and Communication. In: Decker, M.; Ladikas, M. (eds.): Bridges Between Science, Society and Policy: Technology Assessment – Methods and Impacts. Berlin, pp. 13–55

Cotec – Fundación cotec para la innovación tecnológica, 2013: Informe cotec 2013. Tecnología e innovación en España. Madrid

Cruz-Castro, L.; Sanz-Menéndez, L., 2005: Politics and Institutions: European Parliamentary Technology Assessment. In: Technology Forecasting & Social Change 72 (2005), pp. 429–448

CSIC – Consejo Superior de Investigaciones Científicas (ed.), 2008: ¿Hacia dónde va la política científica (y tecnológica) en España? Madrid

Cuevas Badallo, A.; López Cerezo, J.A., 2009: Ciencia, tecnología y sociedad en la España del siglo XXI. In: RIPS 8/1 (2009), pp. 37–49

Dalton, R.J.; Scarrow, S.E.; Cain, B.E., 2003: Democracy Transformed? Expanding Political Opportunities in Advanced Industrial Democracies. Irvine; http://escholarship.org/uc/item/9tg922hv (download 15.5.12)

Domínguez García, F., 2012: CAPCIT: The Advisory Board of the Parliament of Catalonia for Science and

technology. In: Contributions to Science 8/2 (2012), pp. 131–135

EEA – European Environmental Agency, 2011: BLOSSOM — Bridging Long-term Scenario and Strategy Analysis: Organisation and Methods. EEA Technical report No 5/2011, Annex 10 — Spain country case study. Copenhagen; http://www.eea.europa.eu/publications/blossom/annex-10-2014-spain-country (download 26.1.15)

Endo, K., 1994: The Principle of Subsidiarity: From Johannes Althusius to Jacques Delors: In: Hokkaido University Collection of Scholarly and Academic Papers 44/6 (1994), pp. 553–652

Enzing, C.; Deuten, J.; Rijnders-Nagle, M. et al., 2012: Technology Across Borders. Exploring Perspectives for Pan-European Parliamentary Technology Assessment. STOA IP/A/STOA/FWC/2008-096/LOT8/C1. Brussels

ERAC – European Research and Innovation Area Committee, 2014: Peer Review of Spanish Research and Innovation System. Brussels

Eurostat, 2014: Unemployment Statistics; http://epp.eurostat.ec.europa.eu/statistics_explained/index.php/Unemployment_statistics (download 19.11.14)

Feenstra, R.A.; Keane, J., 2014: Politics in Spain: A Case of Monitory Democracy. In: VOLUNTAS: International Journal of Voluntary and Nonprofit Organizations, Online First, pp. 1–19

Fernández-Esquinas, M., 2011: Evaluación y política científica en España: el origen y la implantación de las prácticas de evaluación científica en el sistema público de I+D (1975-1994). Manuscript; http://works.bepress.com/manuel_fernandez_esquinas/36

Fernández-Zubieta, A., 2014: ERAWATCH Country Reports 2013: Spain. JRC scientific and policy reports. Report EUR 26284 EN. Luxembourg

Font, J.; Méndez, M., 2008: La participación política en España. In: Jiménez de Parga, M.; Vallespín, F. (eds.): España Siglo XXI. La Política. Madrid, pp. 519–549

Freire, A.; Araújo, A. de; Leston-Bandeira, C. et al., 2002: O Parlamento Português: uma reforma necessária. Lisbon

Friedel, A., 2010: Politische Führung im Staat der Autonomen Gemeinschaften: Spanien. In: Sebaldt, M.; Gast, H. (eds.): Politische Führung in westlichen Regierungssystemen. Wiesbaden, pp. 121–147

Ganzevles, J.; van Est, R. (eds.), 2012: TA Practices in Europe. EPTA-PACITA Deliverable 2.2.

Godinho, M.M.; Simões, V.C., 2014: ERAWATCH Country Fiche. COUNTRY | Portugal; http://erawatch.jrc.ec.europa.eu/erawatch/opencms/system/modules/com.everis.erawatch.template/pages/exportTypesToHtml.jsp?contentid=8720bca9-7d1c-11df-b939-53862385bcfa&country=Portugal&option=PDF (download 26.1.15)

Gómez Fortes, B.; Palacios Brihuega, I., 2012: Testing the Quality of Democracy: The Case of Spain. In: European Political Science 11 (2012), pp. 492–508

Gómez González, F.J.; Durlan, C.; Cáceres Gómez, S. et al., 2014: El reto de la Evaluación del Impacto Social de la Tecnología en España. In: Política y Sociedad 51/2 (2014), pp. 447–480

Gonçalves, F.; Caraça, J., 1987: Towards Technology Assessment in Portugal. In: de Hoo S.C., Smits R.E.H.M., Petrella R. (eds.): Technological Assessment – An opportunity for Europe. The Hague, pp. 1–8

Guerrero Salom, E., 2005: Reformas para revitalizer el parlamento español. Madrid

Hennen, L.; Ladikas, M., 2009: Embedding Society in European Science and Technology Advice. In: Ladikas, M. (ed.): Embedding Society in Science & Technology Policy: European and Chinese Perspectives. Luxembourg, pp. 39–64

Hennen, L.; Nierling, L., 2014: A Next Wave of Technology Assessment? Barriers and Opportunities for Establishing TA in Seven European Countries. In: Science and Public Policy 41/3 (2014), pp. 1–15

Henriques, L. (coord.), 2013: Diagnóstico do Sistema de Investigação e Inovação: desafios, forças e fraquezas rumo a 2020. Lisboa

Jiménez Sánchez, M., 2011: La normalización de la protesta. El caso de las manifestaciones en España (1980–2008). Madrid

Juliá, S., 2004: Historias de las dos Españas. Madrid

Keane, J., 2009a: The Life and Death of Democracy. London; http://www.thelifeanddeathofdemocracy.org/resources/excerpt/jkeane_life_and_death_democracy_intro.pdf (download 20.11.14)

Keane, J., 2009b: Monitory Democracy and Media-saturated Societies. In: Griffith Review 24 (2009); http://griffithreview.com/images/stories/edition_articles/ed24_pdfs/keane_ed24.pdf (download 20.11.14)

Kühn, A., 2012: Kampf um die Vergangenheit als Kampf um die Gegenwart: Die Wiederkehr der "zwei Spanien". Baden-Baden

Laranja, M., 2012: Network Governance of Innovation Policies: The Technological Plan in Portugal. In: Science and Public Policy 39/5 (2012), pp. 655–668

Leston-Bandeira, C., 1999: The Role of the Portuguese Parliament Based on a Case Study: The Dis-

cussion of the Budget. In: The Journal of Legislative Studies 5/2 (1999), pp. 46–73

Leston-Bandeira, C., 2004: From Legislation to Legitimation. The Role of the Portuguese Parliament. London

López Cerezo, J.A.; Méndez Sanz, J.A.; Todt, O., 1998: Participación Pública en Política Tecnológica. Problemas y Perspectivas. In: Revista Arbor CLIX 627 (1998), pp. 279–308

Maia, M.J., 2011: Decision-making Process in Radiology: The Magnetic Resonance Example in the TA Context. In: Enterprise and Work Innovation Studies 7 (2011), pp. 75–101

Matias, M., 2008: Quantas partes fazem um todo? A saúde como factor de controvérsia científica no seio dos conflitos ambientais em Portugal: O caso de Souselas. In: Arriscado Nunes, J.; Roque, R. (eds.): Objectos impuros: Experiências em estudos sociais da ciência. Porto, pp. 303–326

Merkel, W., 2008: Democratic Innovation: Theoretical and Practical Challenges of Evaluation; http://www.wzb.eu/de/forschung/wandel-politischer-systeme/demokratie-und-demokratisierung/projekte/democratic-innovation-theoretica (download 26.1.15)

Moniz, A., 2012a: Avaliação participativa de tecnologia e sustentabilidade organizacional (Participative Technology Assessment and Organisational Sustainability). In: Domingues, I. (ed.): Organizações: Controlo e sustentabilidade (Organisations: Control and sustainability). Famalicão, pp. 177–193

Moniz, A., 2012b: Designing a Technology Assessment Post-graduation Programme: Experiences, Limits and Needs. In: Dusseldorp, M.; Beecroft, R. (eds.): Technikfolgen abschätzen lehren. Bildungspotenziale transdisziplinärer Methoden. Wiesbaden, pp. 357–370

Moniz, A.; Grunwald, A., 2009: Recent Experiences and Emerging Cooperation Schemes on TA and Education: An Insight into Cases in Portugal and Germany. In: Technikfolgenabschätzung – Theorie und Praxis 18/3 (2009), pp. 17–24

Nohlen, D., 2012: Politische Kultur in Spanien und Deutschland. In: Grasnick, J.; Walter, K. (eds.): Politik in Nordamerika und Europa. Wiesbaden, pp. 142–161

O'Reilly, P.; Adam, F.; López, B. et al., 2012: Parliamentary TA in Catalonia (Spain). In: Ganzevles, J.; van Est, R. (eds.): TA Practices in Europe. EPTA-PACITA Deliverable 2.2., pp. 46–54

OECD – Organisation for Economic Co-operation and Development, 2014: OECD Economic Surveys: Spain, OECD Publishing; http://dx.doi.org/10.1787/eco_surveys-esp-2014-en (download 26.1.15)

Oñate, P., 2013: La movilización ciudadana en España en los albores del siglo XXI: una contextualización para el debate. In: Revista Española de Ciencia Política 33 (2013), pp. 31–55

Patzelt, W.J., 2012: Das Parlament als Kommunikationsraum. Funktionslogik und analytische Kategorien. Schulz, A.; Wirsching, A. (eds.): Parlamentarische Kulturen in Europa: das Parlament als Kommunikationsraum. Düsseldorf, pp. 45–74

Pettit, P., 1999: Republican Freedom and Contestatory Democracy. In: Shapiro, I.; Hacker-Cordón, C. (eds.): Democracy's value. Cambridge, pp. 163–191

Quintanilla, M.A. (coord.), 1989: Evaluación parlamentaria de las opciones científicas y tecnológicas. Seminario Internacional. Madrid

Revuelta, G., 2011: Monitoring Policy and Research Activities on Science in Society in Europe (MASIS). National Report, SPAIN (DG Research). Lyngby

Riehm, U.; Böhle, K.; Lindner, R., 2014: Electronic Petitioning and Modernization of Petitioning Systems in Europe. Berlin

Ross, G., 1993: Policy Development and the Cabinet System in the Delors' Commissions, In: UNSPECIFIED, Washington, DC. (Unpublished); http://aei.pitt.edu/7234/ (download 9.1.15)

Sanz Menéndez, L., 1995: Research Actors and the State: Research Evaluation and Evaluation of Science and Technology Policies in Spain. In: Research Evaluation 5/1 (1995), pp. 79–88

Sanz Menéndez, L.; Goicolea Ruigomez, J., 1987: Technology Assessment and Scientific Policy in Spain. In: de Hoo S.C., Smits R.E.H.M., Petrella R. (eds.): Technology Assessment an Opportunity for Europe. The Hague, pp. 1–26; i–ii; Appendix 1-2

Scharpf, F.W., 1997: Economic Integration, Democracy and the Welfare State. In: Journal of European Public Policy 4/1 (1997), pp. 18–36; http://dx.doi.org/10.1080/135017697344217 (download 26.1.15)

Schulz, A.; Wirsching, A., 2012: Parlamentarische Kulturen in Europa – das Parlament als Kommunikationsraum. In: Schulz, A.; Wirsching, A. (eds.): Parlamentarische Kulturen in Europa: Das Parlament als Kommunikationsraum. Düsseldorf, pp. 11–28

Teorell, J., 2006: Political Participation and Three Theories of Democracy: A Research Inventory and Agenda. In: European Journal of Political Research 45/5 (2006), pp. 787–810; http://dx.doi.org/10.1111/j.1475-6765.2006.00636.x (download 26.1.15)

Todt, O., 1999: Social Decision Making on Technology and the Environment in Spain. In: Technology in Society 21 (1999), pp. 201–216

Torcal, M.; Montero, J.R.; Teorell, J., 2006: La participación política en España. Modos y niveles en perspectiva comparada. In: Revista de Estudios Políticos (nueva época) 132 (2006), pp. 7–41

van Est, R.; Brom, F., 2012: Technology Assessment, Analytic and Democratic Practice. In: Chadwick, R.; Callahan, D.; Singer, P. (eds.): Encyclopedia of Applied Ethics, pp. 306–320

Varela, J., 2004: Asesoramiento científico a los palamentarios. In: EL PAÍS, 21.4.2004, p. 38

Velloso, G., 2012: Bridging Present and Future of Brain-Computer Interfaces: An Assessment of Impacts, IET Working Papers Series, WPS09/2012

Contact

Dipl.-Soz. Knud Böhle
Institute for Technology Assessment and Systems Analysis (ITAS)
Karlsruhe Institute of Technolgy (KIT)
Karlstraße 11, 76133 Karlsruhe, Germany
Phone: +49 721 608-22989
Email: knud.boehle@kit.edu

« »

Is There a Chance for TA?

Reflections on the Perspectives for TA in Eastern/Central Europe

by Edgaras Leichteris, Knowledge Economy Forum, Vilnius, Lithuania

Technology assessment has been widely unknown in many Central and Eastern European countries until now. This paper is a reflection about the possible roles and potential of TA in some of these countries (Bulgaria, The Czech Republic, Hungary, and Lithuania) based on discussions as well as the activities in the course of the PACITA project. The article views the current situation against the background of the historical heritage such as the Soviet Regime as well as compares the specific political culture and climate of these countries with those in some of the Western European countries in which technology assessment units were introduced in the 1970s and 1980s. So far, TA is only regarded as an unrecognized need by many in Eastern and Central Europe: often a lack of understanding of the TA concept by decision makers, the inflexibility of the current system, the danger of a politicization of such attempts, the concentration of decisions in the government rather than parliament as well as problems with financing and a lack of TA-trained human resources are named as reasons for this state of affairs. For the future, two perspectives are proposed: First to focus on the important role of the EU with regard to its financial power as well as the mutual learning occurring across national contexts. Second, a transition strategy for TA in these countries should be elaborated to support the national TA initiatives which have started in the meantime. Different roles for TA are proposed here which rely on national activities but also on an international TA network accompanying the future development of TA in these countries.

1 Introduction

Technology assessment (TA) and parliamentary technology assessment (PTA) are still new concepts in most of the Central and Eastern Eu-

ropean countries – although first efforts have already been made in some countries, e.g., the participation in EU-funded TA projects or experience with TA-related activities such as technology foresight. The EU-funded project PACITA (Parliaments and Civil Society in Technology Assessment) tried to explore the main barriers to and opportunities for TA in several European countries with the aim of expanding the current TA landscape to Central and Eastern Europe. The present paper provides an "outsider's" look, namely by a PACITA project partner who was introduced to the concept of TA for the first time by the PACITA project. The reflections presented in the following pages are based on the learning process the author underwent in the course of PACITA, i.e., discussions on the TA concept with colleagues from established (Western) TA institutions, the outcomes of the TA activities within the PACITA project, discussions with his "fellow non-PTA" colleagues, and last but not least the impressions and insights gained from the author's efforts to initiate a TA debate among researchers, policy makers, and civil society organizations in Lithuania.

From this perspective it appears that for the Central and Eastern European countries involved in PACITA (Czech Republic, Bulgaria, Hungary, Lithuania) the findings of the project suggest that there are much stronger obstacles to the introduction of TA as a concept of independent and public policy advice than can be overcome by just transferring knowledge on methodologies and concepts from "PTA" to "non-PTA" countries. These obstacles are rooted to a great part in the remnants of influence of the former Soviet system on research and innovation and in the current struggles to reform the R&D system, especially in the context of the financial crisis. Melnikas et al. (2011) state that in Central and Eastern Europe the main barriers to starting political innovations and to strengthening the role of civil society in the democratic system lie in the fact that most of these countries try to adopt the Western model of democracy in the hostile environment set up under the influence of the former Soviet Union.

2 An Unfavorable Environment for TA: Old Structures Struggling with New Problems

Is there a real chance to establish TA in the Central and Eastern European countries? This is the first question I raise with a view to the history of TA and to the arguments prevalent in the process of establishing TA in European countries during the 1970s and 1980s. Hennen and Nierling (2014) have narrowed down factors for the establishment of TA in "old" countries to four main factors: (a) highly developed, differentiated, and governmentally supported R&D system; (b) problem-oriented research and self-reflective science in the academic sector; (c) critical public interest in issues from science and technology (S&T); and (d) strong and explicit demand from policy makers for scientific knowledge and methods to deal with public concerns.

For the first two factors – a highly developed and Government-supported R&D system and problem-oriented research in the academic sector – the situation in the Central and Eastern European countries nowadays differs quite clearly from that in Western TA history. While Hungary and the Czech Republic have some experience in TA-like activities (especially in technological foresight), Lithuania and Bulgaria are just making their first transitional steps towards problem-oriented and interdisciplinary research. In Lithuania, problem-oriented research is strongly supported by the government in the field of research and innovation policy. This often relies, however, on the consultancy work done by private companies and, furthermore, is usually initiated by measures of the European Union or the OECD (Technopolis group 2013; Valinčius 2013; Reid et al. 2012).[1]

In the current situation, the R&D system in Central and Eastern European countries is in need of huge investments into infrastructure. R&D policies respond to this demand and are aimed at supporting investments through various "catching up strategies," often financed by European funds like the science and business cooperation "valleys" programs in Lithuania (LMES 2014), the National Research Infrastructure Survey and Roadmap in Hungary (HNIO 2014), or the National Development Program Bulgaria 2020 (BMOF 2014).

As those countries do not have much experience in investing into big R&D infrastructure projects, the effectiveness of such investments is low, the return on investments is unknown, and their future is uncertain. With a view to worldwide trends, Central and Eastern European countries try to catch up with innovation, thus competing with each other in similar areas (nanotechnology, biotechnology, information and communication technologies, renewable energy, etc.) without having real capacities to establish themselves as strong players in these fields of technology. This reveals the gap in strategic technological priorities between Western and Eastern European countries: Western countries rely on already existing technologies, practices, institutes, research, and businesses. Central and Eastern countries are often victims of wishful thinking by their politicians and still need to find their way to differentiate themselves from other countries and to stay competitive on the European or global "playing field".

On a general level, public interest in S&T in most European countries is low, with an average of 40 % of respondents interested in S&T (EC 2013). In the Central and Eastern European countries analyzed here, the figures are even below the European average (see table 1):

Table 1: Public interest towards S&T in Central and Eastern European countries analyzed

Country	*% of people interested in science and technology issues*
EU	40 %
Lithuania	33 %
Czech Republic	29 %
Bulgaria	25 %
Hungary	25 %

Source: EC 2013, p. 9

However, recent case studies in the named countries have shown that public debates on some controversial issues can become lively and even hot, leading to strong disagreements with official positions of the government. However, such debates are too often the object of changing political tactics and strategies and do not lead to the consistent political uptake of arguments and positions. The Lithuanian debate on building a nuclear power plant (Leichteris/Stumbrytė 2012) can serve as an example here. The fatal accident in the Chernobyl nuclear power plant in 1986 initiated a public debate about the security of the Lithuanian nuclear power plant, which was equipped with a Chernobyl type of reactor. The debate started around "technological" issues but soon developed into a fight for Lithuanian independence because the green movement became a hidden organizational force for much broader civil action. Soon after Lithuania became independent, the "technological issue" became "economical and political": from 2005 to 2012 the Government showed very clear support for the development of a nuclear energy system in Lithuania. Under the pressure from the EU, the old-type Chernobyl power plant was closed, but negotiations to build a new one were started. The public did not follow the negotiations and was disinterested in the decisions until the Fukushima nuclear disaster in 2011. Since one of the main potential builders of a new power plant was the Japanese company Hitachi, the accident in Japan revived the debates over nuclear energy in Lithuania. In a public referendum in 2012, the wave of public disagreement voted against building an nuclear power plant. In Austria during the late 1970s a similar plebiscite triggered a debate over a systematic analysis of technological policies (Nentwich et al. 2012). In Lithuania this was not the case. The political party which agitated the most against nuclear energy later formed the government and now faces a dilemma. On the one hand, there is a clear necessity to have an independent energy system. It is supported by the fear of political influence exerted by Russia (especially in the light of recent Russian military actions in the Ukraine). On the other hand, the main potential strategic partners – Latvia, Poland, and Estonia – have expressed concerns about acting against public opinion. At the moment the arguments in favor of building a nuclear power plant seem to be stronger than the technological controversies over nuclear energy, and connected with this the reluctance to go against public opinion is vanishing. However, the government has now gone for two years without making any decision.

When reflecting on the explicit demand by policy makers for scientific knowledge and methods to deal with public concerns, factors very well-

known from Western European countries also apply to the new democracies in Eastern and Central Europe. In general, politicians are action oriented and need to solve problems as quickly as possible, and their search for knowledge for doing is not for the sake of knowing itself (Bimber 1996). In the Lithuanian context, it is difficult to involve them in activities which are not relevant for their current political agenda or are not being widely debated in the public sphere. And if they are involved, they tend to take shortcuts by using weak evidence, referring to selected experts' opinions, or making their own subjective decisions without having the relevant knowledge. Eastern and Central European policy making, moreover, suffers from traditions which add additional obstacles to the utilization of independent policy advice and transparent deliberation on S&T issues. In both Western and Eastern European countries there is a wide use of experts whose role is to give independent advice on S&T issues and fuel scientific knowledge into policy making. But how those experts are chosen and how their "objectivity" is supported throughout the whole process differs in the Western and Eastern traditions. In Western European countries experts are usually involved by policy makers to legitimize an argument by providing scientific authority. The Eastern tradition of scientific policy consulting was born under the influence of the Soviet political system, where science for a long time served as an instrument supporting political propaganda (i.e., the scientists were not consulted for their expertise, but were ordered to create evidence supporting the Soviet political regime).

This makes science-based policy advice an area that is also regarded with distrust by the general public in Central and Eastern European countries. Whereas the problem in the Western European countries might be the contradictory nature of advice given by different types or groups of experts (expert dilemma), in Central and Eastern European countries it is a general distrust in the independence of scientific advice. On the one hand, independent expertise is desperately needed and demanded, while on the other hand transparent procedures of selecting experts and open processes of policy consulting are lacking. Such structures of democratic processing of scientific knowledge are difficult to establish in a political culture that is still molded by the old system of instrumentalizing science and scientists.

An active civil society embedded in a culture of transparent and open policy making is far from being well developed in the countries under consideration here. According to Transparency International (2014), the "non-PTA" Central and Eastern European countries involved in PACITA (Lithuania, Hungary, Czech Republic, Bulgaria) show a middle level of corruption (scoring from 40–59), while their PTA "twinning partners" in the Western European countries show very low (Denmark, Norway, Switzerland, The Netherlands) or low (Germany, Austria) levels of corruption (scoring from 69–91). In addition, Lithuania struggles with very low levels of civic participation (PVI 2014). Bulgaria's development of a democratic culture suffers from the dominance of politically and governmentally owned NGOs (CSD 2010). Hungary recently started imposing more controls on NGOs and the free media. Therefore it is not only about making policy makers aware of their need to cooperate with scientific experts but also about creating awareness of the need to ensure there are clear, transparent procedures of expert selection. The debates, conflicts, and networks needed for the introduction of TA as a means of achieving public accountability of policy making might themselves function as a good exercise helping these countries to impose bigger changes with regard to structures that allow for public deliberation as a basis for democratic decision making.

Thus, even if Central and Eastern European countries are heading towards institutionalizing TA, there are still big challenges to solve. How can an institution or network of institutions be created which is capable of providing high quality, valid, and credible evidence to policy makers? Representatives of Central and Eastern European countries are often afraid that the process of institutionalization of TA can be undermined by politicians and that, as a consequence, TA can lose its main features – namely objectivity, impartiality and independence – or can be taken over by formal organizations lacking competence on TA.

3 Starting a TA Debate in Lithuania: An Unrecognized Need for TA?

Reflected against what I have learned from guiding a process of introducing the TA concept to relevant actors in Lithuania and according to what I have observed from respective processes in other countries in the course of the PACITA project, there is little evidence that the environment in these countries is as favorable for the institutionalization of TA as it was in other European countries during the 1970s and 1980s.

Evidence from the "old PTA countries" (Ganzevles/van Est 2012; Mintrom 1997; Cruz-Castro/Sanz-Menéndez 2005) shows, that even with a favorable environment most institutions needed "political momentum" and "political entrepreneurs", which currently are not very likely to enter the scene of S&T policy making soon due to the above mentioned problems. And even when they are in place, the road of institutionalization is full of long battles and attempts to gain political influence over the TA institution. By now, we can at best identify what has been coined an "unrecognized need" for TA in interviews in Lithuania (Leichteris/Stumbrytė 2012, p. 203). In the course of the interviews and workshops on TA that have been organized in Lithuania, the debate constantly circled around making the TA concept understandable to politicians and other actors and communicating the usefulness of TA products. Although many of the TA discussants in Lithuania were in favor of independent policy advice and transparent structures of deliberation (as a remedy for the blockades caused by "old thinking" and "old structures"), they could hardly imagine that such initiatives would be prompted by politicians. In turn, the interviewed politicians were rather skeptical about the Lithuanian parliament as a seedbed for evidence-based policy making and expressed disbelief of the effectiveness of a TA unit if it would have been created in the parliament due to its weak role in S&T policy making. Rather, an institution under the government or an independent institution was mentioned as offering a more favorable option, provided that it will be able to concentrate competence from different areas and will be funded accordingly, thus overcoming the problem of capacities scattered across several institutions and authorities.

In Lithuania, it seemed that consensus was reached regarding how to solve these shortcomings by using an innovative TA institutionalization model: This network model of open cooperation among different institutions was supported by NGOs, consultative agencies of the government, and the Lithuanian Academy of Sciences. Later however that model was indirectly opposed by the Lithuanian Science Academy.

The Lithuanian Science Academy followed the model of a Soviet Science Academy for more than 40 years. Although it was formally reformed after independence, the culture, people, traditions, and procedures remained the same. The soviet tradition was based on the imperial Russian model, created in the XVIII century, which unlike its Western counterparts (which acted as institutions of scientific research) was given numerous powers of supervision and control (Vucinich 1956). These powers were even further strengthened during the Soviet period, supported by the utopian vision of a world domination in science and by a centralized system of financing and control instead of methods based on scientific peer reviews and research grants (Graham 1993). When new players emerge in the field (be they private institutes or NGOs, claiming the potential for offering science-based evidence to politicians), a confrontational situation comes to the fore: the old players want to keep their monopoly in providing policy advice and are reluctant to open the system to the public.[2]

The recently discussed draft of the Law on Science and Education now foresees assigning an exclusive, higher advisory role to the Lithuanian Science Academy and the Lithuanian Research Council. According to the proposed changes in the current draft of the law, the Lithuanian Science Academy might be given expert functions for all strategic questions on science and education, whereas the Research council might get the function to evaluate R&D activities. This development does not close the door to the use of the network model, or to having other institutions perform TA in Lithuania, but it might also constitute some additional formal roadblocks. However it may also open the opportunity to have a strong network, based on trust and cooperation, which is capable of identifying policy options,

has clear channels, and is assigned a mandate in the law with regard to how to push things forward on the political agenda.

As Smits et al. (1995) point out the most important attributes of TA are quality, validity, and credibility. Bimber (1996) and Rodemayer et al. (2005) state its "neutral competence", namely the ability to provide unbiased and balanced policy advice. Such features are not created simply by putting them into the law or other regulations. They need to have a favorable political environment, they are harvested slowly during the lifetime of an institution whose sustainability comes from the constant cooperation between different actors.

All in all, the main obstacles to establishing TA in the countries under consideration here are a lack of expertise and understanding of the TA concept by parliamentarians, the inflexibility of the current system that hinders the establishment of new institutional structures, the usual "politicization" of such attempts, the concentration of decisions in the government rather than parliament, the financing issue, and the lack of TA-trained human resources.

4 Europe as a Factor to Keep the TA Process Going

If most of the factors which worked for the "old" countries are not in place for the establishment of TA in Central and Eastern Europe, is it possible to identify new factors which can help institutionalize TA in these countries in a mid-term perspective?

A first, strong factor can probably be attributed to the general European policy and its financing instruments – namely Europe's Horizon 2020 strategy (Horizon 2020 2014) as well as the strategy of smart specialization as a tool for R&D and innovation based on regional growth (McCann/Ortega-Argilés 2013; Wintjes/Hollanders 2011). EU funding given through Horizon 2020 can create synergies with national programs by pushing important issues from the European to the national political agenda which are otherwise not discussed at the national level because of a lack of information or local knowledge. However, the participation of the new member states in EU policy making – especially in the areas connected to science, technology, and innovation – is very weak. Often, they even do not have the capacity to analyze their own R&D and innovation potential and to induce policy actions to improve their competitiveness on their own. In response to this situation, the European Commission started the smart specialization strategy tying the financing from the European Structural Funds to the ability to identify smart specialization priorities. Although TA and smart specialization cannot be easily compared, the debates in the Central and Eastern countries show that TA is often tightly connected to innovation policy (Bulgaria, Czech Republic, Lithuania) and less often with research policy (Hungary). Thus, the smart specialization processes can provide sustainable amounts of money to implement technology-based innovation programs. Further, transparent, well organized and evidence-based debates over smart specialization priorities can clear the road for further debates on the opportunities and risks of specific technologies and innovation paths. The Knowledge Economy Forum, a not for profit organization in Lithuania uniting business companies, research institutes and policy experts and a partner in the PACITA project, was involved in debates on smart specialization priorities from the very beginning and is now planning to initiate a further debate with parliamentarians over the technologies behind those priorities. In the Czech Republic, the Technology Center ASCR (also a PACITA partner) acts as a technology transfer office and can also be one of the implementing bodies for smart specialization strategies. The strong orientation of S&T policy to induce innovation strategies can be used as an entry point for TA to bring in strategic knowledge and help organize a discourse on feasible and sustainable national technology priorities.

A second factor supporting national reflections on TA is the mutual learning induced by European cooperation and exchange. Although many of the experts involved in the national PACITA activities were skeptical about the possibilities to induce institutional structures of knowledge-based policy making, there was a great eagerness to learn about TA methods, to understand developments in other countries, and to initiate transdisciplinary research projects. This is demonstrated

by the very large number of participants and their feedback given in practitioner training workshops and summer schools of the PACITA project. The project created a strong network of a wider European TA community, including related infrastructures such as the European TA portal.[3]

On the one hand, the partners from Central and Eastern Europe contributed to this network by offering their specific perspective to the international TA discourse. On the other hand, they formed a separate unit where they shared problems and experiences from recent developments in S&T policy making and discussed main obstacles and opportunities for establishing TA.

There is some risk that such cooperation will diminish with the end of the PACITA project in the future. These partners are therefore now eagerly looking for opportunities to continue the cooperation in this wider TA network, e.g., by participation in further TA-related EU-funded projects.

5 An Incremental Way Forward: A Transitional Function for TA

Discussions on ways to achieve an institutionalization of TA in Central and Eastern European countries revealed different strategies depending on each political context. When there is already some "research based TA" experience available, such as from strong links with the respective science academy, these activities can naturally serve as a starting point: Colleagues from the Czech Republic and Hungary are inclined to follow that approach. In other countries even the rudimentary practice of TA has to be built up from scratch; in this case, civil society organizations may take the lead. The discussions triggered by PACITA in Lithuania and Bulgaria led to the first steps towards a network-based model characterized by awareness-raising campaigns, proactive approaches by potential candidates for institutionalization, and strong cooperation with national cross-disciplinary organizations like think tanks, analytic centers, and policy institutions (Kozarev 2012; Leichteris/Stumbrytė 2012).

All in all, it appears to be premature for Central and Eastern European countries to simply start discussing different organizational models of TA, be they connected to parliament or government (see van Est et al. in this volume). Thus a pragmatic approach is proposed here: Instead of trying to persuade the parliament or government to establish a TA unit or to foresee a yearly budget and long-term responsibilities, a potential TA "seed bed" institution should concentrate on finding its "first client," be it parliament, the government, a ministry, the Science Academy or even individual politicians. It should start to establish contractual or personal relationships to other organizations, try to deliver high-quality TA products, and showcase their value. The model of implementation that the countries choose is much less important than the transition strategy they develop. Part of such a strategy might be the definition of temporary functions which can be performed in the specific national context and can thus provide a solid basis to institutionalize TA in the future.

Such a transitional strategy of TA can include the following roles:

a) TA as a "content marketer" "selling" science-based evidence,
b) TA as an "eyes opener" of future options,
c) TA as a "lobby organization" to establish knowledge-based decision making,
d) TA as a "knowledge sharer" in an international knowledge exchange network.

TA as a *content marketer* takes into account the existing barriers to establishing a transparent knowledge-based process of advising policy making. It nevertheless tries constantly to feed in knowledge as well as to offer procedures for an open and transparent discourse to policy making within the limits of the available financial and human resources. It can aim at training measures to create TA awareness in policy making by giving profound explanations on policy choices and on the benefits and constrains of debated technologies. It can target the issues which are on the current political agendas. The function will also have its own challenges: It can imply a constant pushing of relevant information to politicians, analyzing why evidence was either not used or was rejected, and then test the process again with other methods or modified content. This function might be called a "stealth" approach where TA methods are used to give evidence on decisions which are already on a short-term political agenda, while

postponing the direct promotion of institutionalization of TA. Content marketing should concentrate on the delivery of high-quality content and thus prepare the ground for an institutionalization initiative by "making advocates" for TA.

TA as an *eyes opener* shall give politicians a glimpse of what is going on at the EU level or in other European countries and will raise awareness of 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 (Ely et al. 2014). That means that TA is a forward looking tool. During the transition period, new countries can concentrate their efforts on pushing some questions which are not seen as being relevant in national parliaments but which are eagerly debated in parliaments of other countries. It should not be overused or lead to the provision of complex research. It should be oriented more to the dissemination of already existing and widely available knowledge beyond a national context.

TA as a *lobby organization* shall aim at building up a coalition of TA practitioners, policy consultants, and research institutes. It does not defend particular interests, but puts issues with medium-term importance on the political agenda that have so far not been taken up. Taking input from the European Agenda as well as support with regard to existing studies and research from a European network will be crucial. Networking shall be used intensively to make personal relationships with policy makers and to form a generally positive public opinion toward evidence-based policy making. If the resources allow for it, policy evaluations can be performed, showing the shortcomings of current policies and providing general recommendations for action.

TA as a *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 countries can afford large-scale research on the impact of technologies developed in their countries on society in general, a more feasible solution in the case of Central and Eastern countries – given their budgetary constraints and undeveloped R&D systems – is to adapt knowledge that already exists in the EU to the local context. Thus, the cross-European cooperation of TA-like institutions, the exchange of information on parliamentary TA issues, and the sharing of research results among TA institutions is important.

All of these transitional functions and roles clearly require an actor or a group of actors equipped with a minimum of institutional support to take up this role. In this respect the discussions and debates initiated by the PACITA project in the Central and Eastern European countries have provided at least the ground for follow-up activities in the above-mentioned sense. Groups connected to the analysis of R&D policy in the Academies of Sciences as now visible in the Czech Republic and Hungary show a growing interest in TA. They may be able to take over this role for a period of time even without stronger support from policy makers. The role can also be taken over by single NGOs or a network of actors interested in TA as was proposed for Bulgaria and Lithuania. In the long term, all these activities will hopefully contribute to the establishment of national coalitions of TA supporters, including national research institutes, NGOs, and business associations. The integration of such actors in a European network seems to be crucial to make initiatives sustainable, not the least by including more national actors in EU-funded TA-related research.

Notes

1) Nearly all initiatives in problem-oriented research for policy consulting are managed by the Ministry of Education and Science of Lithuania and their analytical center MOSTA. However, despite its high ambitions, there is still a missing link between science and the societal and political uptake of scientific knowledge. One interesting example was the preparation of a foresight action called "Learning Lithuania 2030" (MOSTA 2011). The action struggled hard with the transformation of its results into policy making, but ultimately the results were not reflected in the corresponding policy documents. Further, there are some activities to popularize science in society: Some are led by the Lithuanian Academy of Sciences, which coordinates a consortium of universities. Others

are more informally organized as "science popularization networks" consisting of NGOs, youth organizations, and others.

2) The recent organizational evaluation of the Research Council of Lithuania (RCL) renewed the interest of this institution in policy making. One of the main findings of the evaluation's report stated that: "The RCL has a dual role as a funding agency and as a provider of policy advice, but the former dominates the latter and that results in the underutilization of a valuable voice within the national system" (Feely et al. 2014, p. 6; further pp. 20–21). Thus, the RCL might become another important player in science-based policy advice.
3) http://technology-assessment.info/

References

Bimber, B., 1996: The Politics of Expertise in Congress. Albany, NY

BMOF – Bulgarian Ministry of Finance, 2014: National Development Programme: Bulgaria 2020; http://www.minfin.bg/en/page/869 (download 19.12.14)

Cruz-Castro, L.; Sanz-Menéndez, L., 2005: Politics and Institutions: European Parliamentary Technology Assessment. In: Technological Forecasting and Social Change 72/4 (2005), pp. 429–448

CSD – Center for the Study of Democracy, 2010: Civil Society in Bulgaria: Trends and Risks

EC – European Commission, 2013: Responsible Research and Innovation (RRI), Science and Technology: Report, Special Eurobarometer 401; http://ec.europa.eu/public_opinion/archives/ebs/ebs_401_en.pdf (download 22.1.15)

Ely, A.; van Zwanenberg, P.; Stirling, A., 2014: Broadening Out and Opening up Technology Assessment: Approaches to Enhance International Development, Co-ordination and Democratisation. In: Research Policy 43/3 (2014), pp. 505–518

Feely, O.; Jonasson, H.; Kehm, B.M. et al., 2014: Organisational Evaluation of the Research Council of Lithuania (RCL): Evaluation Report. European Science Foundation (ESF), pp. 1–55

Ganzevles, J.; van Est, R. (eds.), 2012: TA Practices in Europe Report. PACITA Collaborative Project on Mobilisation and Mutual Learning Actions in European Parliamentary Technology Assessment (FP7)

Graham, L., 1993: Science in Russia and the Soviet Union. Cambridge

Hennen, L.; Nierling, L., 2014: A Next Wave of Technology Assessment? Barriers and Opportunities for Establishing TA in Seven European Countries. In: Science and Public Policy 41/3 (2014), pp. 1–15

HNIO – Hungarian National Innovation Office, 2014: NEKIFUT Project: New Report on the Hungarian Research Infrastructure is Available – Latest Trends, Disciplines, Recommendations; http://www.nih.gov.hu/strategy/news/nekifut-project-new (download 19.12.14)

Horizon 2020, 2014: What is Horizon 2020? http://ec.europa.eu/programmes/horizon2020/en/what-horizon-2020 (download 22.12.14)

Kozarev, V., 2012: Explorative Country Study: Bulgaria. In: Hennen, L.; Nierling, L. (eds.): Expanding the TA-landscape Report. PACITA Collaborative Project on Mobilisation and Mutual Learning Actions in European Parliamentary Technology Assessment (FP7)

Leichteris, E.; Stumbrytė, G., 2012: Explorative Country Study: Lithuania. In: Hennen, L.; Nierling, L. (eds.): Expanding the TA-landscape Report. PACITA Collaborative Project on Mobilisation and Mutual Learning Actions in European Parliamentary Technology Assessment (FP7)

LMES – Lithuanian Ministry of Education and Science, 2014: Integrated Science, Studies and Business Centres (Valleys); http://www.smm.lt/web/en/science1/science_1 (download 19.12.14)

McCann, P.; Ortega-Argiles, R., 2013: Modern Regional Innovation Policy. In: Cambridge Journal of Regions, Economy and Society 6/2 (2013), pp. 187–216

Melnikas, B.; Jakubavicius, A.; Leichteris, E. et al., 2011: Žinių ekonomikos kūrimas: Inovacijų paramos sistema. Vilnius

Mintrom, M., 1997: Policy Entrepreneurs and the Diffusion of Innovation. In: American Journal of Political Science 41/3 (1997), pp. 738–770

MOSTA – Mokslo ir studijų stebėsenos ir analizės centras, 2011: Lietuvos mokslo ir studijų ateities vizija: Mokslioji Lietuva 2030. Vilnius, pp. 1–8

Nentwich, M.; Peissl, W.; Sotoudeh, M., 2012: Parliamentary TA in Austria. In: Ganzevles, J.; van Est, R. (eds.): TA Practices in Europe Report. PACITA Collaborative Project on Mobilisation and Mutual Learning Actions in European Parliamentary Technology Assessment (FP7)

PVI – Pilietinės visuomenės institutas, 2014: Lietuvos visuomenės 2013 m. pilietinės galios indeksas

Reid, A.; Besagirskas, S.; Biekša, M. et al., 2012: A Contribution to Priority Setting for Future Research, Studies and Innovation in Lithuania: Report of an Expert Group to the Ministry of Education and Science

and Ministry of Economy of the Republic of Lithuania. Vilnius, pp. 1–30

Rodemeyer, M.; Sarewitz, D.; Wilsdon, J., 2005: The Future of Technology Assessment. Woodrow Wilson International Center for Scholars

Smits, R.; Leyten, J.; Den Hertog, P., 1995: Technology Assessment and Technology Policy in Europe: New Concepts, New Goals, New Infrastructures. In: Policy Science 28/3 (1995), pp. 271–299

Technopolis Group, 2013: Global Trends and Drivers as Challenges for Lithuanian Research and Innovation Policy. Background Paper to Support the Development of a Smart Specialisation Strategy in Lithuania, pp. 1–4; http://www.mosta.lt/images/Global_trends.pdf (download 22.1.15)

Transparency International, 2014: 2013 Corruption Perceptions Index – Infographics; http://www.transparency.org/cpi2013/infographic (download 6.11.14)

Valinčius, G., 2013: Research Potential in Lithuania: Background Discussion Paper. Vilnius, pp. 1–48

Vucinich, A., 1956: The Soviet Academy of Sciences. Stanford, CA, pp. 1–21

Wintjes, R.; Hollanders, H., 2011: Innovation Pathways and Policy Challenges at the Regional Level: Smart Specialization. United Nations University – Maastricht Economic and Social Research Institute on Innovation and Technology (UNU-MERIT)

Contact

Dr. Edgaras Leichteris
J. Galvydžio g. 5, 08236, Vilnius, Lithuania
Phone: +370 (85) 274 5420
Email: edgaras@zef.lt

« »

Technology Assessment in the USA: Distributed Institutional Governance

by Jathan Sadowski and David H. Guston, Arizona State University

In the US, there is a lack of a centralized technology assessment (TA) capacity, which effectively moves the US back in time, pre-Office of Technology Assessment, when TA functions existed but were so decentralized and varied that they were hardly recognized as such. There is no primary organization, public or private, to innovate new methods, establish best practices, or provide policy guidance. Instead, there are disparate organizations, the connections among which cannot even be called a network. This article will describe three discrete – but at times overlapping, interacting, and complementary – institutional settings where activities one could recognize as TA are occurring: government agencies, non-governmental organizations, and academic research centers. The paper will conclude with a brief discussion of the challenges and roadblocks to institutionalized TA in the US.

1 Introduction

When one thinks of institutionalized technology assessment (TA), whether in the context of the United States or elsewhere, one invariably calls to mind the Office of Technology Assessment (OTA). In service to the US Congress, OTA was the first and largest "parliamentary" TA office. Scholars, journalists, and participants have often written on its history and methods (see Bimber 1996; Guston 2003; Hill 1997; Keiper 2004; Kunkle 1995) – and for good reason, since it marks an important, and still unique, experiment in TA. OTA's origins reach back to the early 1960s[1] when tensions flared between the executive and the congressional branches of the federal government about access to technical and scientific advice (Bimber/Guston 1995). After much debate in Congress about what methods and styles of advice legislators needed at their disposal, the Technology Assessment Act, which would establish OTA, eventually passed and President

Richard Nixon signed it into law in 1972. After a largely productive – if sometimes controversial and tumultuous – lifespan, OTA eventually became the victim of widespread budget cuts. In 1995, the lights went out on OTA.

Socio-technically minded academics and policy-makers often speak with a fond nostalgia for OTA. There are periodically public calls to refund the organization. Representative Rush Holt, a Democratic member of Congress from New Jersey who also has a PhD in physics, argued in the popular technology magazine *Wired* for "reversing the congressional science lobotomy" – that is, the defunding of OTA – "by restoring a once robust science resource to its rightful place" (Holt 2009).[2]

At the time of this article's publication, however, OTA will have been defunct for nearly as long as it was operational. In these interim years, things have changed: For one, the political climate in the US is stormier than it was during OTA's existence. The aggressive partisan divide in the contemporary Congress means everything has become a battleground for ideological contention, and technoscientific issues have not escaped appropriation by some partisans to accentuate or even define that divide. OTA had frequently come under fire by some Republicans, who accused it of being a tool for the Democratic Party (Keiper 2004). Today, there are no prospects for such an institution to serve both houses and parties in Congress until there are significant shifts in the political dialogue.

The lack of a centralized TA capacity moves the US back in time, pre-OTA, when TA functions existed but were so decentralized and varied that they were hardly recognized as such. There is no primary organization, public or private, to innovate new methods, establish best practices, or provide policy guidance. Instead, there are disparate organizations, the connections among which cannot even be called a network. The remainder of this article will describe three discrete – but at times overlapping, interacting, and complementary – institutional settings where activities one could recognize as TA are occurring: government agencies, non-governmental organizations, and academic research centers. The paper will conclude with a brief discussion of the challenges and roadblocks to institutionalized TA in the US.

2 Government Agencies

Even without OTA, the US government gets TA through other means. We will largely focus on the ways TA emanates from the federal tier before pointing to TA at the state level.

After OTA shut down, Congress shifted responsibility for conducting officially sanctioned TA to the Government Accountability Office (GAO), at first as a pilot program and then, starting in 2008, as a permanent function. GAO was initially established in 1921 as the General Accounting Office until a 2004 legislative act changed its name. Observers often referred to GAO as the "congressional watchdog" for its audits and investigations of how the federal government spends public money. Part of GAO's mission, however, overlaps with that of parliamentary TA, to "provide Congress with timely information that is objective, fact-based, nonpartisan, nonideological, fair, and balanced".[3]

Similarly, the agency's own broad definition of TA matches the spirit of the overarching goals of other TA organizations: "the thorough and balanced analysis of significant primary, indirect, and delayed interactions of a technological innovation with society, the environment, and the economy and the present and foreseen consequences and impacts of those interactions".[4] While this aim is laudable, and individual TA reports issued by GAO have been well-received, the TA function there has not come close to being able to replace OTA's organizational capacity and leadership. GAO's TA function – which has produced only seven reports since 2002 – is somewhat lost within a larger, non-technical organization.

The Federal Trade Commission (FTC) represents another increasingly TA-like function, this time from the executive branch of US government. While it does not have an official mandate for TA – its mission is to "protect consumers" and "promote competition" – FTC has, over the past fifteen years, been on the frontlines of analyzing and policing issues related to information privacy and the data economy. FTC holds workshops and writes in-depth reports on these

issues, which usually receive heavy attention and coverage from journalists, academics, and policy wonks.[5] Legal scholars Solove and Hartzog (2014, p. 583) find that, "in practice, FTC privacy jurisprudence has become the broadest and most influential regulating force on information privacy in the United States – more so than nearly any privacy statute or any common law tort".

In addition to the few federal agencies that conduct both *de jure* and *de facto* TA, presidential committees and commissions often provide advice to the executive branch through the conduct of TA-like activities. For example, in January 2014 the President's Council of Advisors for Science and Technology (PCAST) – a standing body advisory to the President and his Office of Science and Technology Policy – conducted a 90-day review of big data and privacy. PCAST released the resulting report "Big Data: Seizing Opportunities, Preserving Values" to the public, which became, according to the White House, "part of the foundation for future policies and actions that will help us stay at the forefront of this rapidly evolving sector".[6]

There are also presidential commissions that are more ad hoc than PCAST, but more stable than any one of its studies. Perhaps the most high-profile TA-like commission has been the Presidential Commission for the Study of Bioethical Issues.[7] This commission releases, on average, biannual reports that look at questions related to the ethical and social aspects of scientific research and technological development. Neither as technical nor as wonky as traditional TAs, the Bioethics Commission's reports are much more philosophical in their orientation: They sketch out ethical frameworks, principles, and approaches; they grapple with larger political questions related to justice, fairness, and democracy; and they consider individual rights, dignity, and autonomy.

Even in the absence of OTA, the most well-institutionalized governmental TA capacities exist at the federal level. "The technology assessment movement that contributed to the creation of OTA had only a modest impact in the states" (Guston et al. 1997, p. 235), however, and while there is some demand in the state legislatures for their own technical information and analysis, the supply is short. Part of the problem is that tight budgets and limited resources mean that state legislators often relegate TA-like functions to staffers – who are already stretched thin and likely not experts themselves. This situation leaves most states without their own dedicated organizations for TA, and state legislators must instead rely on whatever forms of distributed TA they have access to and trust to give reliable analysis – often including not only explicitly political organizations like executive agencies and lobbyists, but also ostensibly non-political, non-governmental organizations like state-level academies of science and state universities.

3 Non-governmental Organizations

In addition to official government agencies, there are many non-governmental organizations (NGOs) that undertake TA. We will describe and provide some examples of three major categories: think tanks and policy advocacy, quasi-governmental organizations, and media platforms.

There are many think tanks and policy advocacy organizations that conduct familiar TA activities, e.g., writing research reports, providing real-time analysis and commentary via articles, blog posts, and press releases, and generating policy recommendations directed at political decision makers. Unlike some government agencies like the former OTA or the current GAO that strive to be bipartisan and neutral, these organizations have explicit ideological positions with regards to what values, interests, and worldviews their work supports. Possessing such a worldview does not necessarily degrade their TA. One does, however, need to be conscious of the choices and framings that influence their analyses and conclusions. These NGOs are varied, and enumerating an in-depth, ideologically ordered, cross-section of them is beyond our current scope – especially since their TA functions are usually just one part of a larger organization. Some examples include the regulatory focus on "Internet and Technology" within the right-wing Heritage Foundation and the "Open Technology Institute" program within the centrist New America Foundation. Recently, the Brookings Institution, a left-center think tank, released a white paper that made an argument for creating what the author called a "Federal Robot-

ics Agency" (Calo 2014). This proposed agency – which would advise lawmakers, file court briefs, and fund new research – would serve as a source of in-depth knowledge about the social, legal, and policy aspects of the broad technical field of robotics. While motivations driving these legislative prescriptions are praiseworthy, white papers that take a strong stance on supporting efforts for (institutionalized) TA are still rare cases.

Curiously enough, though, a large number of NGOs with explicit focus on technology policy tend to argue for positions on the civil libertarian side of the political spectrum. Influential instances are the American Civil Liberties Union's project on "Speech, Privacy and Technology", the Electronic Frontier Foundation, the Center for Democracy and Technology, and Electronic Privacy Information Center. One could speculate about reasons for this ideological cluster: Perhaps new technologies, especially those related to digital information and communications, pose a greater – or at least more obvious – actual and potential threat to civil liberties than previous technologies did; or perhaps articulate, well-positioned, and wealthy people advocate for these libertarian policies that suit both their ideological disposition and their interests in these technologies.

While think tanks and policy advocacy organizations vie for attention in a decentralized TA environment, one large, centralized player does remain – the quasi-governmental National Academies complex, composed of the National Academy of Sciences, the National Academy of Engineering, the Institute of Medicine, and the National Research Council. The National Academies' TA capacity – the scope of topics, the process for conducting studies, the prolific output (two to three hundred reports annually), and the authoritative position – is, perhaps, the closest institutional proxy to OTA that exists in the US today – indeed, many high-ranking OTA personnel moved to the Academies. The National Academies' wide-ranging TA is unique when compared to other quasi-governmental organizations that only focus on specific technologies, e.g., the "Project on Emerging Nanotechnologies" partnership between the Woodrow Wilson International Center for Scholars and the Pew Charitable Trusts.

An emerging trend of media platforms has begun to serve TA-oriented functions. These platforms strive to present analyses, arguments, and recommendations in a way that a non-specialized audience can understand and incorporate into their lives. Such platforms are still scarce, but there are notable vanguards including the "Future Tense" program – a partnership between the New America Foundation, *Slate* magazine, and Arizona State University – which aims to "explore emerging technologies and their transformative effects on society and public policy."[8] Through a fellowship program, a regular series of public events, and a dedicated channel on *Slate.com*, Future Tense presents a multi-scalar way of spreading its impact. Another example is *The New Atlantis: A Journal of Technology and Society*, an outlet that describes itself as "an effort to clarify the nation's moral and political understanding of all areas of technology."[9] Specifically targeted at policy-makers and scientists, as well as an interested public, *The New Atlantis* is one of a few hybrid outlets that tow the line between professional journal and popular magazine. It does so by combining elements of academic rigor and socio-technical topics with the argumentative style and lucidity of a political commentary magazine. The hope is that such a synthesis hits the right balance where technological topics can be assessed in a way that has broader political and socio-cultural impacts. Platforms like Future Tense and *The New Atlantis* are relatively new, so it remains to be seen how effective they actually turn out to be at providing fresh approaches to both the practice and dissemination of TA.

As media platforms, Future Tense and *The New Atlantis* also represent the work of think tanks and policy advocacy groups expanding their vision and audience beyond traditional, narrowly cast decision makers and toward the educated public. A group called Expert and Citizen Assessment of Science and Technology (ECAST) pursues a similar effort, but oriented toward the creation of participatory TA (pTA). Rather than advocate for a recreated OTA, a group representing academic research (Arizona State University), science museums (Museum of Science, Boston), quasi-governmental organizations (the Woodrow Wilson International Center for Schol-

ars), non-governmental organizations (the Loka Institute), and citizen science (Science Cheerleader and SciStarter) came together in 2010 to create ECAST. While marginally institutionalized, ECAST has nevertheless spearheaded US involvement in the participatory project "World Wide Views on Biodiversity", organized by the Danish Board of Technology, and has received a cooperative agreement from the US National Aeronautics and Space Administration to conduct a pTA of NASA's planned Asteroid Initiative.

4 Academic Research Units

For readers of this journal, perhaps the most familiar modes of TA – and the ones they are likely most directly contributing to – are those stemming from academic research units. These university-based organizations grew up around the TA-like funding schemes from public and private sponsors, which provide the resources needed to coordinate and direct research outcomes. They all operate differently, based, in part, on the parameters, goals, and conditions inherent to external funding sources. But there is a more general family resemblance among these organizations that reflects the culture of their academic context. Unlike the other institutional categories we describe, TA originating from academic research is most heavily geared towards epistemic contributions, dialogue, and critique, with an emphasis on academic publishing, and with some organizations undertaking pTAs and/or writing white papers for industry and policy-makers. While academic research centers are often funded by government agencies (e.g., the U.S. National Science Foundation [NSF] or U.S. Department of Energy), their forms of TA tend to be somewhat more removed from policy-makers than think tanks and quasi-governmental agencies. Many such activities have been spawned by connecting societal research to new or emerging science and technology research, e.g., the Ethical, Legal and Social Implications (ELSI) Research Program attached to the Human Genome Initiative and the social and ethical implications (SEI) research attached to the National Nanotechnology Initiative.

Examples of the latter are the two Centers for Nanotechnology in Society, one at Arizona State University (CNS-ASU) and the other at University of California, Santa Barbara (CNS-UCSB). NSF funds these centers to conduct a variety of academic research, public engagement projects, and informal science education initiatives (such as working with science museums) – many of which revolve around questions of governance. Another example is the Belfer Center for Science and International Affairs (BCSIA) at Harvard University, which focuses on the intersections among science, technology, environment, and security. BCSIA advances scholarly knowledge and takes an active role in providing policy advice to lawmakers, diplomats, and military leaders. A third is the Center for Internet and Society at Stanford University, which researches information and communication technology and law, focusing on regulation and legal protection for civil liberties, privacy, data protection, and network neutrality. While lodged in universities, these centers and their numerous cognates are not very different from their counterpart "think tanks" in NGOs.

5 Conclusion

In the US context, TA comprises a highly distributed set of organizations, which are at best loosely networked together by a broadly shared and overarching function, but distinguished by varying capacities, methods, values, intentions, and goals. On one hand, distributed TA allows for an agile, bottom-up style where not one particular type of TA necessarily becomes dominant and shuts out other alternatives. On the other hand, the basic challenge with distributed TA is that there is little or no coordination of what subjects are studied, how they are analyzed, and how to ensure assessments have impact. There are gaps and clusters in the distributed TA network. That is, we see partial coverage of scholarly issues – with clusters around, for example, civil liberties like privacy and free speech or bioethical concerns related to research conduct and individual harms – and of existing or emerging technologies – with clusters around, for example, nanotech-

nology, information and communication technologies, and environmental topics.

The purpose of this paper is to give an overview of the institutional landscape. Therefore, we are reticent to go further than that descriptive goal by providing our own blueprints or predictions about what the future holds for TA in the US. As we see it, right now the National Academies complex represents the most holistic, diversified organization, but it is still independent and discrete, just a larger node in the network. There is not a single institution that acts like a leader, whether through coordinating dispersed efforts, serving as a clearing house for best practices, or ensuring influence and impacts. Much more planning, communication, and resources are needed before such an institution, or small group of institutions, could be created to oversee, manage, and tighten the network of distributed TA.

It is also possible that things will remain stable, and widespread debates continue to be the norm. Worse, the capacity for TA could degrade further, until it is nothing more than *ad hoc* advocacy and speculation. But one thing is certain: The nature of the present distributed model is rife with too much uncertainty to be sure of what will emerge.

Moreover, it is difficult to point to one primary cause for this form of distributed governance. The reasons likely comprise a diverse set of factors. Anything beyond (educated) speculation, however, would require a study that exceeds the boundaries of this paper. As explained in the introduction, fierce partisanship in the US impedes legislative endeavors such as creating new agencies or granting robust capacities to existing ones. Additionally, "technology" and "innovation" hold positive, even revered, positions within the dominant worldview in the US. That is, for many, innovation is an end in itself – rather than a way to make progress toward improved public health, sustainable energy production, etc. –, so any self-conscious attempt at governing the development or implementation of a technology is seen as unnecessary, or even backward. When combined with the iron grip of the invisible hand of capitalism, the technological optimism of American culture can put quite a stranglehold on (institutionalized) TA in the US.

Disclosure Statement

Jathan Sadowski previously worked for the "Future Tense" partnership between the New America Foundation, *Slate* magazine, and Arizona State University, and he is a graduate student in CNS-ASU. Dave Guston is a principal in ECAST, and the director of CNS-ASU.

Notes

1) Inouye and Süsskind (1977) argue that OTA's lineage reaches back, indirectly, to a 1937 government report, Technological Trends and National Policy.
2) In-depth assessment of the many lessons to be learned from the OTA experience can be found in other volumes (e.g., Morgan/Peha 2003).
3) http://www.gao.gov/about/index.html (download 6.8.14).
4) http://www.gao.gov/technology_assessment/key_reports (download 6.8.14).
5) FTC's most recent report was released in May 2014: "Data Brokers: A Call for Transparency and Accountability"; http://www.ftc.gov/news-events/press-releases/2014/05/ftc-recommends-congress-require-data-broker-industry-be-more (download 13.11.14).
6) http://www.whitehouse.gov/issues/technology/big-data-review (download 7.8.14).
7) http://bioethics.gov/about (download 7.8.14).
8) http://futuretense.newamerica.net/ (download 7.8.14).
9) http://www.thenewatlantis.com/about/ (download 7.8.14).

References

Bimber, B., 1996: The Politics of Expertise in Congress: The Rise and Fall of the Office of Technology Assessment. Albany, NY

Bimber, B.; Guston, D.H., 1995: Politics by the Same Means: Government and Science in the United States. In: Jasanoff, S.; Markle, G.E.; Peterson, J.C. et al. (eds.): Handbook of Science and Technology Studies. Thousand Oaks, CA, pp. 554–571

Calo, R., 2014: The Case for a Federal Robotics Commission. White Paper for the Brookings Institution; http://www.brookings.edu/research/reports2/2014/09/case-for-federal-robotics-commission (download 21.10.14)

Guston, D.H., 2003: Insights from the Office of Technology Assessment and Other Assessment Experienc-

es. In: Morgan, M.G.; Peha, J.M. (eds.): Science and Technology Advice for Congress. Washington, DC, pp. 77–89

Guston, D.H.; Jones, M.; Branscomb, L.M., 1997: Technology Assessment in the U.S. State Legislatures. In: Technological Forecasting and Social Change 54/2–3 (1997), pp. 233–250

Hill, C.T., 1997: The Congressional Office of Technology Assessment: A Retrospective and Prospects for the Post-OTA World. In: Technological Forecasting and Social Change 54/2–3 (1997), pp. 191–198

Holt, R., 2009: Op-Ed: Reversing the Congressional Science Lobotomy. In: Wired, April 29; http://www.wired.com/wiredscience/2009/04/fromthefields-holt/ (download 4.4.13)

Inouye, A.; Süsskind, C., 1977: Technological Trends and National Policy, 1937: The First Modern Technology Assessment. In: Technology and Culture 18/4 (1977), pp. 593–621

Keiper, A., 2004: Science and Congress. In: The New Atlantis 7 (2004), pp. 19–50

Kunkle, G.C., 1995: New Challenge or the Past Revisited? The Office of Technology Assessment in Historical Context. In: Technology in Society 17/2 (1995), pp. 175–196

Morgan, M.G.; Peha, J.M., 2003: Science and Technology Advice for Congress. Washington, DC

Solove, D.J.; Hartzog, W., 2014: The FTC and the New Common Law of Privacy. In: Columbia Law Review 114 (2014), pp. 583–676

Contact

Jathan Sadowski
Consortium for Science, Policy & Outcomes
Arizona State University
Interdisciplinary B Room 366, 1120 S Cady Mall,
Tempe, AZ 85287
Email: Jathan.Sadowski@asu.edu

Prof. David H. Guston
Consortium for Science, Policy & Outcomes
Center for Nanotechnology in Society
Arizona State University
Interdisciplinary B Room 366, 1120 S Cady Mall,
Tempe, AZ 85287
Email: David.Guston@asu.edu

« »

Experiments in Technology Assessment for International Development: What Are the Lessons for Institutionalisation?

by Adrian Ely, University of Sussex, Patrick van Zwanenberg, CENIT, and Andrew Stirling, University of Sussex

Several countries across the OECD have a relatively strong history of using technology assessment (TA) to inform science, technology and innovation (STI) policies. But many lower income, developing countries lack the capabilities and institutions for doing so. Despite its more general potential role in this area, TA has been used relatively little (in or outside the OECD) to inform and challenge investments and policies that address international development objectives. This paper discusses two case studies in which non-governmental TA exercises have focussed on international development objectives in and across lower income countries. Both have made particular efforts to include broader perspectives in the TA process. The paper asks what we can learn from these networked "experiments" and explores possibilities for further institutionalisation of TA for international development.

1 Introduction

International organisations (see e.g. UN System Task Team 2012) often point to key roles for science, technology and innovation (STI) in helping to foster sustainable and inclusive development. This includes moves towards a "green economy in the context of poverty alleviation and sustainable development" discussed at the 2012 Rio+20 conference (UNEP 2011) and to other international development objectives such as the effective implementation of the UN Framework Convention on Climate Change (UNFCCC), maintaining progress towards millennium development goals (UNDP 2011) and the formulation and realisation of sustainable development goals (OWG-SDGs 2014).

Annual global expenditure on research and development continues to grow beyond one tril-

lion dollars. The current systems of governance mean, however, that only a small proportion of this investment is focussed on challenges to international development. Even when investments explicitly focus on development objectives, their wider long-term efficacy is often in question (STEPS Centre 2010). This is because the existing efforts are steered by powerful incumbent interests, which are often misaligned with those of the most vulnerable groups and frequently fail fully to account for social, technical and ecological complexities and uncertainties. Given these conditions, how can the oft-cited potential of STI in attaining these goals be better realised?

Technology assessment (TA) can directly address these challenges. As defined here, TA is a broad set of practices aimed at informing, shaping and prioritising technology policies and innovation strategies by deliberately appraising in advance their wider social, environmental and economic implications. The aim of this paper is to help us understand how TA can address the imperatives discussed above. It provides examples of initiatives that have attempted to do so and explores specific ways in which these kinds of initiatives may be institutionalised. To do this, we first describe the changing approaches to TA in the OECD and in developing countries over the past four decades. Drawing on evidence from two case studies, we analyse how particular aspects (especially the broadening out of inputs to TA and the opening up of the outputs of TA, discussed in more detail by Ely et al. 2014) have allowed some initiatives at the national or international levels to address some shortcomings in existing patterns of innovation. These findings raise significant practical issues for future TA initiatives, especially as these relate to the harnessing of science and technology for international development.

2 Debates Around Technology Assessment Across the OECD: Towards Broadening Out and Opening Up

TA emerged in the 1960s and was first institutionalised in the United States Office of Technology Assessment (OTA) in 1972, and subsequently in several other OECD countries (van Zwanenberg et al. 2009). These institutions arose partly in response to political controversies around technologies such as civilian nuclear energy. They were seen by proponents as providing unbiased analysis of the impact of a technology, usually to Congress or parliament. Typically offered directly to political decision-makers, the aim was to guide public decisions about which technologies should receive state support. Brooks argued that "ideally the concept of Technology Assessment is that it should forecast, at least on a probabilistic basis, the full spectrum of possible consequences of technological advance, leaving to the political process the actual choice among the alternative policies in the light of the best available knowledge of their likely consequences" (Brooks 1976). However, arguments have been made since the outset that this kind of forecasting is neither practically achievable nor neutral and objective.

In practical terms, it has long been recognised that the open, path-dependent dynamics of innovation (Nelson/Winter 1982; Rosenberg 1982) implicate deeper and more intractable forms of uncertainty than it is possible to address in the probabilistic approaches of risk assessment advocated in Brooks' argument. An extensive literature has illuminated contrasting states of "uncertainty" – where probabilities are not known (Knight 1921); "ambiguity" – where there is disagreement over defining, ordering or interpreting the possibilities themselves (Dreyer/Renn 2009); and "ignorance" – where we don't know what we don't know (Wynne 1992). Each poses more profound challenges for TA than are encompassed in the mere state of risk – which assumes both outcomes and probabilities can be definitively measured (Morgan/Henrion 1990). Yet these crucial lessons are often obscured by the expediently reductive language of probabilistic approaches, as if all forms of incomplete knowledge remain equally tractable to risk assessment. Promoting participation in TA has been proposed as an appropriate response to the uncertainties that characterise technological modernity (Hennen 1999). More recent work has suggested that more explicitly appreciating the distinctions between these contrasting aspects of incomplete knowledge or "incertitude" (Stirling 1998; Stirling/Gee 2002) reveals possible roles for greater diversities of approaches in TA. Some of these have been the object of experiments within

Europe's diverse TA landscape (see for example results from the PACITA project[1] and Ganzevles/van Est 2012, also in this volume).

Other critics have drawn into question the objectivity of technical TA, pointing out that assessments were necessarily dependent on non-technical and often implicit framing assumptions, especially about the nature of the problems prompting assessment, the questions to be asked, the scope of appraisal, the options under consideration, and the appropriate methods to employ in considering them (Wynne 1975).

One response to both the practical challenges of dealing with incertitude and the need to make explicit and interrogate the framing assumptions involved in TA has been to broaden out the inputs to technology assessment (Stirling 2008; Ely et al. 2014). Briefly, broadening out inputs involves extending the scope of a TA exercise in a number of dimensions. An appraisal could, for example, include a greater variety of problem definitions and technological and non-technological options, implementing policies, benefits and impacts, other relevant issues, uncertainties and ambiguities, possibilities and scenarios, values and understandings, and methods of analysis and deliberation. The more even the attention to reasonable alternatives in each of these dimensions, the more broadened out is the particular exercise (Stirling 2008).

These issues of breadth concern the inputs to technology assessment, i.e. the uncertainties, issues, perspectives and options that are included in the appraisal. Another dimension concerns the outputs of TA to policy processes and wider political debates. In comparison to broadening out inputs to TA, opening up its outputs involves not so much the deliberations and analysis that are internal to a given exercise, but the manner in which the eventual findings are communicated and enacted – not only to clients, but also to associated policy-making debates and wider political discourse. Rather than providing a single, ostensibly definitive (objective and comprehensive) characterisation of a technology or related problem (as in old models of TA), an opening up approach delivers a more plural and conditional set of outputs. Each explicitly reflects not only an alternative reasonable recommendation, but also the associated assumptions, circumstances or perspectives (Stirling 2008). In short, this involves the outputs of TA being expressed not as single, ostensibly definitive, results, but as plural and conditional reflections of whatever constitutes the most salient axes of sensitivity that emerge in the analysis. This means highlighting symmetrically a number of in-principle contrasting but equally valid interpretations for appropriate ways forward, each with its associated assumptions, rationales or contexts (Stirling 2010).

Opening up TA can help decision-makers and funders by attending to policy options, issues, uncertainties and perspectives that would otherwise be marginalised. Although not uniquely determining a specific decision, plural and conditional findings can inform political commitments about which kinds of projects to prioritise. And, although not preventing clear political decisions, opening up TA can usefully highlight the benefits of diversity (Stirling 1998; Stirling 2007; Sclove 2010).

These ongoing debates have emerged in very particular governance contexts (characterised by relatively established parliamentary democracy and scientific institutions and by comparatively high average incomes and access to education that seem to assist a positive role for TA). This is not the case in many parts of the world in which public controversies around different technological options form less of a focus of public debate and trans-disciplinary research is less developed. The next section discusses debates beyond the OECD countries, in which most of the TA scholarship and practice has so far been conducted.

3 Technology Assessment in the Context of a Developing Country

Technology assessment has been much less common outside the OECD countries. This is despite longstanding recognition of the dangers of introducing technologies to developing countries without appropriate prior user engagement, assessment or foresight – leading to low uptake, wasted investments and counterproductive consequences (Châtel 1979; Chambers et al. 1989; Goonatilake 1994; Scoones/Thompson 2009). Where it has been conducted in developing countries, TA has tended to have been largely

technical in nature, carried out within centralised institutions or by external consultants to direct government or donor projects. Explicit attention to the diverse priorities and understandings of different stakeholders and citizens has been rare.

This is despite the fact that current appreciations of physical, social and political dynamics in international development (Scoones et al. 2007) call for a more systemic view that attends to multiple and interacting forms of innovation. In the context of a developing country, greater recognition of the implications of complexity, uncertainty and divergent values is necessary in order for TA to explore the plurality of alternative possible "pathways to sustainability" and their associated social and environmental implications (Leach et al. 2010). As discussed above, broadening out the inputs and opening up the outputs of TA can address challenges presented by competing perspectives on innovation-related problems and potential solutions.

The kind of narrowness of TA described above can be especially problematic in lower income countries. Here – despite strenuous and inspiring efforts – the limited capacities of governance mean that the asymmetries of power, privilege and vulnerability often remain more acute. In particular, destitution leads to the exclusion of particular communities. Chronic barriers to educational access and political representation aggravate this marginalisation. These predicaments strongly amplify the rationales for broadening out TA in the ways discussed above. Although not offering panaceas, many methods for broadening out, mentioned above, can help reinforce wider institutional reforms to help extend the range of alternative options and perspectives engaged as inputs to TA and hence help mitigate the ubiquitously distorting effects of privilege and power.

Similarly, the typically greater diversity in developing countries makes it all the more important to open up TA outputs, delivering plural and conditional advice to disparate governmental and non-governmental actors typically involved in development processes. In particular, being explicit about the context specificities, framing assumptions and perspectives upon which the outputs of TA depend can help TA facilitate wider questioning of particular innovations, their transferability to other contexts and the ways in which these are conditioned by power gradients. A further important implication of opening up TA outputs is that careful design can reduce the costs and burdens of more centralised, technical approaches. This is especially important in the setting of an underfunded developing country. The reason is that opening up can relax the pressure to claim that a single TA appraisal is unassailably objective and comprehensive – and to avoid the associated demands for costly (but ultimately futile) pretensions of a definitive analysis.

Limited numbers of participatory TA activities associated with emerging technology and other potential solutions to development challenges have taken place in low income countries. Interest has increased since the 1990s in participatory, "deliberative and inclusionary processes" (DIPs) in areas like the potential role of genetically modified crops in food or fibre production (Wakeford 2001; Wakeford 2004), as carried out in India (ActionAid 2000), Mali (IIED 2007), Zimbabwe (Rusike 2003), and Brazil (Toni/von Braun 2001). Linking across countries in a co-ordinated approach has been relatively rare. We now go on to discuss two case studies that to varying extents displayed tendencies to broaden out and open up TA and were co-ordinated to varying extents across national borders, before reflecting on their implications for institutionalising TA for international development.

4 The International Assessment of Agricultural Knowledge, Science and Technology for Development

The International Assessment of Agricultural Knowledge, Science and Technology for Development, (IAASTD) was a joint initiative of the World Bank, UNDP, FAO, and other institutions. Running between 2003 and 2008, its aim was "to assess the impacts of past, present and future agricultural knowledge, science and technology on the reduction of hunger and poverty, improvement of rural livelihoods and human health, and equitable, socially, environmentally and economically sustainable development" (IAASTD 2009, p. vi). A networked, international multi-stakeholder steering committee established the scope – and

the processes and procedures by which it would be conducted and governed – following consultation with over 800 participants from diverse sectors and locations (Scoones 2009). The assessment was overseen by a multi-stakeholder bureau, which also selected 400 scientists (from a range of disciplines and institutional settings) to author the report. The resulting five regional reports and one global report took four years to produce.

The inclusion of such geographically and sectorally diverse groups (including business, civil society and policy-makers, if not wider citizen participation) had several important consequences. First, it meant that many often-excluded perspectives were voiced – on occasion finding their way into the overall report. As one participant noted: "perhaps for the first time, those advocating sustainable agriculture and indigenous knowledge had been given a place at the table, and got (some of) their views acknowledged" (Scoones 2009). Second, it allowed a range of viewpoints, perspectives, arguments, assumptions and types of evidence to be brought together in one place. One of the key findings of the IAASTD is that there are diverse and conflicting interpretations of the past and current role of agricultural science and technology in development, which need to be acknowledged and respected (IAASTD 2009).

Broadening the scope of IAASTD beyond agricultural science and technology (to include other types of relevant knowledge held by agricultural producers, consumers and end users and to also assess the role of institutions, organizations, governance, markets and trade) led to the options under consideration becoming correspondingly more ambitious and wide-ranging. Attention stretched to include issues such as: the system of agricultural subsidies in the OECD countries; trade rules and intellectual property law; and traditional and local knowledge in community-based innovation. For some, this was too broad: "…if you propose everything, then you don't prioritise anything" observed one commentator (Coghlan 2008).

While the IAASTD process tried to encourage a (broad) plural and inclusive process that genuinely engaged with political and evaluative – as well as technical – issues, it implicitly held an expectation that uncertainties could be resolved (or at least narrowed) by a rational, objective, scientific debate among expert peers, leading to common understandings and consensus visions for the future (Scoones 2009). To some extent, the tension between these contending characteristics was managed through informal debate and argument rather than allowing different political and value positions to be explicitly acknowledged. On particularly contentious issues, such as the potential utility of genetically-modified (GM) crops, consensus was unobtainable and recalcitrant differences of opinion led to the withdrawal of many private sector participants (Nature 2008). Such antagonistic dynamics are not necessarily without value, however the IAASTD did not use the opportunity to explore the worldviews and perspectives that underlay this polarisation or attempt to offer plural and conditional outputs that reflected them.

At the same time, the IAASTD did seek to delineate where there was consensus and where there was uncertainty, and to discuss minority points of view. Furthermore, it did not make unitary recommendations, only a series of options for action at the global level and each of the regional levels, on the basis that different stakeholders who might wish to act on those options have different sets of priorities and responsibilities, and operate in different circumstances. It is difficult to ascertain any concrete impact on funding of agricultural innovation, however the recognition of the multi-functionality of agriculture has been maintained in subsequent internationally-cited reports on similar topics (e.g. Foresight 2011) and thus to a limited extent opened up the debate in this area. An IAASTD spokeswoman argued that "even changing perceptions of farming is quite a shift from the past 50 years, and they should drive the agenda for the next 50" (Coghlan 2008).

5 Exploring the Role of New Technologies in Clean Water Provision Through Stakeholder Events in Zimbabwe, Peru and Nepal

In a rare example of nanotechnology-focussed TA-type activities in developing countries, the international NGO Practical Action joined with other stakeholders to undertake the "Nanodialogue" initiative on clean water provision in

Zimbabwe and a range of related activities in Peru and Nepal. The Zimbabwe event unfolded over three days in 2006, when UK researchers from the think-tank DEMOS and the University of Lancaster gathered in Harare with Practical Action and local stakeholders, scientists and citizens from two communities in Zimbabwe, to investigate the general challenge posed by providing clean water (Grimshaw et al. 2007; Stilgoe 2007; Mellado 2010). The stakeholder workshop approach illustrated by the Zimbabwe nanodialogue was also used in similar exercises co-ordinated by Practical Action to investigate potable water provision in Nepal (Grimshaw 2009) and issues around water and health in Peru (Mellado 2010). The focus of the current analysis, however, is on the Zimbabwe exercise.

As part of a larger, UK government-supported programme of nanodialogues, the process was organised around the question "can nanotechnologies help achieve the millennium development target of halving the number of people without access to clean water by 2015?" However, it focussed on identifying and understanding various sources of problems in water provision, as well as discussing a number of potential technological and non-technological solutions, with nanotechnologies included as just one option among many. By including academics from the Zimbabwean Academy of Sciences and UK and South African universities, representatives from several Zimbabwean Ministries and many other public agencies, and by directly involving communities in a participatory process, the Zimbabwe nanodialogue broadened out both technical and non-technical inputs to the process. Addressing not only technological, but also cultural and political issues in discussion, it also delivered a number of general recommendations to government and non-government actors, both national and international.

The process also included members of two different citizen communities, crucially differentiating perspectives, rather than seeing "users" as a uniform group. This enabled attention to be paid to a diversity of contexts in which nanotechnologies might be employed – with issues such as control and ownership put forward as key issues for consideration in ways that might otherwise have been neglected. Organisers concluded that the inclusion of policy-makers and other innovation system actors at the workshop led to a greatly improved understanding and capacity than would have been the case for a less participatory TA exercise.

Despite being named a nanodialogue, the scope of the Zimbabwe TA-like exercise focused on diverse policy responses to water challenges, looking well beyond nanotechnology. Indeed, the shared finding emerged after the first two days that "there is no real water quality issue that cannot be solved with existing technologies" is itself an illustration of a kind of opening up that would be impossible under a more singular focus on a particular technology. However, the final outputs of the nanodialogue were not limited to this consensus. Discussions raised a large number of further questions, including those targeted at scientists about the possibility of using nanotechnologies in combination with other options, as well as the timeframes and specific conditions under which these might be favourable. The inclusion in the report of unresolved questions, ambiguities and uncertainties, alongside more specific findings and recommendations, also provided a more open basis for future societal discussion. This may not have helped bring about direct policy change (and to some extent subsequent investment was in any case precluded by the context). But the process highlighted the complexities of, and alternatives to, the focal set of new technologies.

6 Lessons for New Institutional Models of TA for International Development

Based on this evidence, what implications arise for new TA institutions, especially those focussing on international development challenges with a global dimension? In particular, what can these examples suggest for institutionalised approaches in developing countries? Here, a number of lessons emerge for the design and implementation of TA institutions for international development. Taken together with other studies in this area (e.g. PACITA), these suggest the following:

- TA exercises are best viewed in context – as crucial elements in wider processes of social appraisal. The key role of TA, therefore, is not to undertake the entire task of justifying tech-

nological decisions, but to catalyse, inform, enable and strengthen these broader social and political processes.

- There are synergies – not just tensions – between participatory and expert-led approaches to TA. Broad, participatory approaches directly address challenges of framing the problems and options to be addressed – with outputs offering usefully to inform more traditional expert-based analysis.
- The networked, multi-actor example offered by exercises like the IAASTD can offer a more flexible and agile approach that allows conversations across disciplinary, technological and sectoral domains (vital to respond to the complex challenges of sustainable development).
- Drawing on external sources of knowledge and experience beyond a central TA office may be particularly advantageous in developing country settings, where in-house expertise and capacity may be especially lacking. Within a networked approach, the core role (for example of a government agency) centres on co-ordinating, rather than conducting, TA.
- Capacities in methods and practices for these kinds of TA are often lacking in many developing countries. Data and statistics that can inform TA activities are also often scarce. Here, appropriate pooling of resources between countries may enable more effective TA. At the same time, capacity within co-ordinating institutions is a prerequisite to developing networked approaches.
- Resources and capacity may often also be lacking for effective political decision making in response to TA. Acknowledgement of these realities forms an integral part of the quality of openness, not least to avoid disillusionment and disrespect of participants. Nevertheless, the broadening out and opening up of TA described here may generate tacit learning within wider innovation systems, even if particular outputs do not become explicit bases for concrete decisions.
- There is a need to move beyond a series of unconnected, isolated TA experiments, towards more coherently-co-ordinated (but still diverse) internationally-networked approaches, allowing participatory TA to be scaled up in wider areas of the world. The focus should therefore not just be on specific TA exercises in particular settings, but also on broader trans-national programmes, in order to enable cumulative distributed learning about contending innovation imperatives and possibilities and the associated appropriate TA processes.

It is easy to speculate on the potential institutional sites in which internationally networked technology assessment could be based. However, the evidence base for any such proposals is absent. There are very few cases where citizen perspectives have been sought to inform policy making in a co-ordinated way beyond OECD countries (see for example Worldwide Views on Global Warming[2] which involved exercises in 38 nations and was co-ordinated by the Danish Board of Technology, although not in TA *per se*). International associations focussing on technology assessment (with geographic spread beyond that of the European Parliamentary Technology Assessment[3] or earlier attempts such as the International Association of Technology Assessment and Forecasting Institutions), NGOs (e.g. the International Center for Technology Assessment; http://www.icta.org) and intergovernmental organisations (UN Commission for Science, Technology and Development) could all have roles to play. Key to the efficacy of such institutional arrangements, however, will be their governance structures and articulation with the wider innovation systems in which they would need to be embedded.

Indeed, the most crucial systemic requirements for effective broadening out and opening up of TA are the same qualities towards which this arguably contributes: more responsive relations in the governance of innovation between business, academia, government and civil society. By this means, the broader and more open forms of TA advocated here offer ways to help enhance both technical robustness and societal relevance in global innovation systems. Only by enabling these more networked and internationally co-ordinated kinds of TA might the formidable energies of worldwide innovation systems become more socially equitable, environmentally sustainable and democratically legitimate.

Notes

1) http://www.pacitaproject.eu/
2) http://www.wwviews.org
3) http://www.eptanetwork.org

Acknowledgements

The authors are grateful to the Rockefeller Foundation for providing financial support for the project New Models of Technology Assessment for Development that contributed to the production of this article, which draws on the original STEPS Centre report (Ely et al. 2011) and an associated article in Research Policy (Ely et al. 2014). We also thank the reviewers for useful comments.

References

ActionAid, 2000: ActionAid Citizens' Jury Initiative: Indian Farmers Judge GM Crops. London

Brooks, H., 1976: Technology Assessment in Retrospect. In: Newsletter on Science, Technology and Human Values 17 (1976), pp. 17–29

Chambers, R.; Pacey, R.; Thrupp, L.A., 1989: Farmer First: Farmer Innovation and Agricultural Research. ITDG Publishing, Rugby

Châtel, B.H., 1979: Technology Assessment and Developing Countries. In: Technological Forecasting and Social Change 13 (1979), pp. 203–211

Coghlan, A., 2008: How to Kickstart an Agricultural Revolution. In: New Scientist 198 (2009), pp. 8–9

Dreyer, M.; Renn, O., 2009: Food Safety Governance: Integrating Science, Precaution and Public Involvement. Berlin

Ely, A.; van Zwanenberg, P.; Stirling, A.C., 2011: New Models of Technology Assessment for Development. STEPS Working Paper 45. Brighton, STEPS Centre

Ely, A.; van Zwanenberg, P.; Stirling, A.C., 2014: Broadening Out and Opening up Technology Assessment: Approaches to Enhance International Development, Co-ordination and Democratisation. In: Research Policy 43 (2014), pp. 505–518

Foresight, 2011: The Future of Food and Farming, Final Project Report. The Government Office for Science, London

Ganzevles, J.; van Est, R. (eds.), 2012: TA Practices in Europe. Final Report, PACITA Project

Goonatilake, S., 1994: Technology Assessment: Some Questions from a Developing Country Perspective. In: Technological Forecasting and Social Change 45 (1994), pp. 63–77

Grimshaw, D., 2009: Arsenic Sensor Technology Workshop, Kathmandu, Tuesday 26th May. Practical Action, Rugby

Grimshaw, D.; Stilgoe, J.; Gudza, L., 2007: The Role of New Technologies in Potable Water Provision: A Stakeholder Workshop Approach. Practical Action, Rugby

Hennen, L., 1999: Participatory Technology Assessment: A Response to Technical Modernity? In: Science and Public Policy 26/5 (1999), pp. 303–312

IAASTD – International Assessment of Agricultural Knowledge, Science and Technology for Development, 2009: Agriculture at a Crossroads. International Assessment on Agricultural Knowledge, Science and Technology for Development: Synthesis Report. Washington, DC

IIED – International Institute for Environment and Development, 2007: A Citizens Space for Democratic Deliberation on GMOs and the Future of Farming in Mali. London

Knight, F., 1921: Risk, Uncertainty and Profit. Boston

Leach, M.; Scoones, I.; Stirling, A., 2010: Dynamic Sustainabilities: Technology, Environment and Social Justice. London

Mellado, R. (ed.), 2010: Nanotecnología de agua y saneamiento, Perú: Memorias delseminario y taller. Practical Action and Consejo Nacional de Ciencia, Tecnologíae Innovación Tecnológica, Lima

Morgan, M.G.; Henrion, M., 1990: Uncertainty: A Guide to Dealing with Uncertainty in Quantitative Risk and Policy Analysis. Cambridge

Nature, 2008: Editorial: Deserting the Hungry? In: Nature 451 (2008), pp. 223–224

Nelson, R.; Winter, S.G., 1982: An Evolutionary Theory of Economic Change. Cambridge, MA

OWG-SDGs – Open Working Group Sustainable Development Goals, 2014: Introduction and Proposed Goals and Targets on Sustainable Development for the Post-2015 Development Agenda. Zero Draft presented at OWG13, 14-18 July 2014. United Nations, New York

Rosenberg, N., 1982: Inside the Black Box: Technology and Economics. Cambridge

Rusike, E., 2003: Izwi neTarisiro – Zimbabwe's Citizens Jury. In: Seedling October (2003), pp. 22–29

Sclove, R.E., 2010: Reinventing Technology Assessment: A 21st Century Model – Using Citizen Participation, Collaboration and Expert Analysis to Inform and Improve Decision Making on Issues Involving Science and Technology. Woodrow Wilson International Centre for Scholars, Washington, DC

Scoones, I., 2009: The Politics of Global Assessments: The Case of the International Assessment of Agricultural Knowledge, Science and Technology for Development (IAASTD). In: Journal of Peasant Studies 36/3 (2009), pp. 547–571

Scoones, I.; Leach, M.; Smith, A. et al., 2007: Dynamic Systems and the Challenge of Sustainability. STEPS Working Paper 1. STEPS Centre, Brighton

Scoones, I.; Thompson, J. (eds.), 2009: Farmer First Revisited: Innovation for Agricultural Research and Development. Practical Action, Rugby

Stilgoe, J., 2007: Nanodialogues: Experiments in Public Engagement with Science. London

Stirling, A., 1998: Risk at a Turning Point? In: Journal of Risk Research 1/2 (1998), pp. 97–109

Stirling, A., 2007: A General Framework for Analyzing Diversity in Science, Technology and Society. In: Journal of the Royal Society Interface 4 (2007), pp. 707–719

Stirling, A., 2008: "Opening Up" and "Closing Down": Power, Participation and Pluralism in the Social Appraisal of Technology. In: Science, Technology and Human Values 33/2 (2008), pp. 262–294

Stirling, A., 2010: Keep it Complex. In: Nature 468 (2010), pp. 1029–1031

Stirling, A.; Gee, D., 2002: Science, Precaution and Practice. In: Public Health Reports 117 (2002), pp. 521–533

STEPS Centre, 2010: Innovation, Sustainability, Development: A New Manifesto, Brighton; http://steps-centre.org/wp-content/uploads/steps-manifesto_small-file.pdf (download 21.1.15)

Toni, A.; von Braun, J., 2001: Poor Citizens Decide on the Introduction of GMOs in Brazil. In: Biotechnology and Development Monitor 47 (2001), pp. 7–9

UN System Task Team, 2012: Science, Technology and Innovation for Sustainable Development in the Global Partnership for Development Beyond 2015. UN System Task Team on the Post-2015 UN Development Agenda. United Nations, New York

UNDP – United Nations Development Programme, 2011: Human Development Report 2011 – Sustainability and Equity: A Better Future for All. New York

UNEP – United Nations Environment Programme, 2011: Towards a Green Economy: Pathways to Sustainable Development and Poverty Eradication; http://www.unep.org/greeneconomy (download 14.1.15)

van Zwanenberg, P.; Ely, A.; Stirling, A., 2009: Emerging Technologies and Opportunities for International Science and Technology Foresight. STEPS Working Paper 30. STEPS Centre, Brighton

Wakeford, T., 2001: A Selection of Methods Used in Deliberative and Inclusionary Processes. In: PLA Notes 40 (2001), pp. 29–31

Wakeford, T., 2004: Democratising Technology: Reclaiming Science for Sustainable Development. Intermediate Technology Development Group, Rugby

Wynne, B., 1975: The Rhetoric of Consensus Politics: A Critical Review of Technology Assessment. In: Research Policy 4 (1975), pp. 108–158

Wynne, B., 1992: Uncertainty and Environmental Learning: Reconceiving Science and Policy in the Preventive Paradigm. In: Global Environmental Change 2/2 (1992), pp. 111–127

Contact

Dr. Adrian Ely
SPRU – Science Policy Research Unit
Jubilee Building
University of Sussex
Falmer, Brighton, BN1 9SL, Great Britain
Phone: +44 (0) 1273 873026
Email: a.v.ely@sussex.ac.uk

« »

Cross-European Technology Assessment: Visions for the European TA Landscape

by Walter Peissl, ITA Vienna, and Marianne Barland, Norwegian Board of Technology

The whole of Europe is getting more closely connected and, with the rapid technological development, there seems to be a need for establishing networks and knowledge bases in a cross-European manner. This can be advantageous for both the national and regional levels of policy making as well as for the European one. This paper discusses the past, present and future of cross-European work going on in the field of parliamentary technology assessment (PTA).[1] The main questions to be dealt with will be: What did we learn from past cross-European projects? What is the additional value provided by cross-European TA? And how can cross-European TA be structurally established in the long term? To answer them, we analyse the existing framework conditions for cross-European projects, compare ten cases of previous cross-European projects and draw some lessons. In the final part we present conclusions and recommendations for fostering cross-European cooperation within the TA community.

1 Technology Assessment in Europe

In the 1970s, the OECD, the European Commission (EC) and individual states took initiatives to introduce technology assessment in Europe. Following this, offices for parliamentary technology assessment (PTA) were established in several European countries and regions. In 1990 – following an initiative of Lord Kennet, at that time chair of the advisory board of the U.K. parliamentary TA institution (POST), the European Parliamentary Technology Assessment (EPTA) network was established. Founding member institutions were POST, the Parliamentary Office of the Evaluation of Scientific and Technological Choices – FR (OPECST), the Office of Technology Assessment at the German Bundestag (TAB), the Rathenau Institute, the Danish Board of Technology (DBT), and the Science and Technology Options Assessment at the European parliament (STOA) (Wennrich 1999). Today, EPTA has 14 members and three associate members (http://www.eptanetwork.org). It aims at strengthening the links between parliamentary offices for TA throughout Europe, and establishing TA as an integral method advising parliaments in decision-making. The approaches to TA applied by the member institutions vary widely, both in their organizational structure and working methods.[2]

Although a number of joint projects have been conducted in the framework of EPTA or funded by the European Commission (see below), one cannot speak of regular cross-European cooperation in TA up to now. The whole of Europe is getting more closely connected, the EU is growing, and the rapid technological developments have implications that go beyond national borders. In this respect, there seems to be a need for establishing result-oriented European cooperation and networks in the field of TA, so that technological innovation can be considered in a global perspective, taking into account both national and European realities.

Based on our personal experience and the analysis of several cross-European projects, this paper discusses three topics: What is the added value of cross-European TA work? Who are the addressees and target groups of cross-European projects? And what are the possible tensions between national/regional TA structures and the ambition to "act European"? Within the framework of the PACITA (Parliaments and Civil Society in Technology Assessment) project two workshops have been organized where these questions have been discussed between PACITA partners and other TA actors in Europe[3]. In addition, partners in the PACITA project have compiled several case descriptions of cross-European projects conducted previously, which have been compared with regards to process, financing, mode of cooperation etc., in order to find the strengths and weaknesses of cross-European projects (Barland et al. 2012). The endeavour to achieve closer cooperation between European TA institutions lies at the core of the PACITA initiative. The project has set an aim to foster the

European scope of technology assessment and create a vision for cross-European TA in 2020.

2 Cross-European TA: A Definition and a Short History

In the context of this paper we define cross-European TA as TA (projects) done by a group of TA institutions across borders. It implies a common objective and cooperation but not necessarily the use of the same methods. Cross-European TA is not necessarily pan-European TA in the sense that the whole of Europe (28+) is covered in terms of membership, whether in the consortium or with regard to the results and impact of the project. Pan-European TA on the one hand aims at a collective Europe, whereas cross-European TA cherishes the diversity of approaches and cultural contexts in order to reach added value for all addressees and involved actors.

The history of cross-European TA projects more or less starts (at least within the EPTA context) with the EUROpTA project (1998–1999), which was partly financed by the Targeted socio-economic research TSER programme of the EC in FP4. This first "joint project" already showed some characteristics of cross-European projects: It was the wish of some members of EPTA to work together on methodological issues of participatory technology assessment (pTA). EUROpTA evaluated pTA and its contribution to European policy. It scrutinised the theoretical and conceptual frameworks that underlie both theoretical discussions and practical initiatives of pTA. It clearly showed the differences in Europe and the potential and limitations of pTA at that time in different socio-political contexts. It created added value for the understanding of the different ways pTA could be utilised in different countries and issued guidelines for practice in pTA based on this analysis. From a procedural point of view, cross-European cooperation in this project clearly revealed that in interdisciplinary and intercultural research settings it takes time to find a common understanding and common ground for further work, which then can be highly productive and creative. As time is costly, this leads directly to the next lesson learned: (enough) resources and flexibility are needed. Already this first "joint project" showed in a paradigmatic way some of the key issues we found in our analysis of later projects. The next attempt was the TAMI project (2002–2003), which again was a methodological project that tried to identify "best practices" for different problem contexts in order to develop guidance for the selection of TA methods. TAMI again was to a great part driven by EPTA members and was financed by the EC under the STRATA programme in FP5.

These two projects may be seen as early forerunners. The list below shows the ten further projects with TA units as partners that were analysed during the PACITA project (which in itself is a cross-European project).

- ICT and Privacy in Europe (EPTA, 2004–2006)
- Meeting of Minds – European Citizens' Deliberation on Brain Science (FP6, 2004–2006)
- Energy transition in Europe (EPTA, 2006–2007)
- PRISE – Privacy enhancing shaping of security research and technology – a participatory approach to develop acceptable and accepted principles for European security industries and policies (EC/PASR, 2006–2008)
- Genetically modified plants and foods: Challenges and future issues in Europe (EPTA, 2006–2009)
- Study on Human Enhancement (STOA/EP, Start: 2008–2009)
- World Wide Views on Global Warming (mixed sources, 2008–2009)
- Citizen visions on science, technology & innovation (CIVISTI)(FP7/SSH, 2008–2011)
- Technology Options in Urban Transport: Changing paradigms and promising innovation pathways (STOA/EP, 2010–2011)
- Nano Safety – Risk Governance of Manufactured Nanoparticles (STOA/EP, 2010–2011)

This list[4] shows a broad range of different settings and characteristics of cross-European TA projects. Six out of the ten projects have been

carried out by consortia with TA units only, and one project had a scope beyond Europe.

With regard to funding/initiators, the first group are so-called "EPTA projects". These projects are based on the "Joint EPTA Project Framework", where three or more members can initiate a project, which is open for participation by other EPTA members. They may be classical research projects like "ICT and Privacy in Europe" or rather short but comprehensive overview projects like "Energy transition in Europe". They are based on the EPTA members' own budget. At least for the first research-like projects, this turned out to be one of the weak points. Missing resources and no "external" client – not to be mixed up with addressee – tend to diminish the priority of such projects in the member organisations. This implies the danger of lower commitment by partners and therefore greater efforts at coordination. The later projects, focusing on collecting national policy overviews on a given topic, seemed therefore to be a more suitable format for EPTA projects. These overview projects use a common framework to be filled in by EPTA partners, which can be done in relatively short time. These projects do have a concrete aim and addressee. They are used to complement discussions of parliamentarians and TA practitioners at the EPTA conferences, which are held annually in the capital city of the respective EPTA presidency's country. EPTA reports on five such joint projects from 2004 until 2014 are now available (http://www.eptanetwork.org). Further issues are synthetic biology and technology-related productivity in Europe and the USA.

The second group of projects are based on funding by the European Parliament (EP), represented by STOA (European Parliament – Science and Technology Options Assessment), which itself is part of the EPTA network. From this list of cases STOA commissioned three cross-European TA projects. Since October 2005, the European Technology Assessment Group (ETAG)[5] has served as one of the contractors to STOA. Projects of this kind are clearly defined policy advice studies with a specific addressee (the EP) and are conducted within a rather tight framework.

The EC research framework programmes finance the third – important – type of cross-European TA projects. These projects react to calls of the EC, whereas the EPTA projects only rely on the assessment of the EPTA members as to whether an issue is relevant or not. So far the former have been conducted by small consortia involving a majority of TA institutions (like PRISE) or brought together a lot of different actors (like "Meeting of Minds"). Being bound to calls from the framework programmes restricts the flexibility with regard to themes to a certain extent. Nevertheless some TA institutions have cooperated in such FP projects in recent years; examples beyond those four listed above are: DESSI[5] (2011–2013), SurPRISE[6] (2012–2015) and PACITA[7] (2011–2015).

The ten cases also show the broad range of methods employed in cross-European projects. All include desk research to a different extent, and six out of eleven used participatory elements in their work. The duration was 8 to 40 months and almost all projects at least tried to address policy makers on the European level in addition to those on the national and sometimes regional level. Most of them concluded with reports and more or less concrete recommendations – sometimes more openly referred to as "challenges" or "policy options".

One of the problems that has been articulated is a loss of accuracy due to translation problems occurring in multi-national settings, which intensified as soon as laypeople participate. Multiple translations back and forth between national languages and the working language (English) of the consortia are very critical aspects and have to be given high attention.

Besides the categorisation based on financing we can observe a twofold development in the European scene. On the one hand, many of the cross-European projects rely on and cherish the diversity of approaches used in different countries and TA institutions. On the other hand, there are attempts to apply the same methodology in all the participating countries. The reasoning behind this is (i) to compare results from different cultural settings and (ii) to be cost efficient by designing the projects only once. This second approach was applied by the PACITA

project, which conducted three case studies in some of the participating countries by applying the same method in all of them.

From the small list of projects above and the formal categorisation alone, we can see a high diversity of procedures. Based on this we will now investigate further what this means for the future of cross-European TA.

3 Is There Added Value in Doing Cross-European Projects?

Although the emerging technologies debated in different countries are more or less the same, the contexts and timing of discussions as well as the shaping of technologies will differ nationally. Thus, cross-European TA can contribute to setting the agenda and providing policy support at the European level and at the same time informing the national science and technology discourses. All European countries (whether EU members or not) relate to European regulation in some areas. These areas of regulation are interesting subjects for cross-European TA, which could create a common platform between partners for assessing the national impact and implications as well as challenges to the national implementation of regulations.

PTA institutions have their mandate mainly focused on the national and regional sphere. Some have the explicit task to "watch trends in science and technology" (Ganzevles/van Est 2012) (both national and international), but for none is participation in international projects defined as a formal task. Identifying and understanding the added value in cross-European projects may help to open up and stimulate more cooperation while at the same time justifying international cooperation at the national level.

For TA institutions involved in cross-European co-operation, such participation itself can produce added value. The cooperation with other institutions provides a setting for institutional learning and an exchange of experience. How one approaches a topic, which method one chooses, and how a project is framed is highly contextual. Input from and discussions with other practitioners are mutually beneficial. It broadens the perspectives applied to the problems at stake and can shed light on overlooked sides of an issue. The networks can also strengthen capacity, both of the institutions and the PTA community as a whole: for PTA units with limited resources, the contact with other units enhances their portfolio and broadens their field of expertise and range of methods. This was the leading idea for the joint TA projects carried out within the framework of PACITA, which was very much appreciated as a means of integrating TA in their portfolio by PACITA partners from countries with no existing TA infrastructures so far. Within the PACITA framework different kinds of partners have conducted three exemplary projects using three different methods. The projects on public health genomics, the future of ageing, and sustainable consumption should encourage TA activities in several European countries, including in those that do not yet have an established TA institution. PACITA has also created the TA Portal, which is an open resource for knowledge sharing and learning about TA.

More than ever, technological change is being driven by and is itself a driving force of globalisation. Therefore, it is logical that the assessment of new technological developments also adapts to the international or European level through networks and cooperation. European science policy has made a move from "science in Europe" to "European science" (Nedeva/Stampfer 2012). The focus has moved from the coordination of national projects, to the development of a more integrated, pan-European science base. Signs for this shift may be seen in the establishment of the European Research Area (ERA) and the European Research Council (ERC). Given this shift, it is getting even more important for TA to be present on a European level.

4 Whom to Address?

One of the main characteristics of many European TA units with a central role in their national context is their strong connection to the parliament. This is institutionally provided for by organizing the unit *inside* parliament (the parlia-

mentary committee or parliamentary office models) (STOA 2012) or by identifying parliament as the main addressee in the mission statement of a TA institution (independent institute model) (Ganzevles/Nentwich 2014). Nevertheless, many of the PTA units additionally communicate their results to a larger audience consisting of different target groups including the scientific community, ministries or other governmental offices and the general public.

When the PTA activities move up to the European level, it becomes more difficult to identify addressees and potential target groups. If a contractual relationship is established with a policy making institution (the European Parliament in the case of ETAG or the Commission in the case of EU-funded projects), there is a TA client, and thus an addressee, with identifiable expectations and needs. However in the case of bottom up activities of cross-European TA initiated by EPTA, the addressee in the first instance would be the interested European public. Brussels serves as an important policy arena, with many important target groups within the EU represented. While in a national context there is a defined public sphere, there is no easily addressable "European public".

Given this situation and knowing about the importance of a clear addressee as a prerequisite for having an impact, there is a clear need for cross-European TA to actively explore ways of identifying and establishing contacts with addressees and target groups at the European level. First of all, a thorough dissemination strategy is needed in cross-European projects. Every project has to identify its own public, which most likely will be quite different from project to project. Second, it could be productive to have a more systematic view of addressees and target groups when working at the European level than at the national/regional level. If the goal of PTA is to provide input for knowledge-based decision-making, it might help to broaden the definition of who decision-makers really are. In a national context, the parliament and government stand out as the main decision-makers. In the European context, the European Commission and the European Parliament play important roles. Yet many others (e.g. lobbyists, NGOs, and the media) also take part in decisions and hold power in important discussions.

5 What Does It Mean to "Go European"?

For many PTA units, doing national projects and participating in European projects creates tension. Easing this tension might be one of the factors that can lower the threshold for doing cross-European TA. This tension is rooted in the fact that the mission of PTA institutions is mainly national in focus. Thus, participating in European projects might take both focus and resources away from their working programs. Therefore, providing sufficient additional resources from European funds for cross-European activities can be one important factor in lowering the threshold for national bodies to engage in European activities. The increasing participation in EU-funded projects also supports this notion. Institutions easily see the added value of joining a consortium when there are special funds available for working at the European level.

However, a strong argument can be made that cross-European TA may be stronger if there is structural financing for European cooperation which is not limited to individual projects. The opportunity to really establish cross-European TA as a field, and having the finances to the keep up the work, might make the European sphere more enticing. Long-term presence and more structural financing by a European programme or body would be an incentive for more cross-European work.

Being part of a European network is in itself of great value to many institutions. It gives input and updates both on topics of interest and developments in the field of TA. Networks like EPTA strengthen the position of TA in Europe and the rest of the world. Through EPTA and initiatives like PACITA, countries and institutions that seek to establish PTA structures can get access to a larger group of PTA units and to possibilities for mutual learning. Nevertheless the barriers described above have hindered a more vital development of cross-European TA.

6 Conclusions: The Need for Structural Financing and Organisational Representation of Cross-European TA

There are many arguments that prove the added value of doing cross-European work in the field of TA. Some of them are: mutual organisational learning; broadening the portfolio of members; being responsive; acting cost-efficiently; and being present at the relevant political level. But there are also some barriers: the difficulty to find the right addressee; the difficulty in making an impact on the European level; and the tension that can arise between the national/regional structures and resources when participating in cross-European work. The most striking seems to be the absence of a European actor and of structural funds for TA. When aiming at a broader range of decision-making processes in Europe, the European Parliament (and STOA) are important actors in the field. To foster cross-European collaboration we need a broader range of settings for collaboration and being open for additional addressees besides the EP. Establishing stronger TA across borders depends on several factors, some of which are structural, external factors, and some are factors that the institutions involved can influence themselves.

External factors: The biggest external challenge is financing. There is a need for more structural form of financing of cross-European activities. Participation beyond single projects would help to establishing TA as a stronger source for advising European decision-making and would encourage institutions to commit themselves for a longer term. In order to acquire these funds, we envisage a European TA stakeholder, who would be present "in Europe" and whose tasks would be to (i) lobby for funds in the long run and (ii) to help European TA institutions to get funds from existing programmes for the envisaged cross-European TA in the short term. Whether this European TA stakeholder could be a stronger EPTA or a new kind of TA association is an open question. Anyhow, there is a need for an organisational push for cross-European TA.

Internal factors: Successful projects are probably the best encouragement for setting up new projects. To achieve this and to adapt to the European level, there are certain internal factors the institutions should consider on the project level. Being used to working in an interdisciplinary field, applying a wide range of methods, and involving different groups of people, TA institutions are well prepared for cooperation with different institutions and across borders. However, one area that is particularly complex at the European level is the communication and dissemination of the projects' results. To have an impact, the addressee and potential target groups must be defined explicitly for each project. This takes time and effort, but will prove useful both during the project and when communicating the message in the end.

For many TA units and their funders, the best use of their resources has been on the national or regional level, where their main tasks and addressees are located. To overcome the tension that might occur between the national/regional and the European levels, there are several things to consider. First, if a more structural form of financing would be established, cross-European work would not take away resources dedicated to the national or regional level. Second, the exchange of knowledge that occurs in cooperation might actually save resources. If an institution has done work in a specific area, others should not be afraid to use the experience and knowledge already produced in this specific field. To participate in European networks and common projects can provide institutions with valuable knowledge.

Partners in the PACITA project have set up working groups that will explore the opportunities for establishing a European TA association. Taking a more inclusive and diverse approach is something that might help create a stronger TA community in Europe. Including institutions beyond parliamentary TA (like in the German context) will broaden the field and create a stronger basis for having an impact on decision-making on the European as well as the national/regional levels.

Having an impact on decision-making and knowledge production in Europe should be the overall goal of European TA organisations. This demands more activity by them and a strong presence in the European arena.

Notes

1) This paper is based on work done for the EU funded project PACITA (Parliaments and Civil Society in Technology Assessment).
2) For a more thorough description of the different TA institutions, see Ganzevles/van Est 2012 and Ganzevles et al. 2014, also: van Est et al. in this volume.
3) Including partners from EPTA and STOA that are not active partners in PACITA.
4) Detailed case descriptions can be found in the annex of the PACITA project deliverable D2.4 "Making cross European TA" at: http://www.pacitaproject.eu/wp-content/uploads/2014/11/PACITA-D-2-4_Cross-European-TA_FINAL_incl-annex.pdf (download 15.12.14).
5) ETAG is led by ITAS and consists of the following partners: DBT, Rathenau Institute, Fraunhofer ISI, FCRI, ITA, VITO, Technology Centre ASCR and Responsible Technology SAS (http://www.itas.kit.edu/english/etag.php).
6) DESSI: Decision Support System for Security Decisions. The DESSI project provides a process and a decision support system to end users of security investments. The system gives insight into the pros and cons of specific security investments. It contributes to a transparent and participatory decision-making that accounts for context and multi-dimensionality of society (http://securitydecisions.org/).
7) SurPRISE: Surveillance, Privacy and Security: A large scale participatory assessment of criteria and factors determining acceptability and acceptance of security technologies in Europe (http://surprise-project.eu/).
8) PACITA: Parliaments and Civil Society in Technology Assessment: Broadening the knowledge base in policy making. PACITA is a four-year EU financed project under FP7 aimed at increasing the capacity and enhancing the institutional foundation for knowledge-based policy-making on issues involving science, technology and innovation, mainly based upon the diversity of practices in Parliamentary Technology Assessment (PTA) (http://www.pacitaproject.eu/).

References

Barland, M.; Peissl, W.; Bütschi, D. et al., 2012: Making Cross-European TA. PACITA, Deliverable 2.4

Ganzevles, J.; van Est, R.; Nentwich, M., 2014: Embracing Variety: Introducing the Inclusive Modelling of (Parliamentary) Technology Assessment. In: Journal of Responsible Innovation 1/3 (2014), pp. 292–313

Ganzevles, J.; van Est, R. (eds.), 2012: TA Practices in Europe. PACITA, Deliverable 2.2; http://www.pacitaproject.eu/wp-content/uploads/2013/01/TA-Practices-in-Europe-final.pdf (download 11.12.14)

Nevada, M.; Stampfer, M., 2012: From "Science in Europe" to "European Science". In: SCIENCE 336 (2012), pp. 982–983

STOA – Science and Technology Options Assessment, 2012: Technology Across Borders. Exploring the Perspectives for Pan-European Parliamentary Technology Assessment; http://www.europarl.europa.eu/RegData/etudes/etudes/join/2011/482684/IPOL-JOIN_ET%282011%29482684_EN.pdf (download 11.12.14)

Vig, N.J.; Paschen, H., 1999: Parliaments and Technology. The Development of Technology Assessment in Europe. New York

Wennrich, Chr., 1999: European Parliamentary Technology Assessment Network (EPTA). In: Bröchler, S.; Simonis, G.; Sundermann, K. (eds.): Handbuch der Technikfolgenabschätzung. Berlin, pp. 535–537

Contact

Dr. Walter Peissl
Institute of Technology Assessment
of the Austrian Academy of Sciences
Strohgasse 45/5, 1030 Vienna, Austria
Email: wpeissl@oeaw.ac.at

« »

NACHRUF

Weiter Denken

Ein Vorruf anstelle eines Nachrufs auf den großen Soziologen Ulrich Beck (gestorben am 1. Januar 2015)

von Stefan Böschen, ITAS

In unnachahmlicher Weise hat Ulrich Beck auf dem Soziologiekongress 2014 unter dem Titel „Sinn und Wahnsinn der Moderne“ eine Laudatio auf Zygmunt Baumann gehalten, welcher von der Deutschen Gesellschaft für Soziologie für sein Lebenswerk geehrt wurde. Im Nachhinein liest sich diese Laudatio beinahe wie sein eigenes Vermächtnis. Ulrich Beck betonte hierbei vor allem den Mut und die Kreativität im Denken Baumanns. Denn er verfüge über die Fähigkeit, grundlegenden Wandel von Gesellschaften zu denken, gerade im Anblick unübersichtlicher Verhältnisse. Im Gegensatz dazu hätten vergleichbar berühmte Soziologen oder Sozialphilosophen wie Michel Foucault, Niklas Luhmann oder auch Pierre Bourdieu „end-of-history“-Theorien entworfen. In ihnen komme es zu einem „alternativlosen Fortschreiten und Fortschreiben der Gegenwart“, obgleich sich doch die gegenwärtige Welt wieder in eine *terra incognita* verwandle. Deshalb sei das grundlegende Problem einer „Soziologie der Transformation“ nach Beck das folgende: „Die Theoretisierung von Transformation erfordert eine Transformation der Theorie“ – bzw. genauer des Theorieverständnisses. Diese These hat er in den vergangenen Jahren mit seinem Programm kosmopolitischen Denkens entfaltet – begleitet hat sie ihn seine ganze akademische Laufbahn. Freundschaften und Feindschaften haben sich an dieser Denkfigur entzündet. In der deutschen Soziologie taten sich Gräben auf. „Reine Theorie“ wurde oft und lautstark gegen „reine Zeitdiagnose“ ins Feld geführt. Beck hat wie kaum ein anderer die paradigmatischen Spannungen in der Zunft provoziert und deren diskursiven Wirkungen selbst auch erlitten. Durch seinen Tod fällt ein wichtiger Provokateur und markanter Bezugspol im soziologischen Feld weg.

Die Erschütterungen für die Disziplin werden erst im Lauf der Zeit spürbar werden, die persönliche ist es freilich jetzt schon. War man mit Ulrich Beck gemeinsam in ein Nachdenken vertieft, dann bestimmte die Ahnung den Moment, dass es hier um nichts anderes als Entscheidendes ging. Im Zentrum stand eine ungeheure Kraft zur Synthese, wie er sie mit seinem Buch Risikogesellschaft beispielgebend offenbart hat. Sie war im Gespräch und den wissenschaftlichen Debatten immer präsent und bildete ein wesentliches Moment seiner Faszination. Kaum konnte man sich dem Sog seiner Imaginationskraft, der Wachsamkeit für die Beobachtung und Deutung oder seiner Freude an treffenden Kennzeichnungen entziehen. Von nur wenigen DenkerInnen kann man aufrichtig sagen, dass man immer genährt und gestärkt das Gastmahl des Denkens verließ.

Denker ehrt man bekanntlich durch Weiterdenken. Wenn ich also einen Nachruf an dieser Stelle schreibe, dann deshalb, um diesem Weiterdenken einen ersten Anstoß zu geben. In diesem Sinne handelt es sich also gar nicht um einen Nachruf, sondern um einen „Vorruf“, obgleich die Bezüge zur Technikfolgenabschätzung (TA) nicht auf der Hand liegen. Denn TA, welche van den Daele einmal treffend durch ihre konstruktive Langweiligkeit gekennzeichnet sah, steht auf den ersten Blick in Distanz zum Denken von Ulrich Beck. Becks Denken strebte danach, die Paradoxien und Verwerfungen gegenwärtiger gesellschaftlicher Entwicklungen durch Zuspitzungen, Pointierungen und eine literarisch anmutende Artikulation auf den Begriff zu bringen. TA hingegen ist bestrebt, Begeisterungs- wie Besorgnisgeschichten im Innovationshandeln zu verstehen, die darin liegenden Erwartungen zu bewerten, Optionen herauszustellen und diese politisch entscheidungsfähig zu machen. Eines solchen Programms Tugend ist es, Pointierungen im Dienst wertungsneutraler Transparenz zu vermeiden. Diese Spannung darf aber nicht über wesentliche Bezüge hinwegtäuschen. Ulrich Beck hat dezidiert auf das Problem hingewiesen, dass das einfache Mehr an Wissenschaft, Technolo-

gie, Recht und Organisation nicht schon automatisch zu einem Mehr an Entwicklung, Wohlstand und Demokratie führt, sondern oftmals zu neuen Nebenfolgen. Deshalb bedürfe es reflexiver Optionen, um die Lernfähigkeit zu erweitern. In diesem Sinne muss die Diagnostik von Beck als ein Stachel für die theoretische wie praktische Positionierung von TA im Diskurs über Technikfolgen angesehen werden, da sie aufgrund ihrer eigenen Geschichte dieser Steigerungslogik an Rationalität verpflichtet wurde.

Welche Facetten des Weiter-Denkens mit Beck zeigen sich nun für die TA? Skizzenhaft möchte ich drei Punkte ansprechen. Die erste Facette besteht darin, die eigene zeitdiagnostische Sensibilität zu kultivieren. Wie kann in Gesellschaften, in denen etablierte Wissensordnungen aufbrechen und erodieren, öffentlich-politisch über Innovationen und ihre Folgen nachgedacht sowie demokratisch entschieden werden? Diese Frage ist von allergrößtem Belang. Die zweite Facette zielt auf die Transformation der Theorie, welche damit beginnt, den Rahmen paradigmatischer Entscheidungen zu erkennen. Ein so ambitioniertes Projekt wie die TA trifft dieses Problem in besonderer Weise, da sie sich ihrer theoretischen Vorannahmen und wertenden Vorurteile deutlicher als alle anderen Wissenschaftsvorhaben bewusst sein muss, um als Forschung den wissenschaftlichen sowie als Beratung den öffentlich-politischen Anforderungen immer wieder neu gerecht werden zu können. Die dritte Facette besteht in einem konsequent transnationalen, insbesondere auch europäischen Blickwinkel. Stand bei Beck am Anfang das risikogesellschaftliche Programm, so war es in den letzten Schaffensjahren das kosmopolitische, um den methodologischen Nationalismus wissenschaftlicher wie politischer Ansätze zu kritisieren und zu überwinden. Auch TA vollzieht eine Europäisierung, wie etwa mit dem PACITA-Projekt, das sich den Möglichkeiten von parlamentarischer TA in verschiedenen europäischen Ländern zuwendet. Aber diese Europäisierung von TA sollte darüber hinaus auch Impulse für die Gestaltung des Projekts Europa enthalten. In diesem Sinne ist es z. B. für TA unzureichend, das deutsche Projekt Energiewende für sich zu analysieren und zu begleiten, vielmehr muss es darum gehen, die Maßnahmenphantasie für ein europäisches Projekt Energiewende zu beflügeln. Dieses Nachdenken macht die zentrale Frage für TA sichtbar: Welche Rolle kann TA in den gegenwärtigen Transformationsgesellschaften spielen und wie muss sie sich für diese Rolle rüsten?

Die skizzenhaften Überlegungen verdeutlichen, dass bei aller Trauer eines solchen Abschieds ein Raum der Besinnung eröffnet wird. Besinnung, wie sie Heidegger bestimmte als den Mut, die Wahrheit der eigenen Voraussetzungen und den Raum der eigenen Ziele zum Fragwürdigsten zu machen. Darin ist der Abschied ein Neubeginn, der Nachruf ein Vorruf.

« »

DISKUSSIONSFORUM

Mit grüner Biotechnologie zum größten Glück der größten Zahl?

Ein Gedankenspiel zur doppelten Profitabilität gentechnisch veränderter Pflanzen

von Christian Berkenkopf, Ruhr-Universität Bochum

Hinsichtlich der Frage einer Technikfolgenabschätzung ist zu diskutieren, ob der Anbau von gentechnisch veränderten Pflanzen überhaupt zulässig ist. Viel ist in diesem Feld bereits geschrieben worden, doch wird zumeist ausgeblendet, dass gentechnisch veränderte Pflanzen in globaler Perspektive bereits in großem Stil angebaut werden. Dieser Essay stellt die provokante Frage, was gedacht werden muss, damit der Anbau gentechnisch veränderter Pflanzen doppelt profitabel gestaltet werden kann: einerseits mit ökonomischem, andererseits mit wohlstandsorientiertem Nutzen. Die Überlegungen zu einem globalen „Health Impact Fund" sollen als Modell für die grüne Biotechnologie adaptiert und diskutiert werden.

1 Grüne Biotechnologie als Thema der Ethik

Die ethischen Fragen zur grünen Biotechnologie sind komplex, und es ist nicht einfach, sich in der Debatte um eine Technik zu verorten, von der sich die Befürworter „das Paradies" versprechen, „während die Gegner die Hölle prophezeien" (Korthals 2003, S. 354). Denn Gentechnik in der Pflanzenzüchtung stellt für den einen eine Verbesserung der Natur dar, für den anderen ist sie eine unzulässige Grenzüberschreitung. Eindrucksvoll liest sich in diesem Zusammenhang die Übersicht zu den unterschiedlichen Begründungsansätzen ethischer Argumentation in Christian Kummers Ausführungen zur Pflanzenwürde. Demnach sind holistische, anthropo-, ratio-, patho-, bio- und theozentrische Begründungen sowie Ansätze in Orientierung an der Kategorie pflanzlicher ‚Natürlichkeit' letztlich nichts anderes als egozentrisch begründete Denkfiguren: „Ich selber werde im Umgang mit meiner Zimmerpflanze zum moralischen Objekt, weil es gut für mich ist, im Eingehen auf ihre Bedürfnisse Tugenden wie Sorgfalt und Rücksichtnahme zu (re-)aktivieren" (Kummer 2013, S. 29).

Fragen wir einmal anders und nehmen die Beobachtung Kummers auf. Weil offenbar die Diskussion ohne egozentrisch motivierte Denkmuster nicht auszukommen scheint und den Menschen als solchen immer und unmittelbar betrifft: Warum fragt in der Debatte niemand, wie sich in der Frage, ob man nun gentechnisch veränderte Pflanzen anbaut oder nicht, das größte Glück der größten Zahl erreichen lässt? Hängt nicht die Beantwortung dieser Frage auch damit zusammen, wie wir den Anbau von gentechnisch veränderten Pflanzen mit einer Vorstellung von Gerechtigkeit zusammenbringen?

Dieser Beitrag diskutiert die Anwendung von gentechnisch veränderten Pflanzen folgenorientiert, also nicht im Sinne eines prinzipiellen „Ob", sondern im Sinne eines an Anwendungskonsequenzen orientierten „Wie": „Whether […] we articulate the task in utilitarian, in Kantian, or in other terms, the claims of justice and of beneficence for the two cases are similar" (O'Neill 1996, S. 109). Denn außerhalb der Europäischen Union kommen gentechnisch veränderte Pflanzen bereits in hohem Maße zur Anwendung. Und obwohl Anwendung noch kein Argument für Erlaubtheit darstellt, soll hier einmal vom Faktum der Anwendbarkeit ausgegangen werden. Viele der bekannten gentechnisch veränderten Pflanzen dienen direkt oder indirekt der menschlichen Ernährung, und sofern die Zulassung (in der Regel außerhalb der EU) erfolgt ist, werden sie auf Freilandflächen angebaut. Hier ergeben sich Wechselwirkungen zwischen den gentechnisch veränderten Pflanzen und anderen Organismen, und diese Wechselwirkungen betreffen auch den Menschen. Dabei sind nicht nur medizinische Zusammenhänge angesprochen, sondern auch juristische, ökologische, ökonomische und viele mehr.

Unter welchen Bedingungen erscheint der Gebrauch gentechnisch veränderter Pflanzen moralisch gerechtfertigt? Lässt sich durch den Anbau von gentechnisch veränderten Pflanzen

ein höchster Nutzen für die größte Zahl erreichen? Was ist zu tun, damit die grüne Biotechnologie im besten Sinne jedermann nützt? Erste Hinweise und Antwortversuche hierzu finden sich etwa in Klaus Hahlbrocks anthroporelationalen Kriterien (Hahlbrock 2007, S. 308; vgl. ähnlich Strünck 2006, S. 189):

Erstens: Bei der Anwendung grüner Biotechnologie muss der Erhaltung einer lebensfähigen Biosphäre oberste Priorität zukommen. Damit ist zum einen angesprochen, dass grüne Biotechnologie nicht zur Umweltverschmutzung (etwa durch CO_2-Emission) beiträgt, sondern sie im Gegenteil zu verhindern hilft. Zum anderen muss eine Pflanze danach beurteilt werden, inwieweit durch ihren Anbau Pestizide und Herbizide zum Einsatz kommen, die wiederum die Biosphäre ungünstig beeinflussen. Sollten sich bei herbizidtoleranten und insektenresistenten Pflanzen langfristig keine Unempfindlichkeiten einstellen, sind sie bezüglich des Arguments der Biosphäre positiv zu werten. Prinzipiell positiv zu werten ist jede Form der ökologischen, d. h. nichtindustriellen Landwirtschaft, da hier Schädlingsbekämpfungsmittel nur begrenzt eingesetzt werden, was sich jedoch negativ hinsichtlich der Ernteerträge auswirkt.

Zweitens: Durch den Einsatz grüner Biotechnologie muss die menschliche Ernährung in quantitativer und qualitativer Hinsicht sichergestellt sein. Neben Maßnahmen zur Ertragssicherung sind dabei besonders Maßnahmen zur Ertragssteigerung angesprochen, die bislang jedenfalls für gentechnisch veränderte Pflanzen noch nicht beobachtet werden konnten (Sauter 2008, S. 9). Das Problem erfährt zusätzliche Brisanz durch die steigende Nachfrage nach Lebensmitteln (bedingt durch das weltweite Bevölkerungswachstum) bei gleichzeitiger Verringerung der zur Verfügung stehenden landwirtschaftlichen Nutzflächen (Engelmann et al. 1996, S. 8f., 39f.). Hier scheinen gentechnisch veränderte Pflanzen ebenfalls ein Ausweg zu sein, wenn selbst unter extremen klimatischen Voraussetzungen hohe Ernteerträge erwartbar wären. Schließlich muss auch thematisiert werden, zu welchem Zweck eine Pflanze gezüchtet und angebaut wird: Handelt es sich um Pflanzen zur Nahrungsmittel- oder zur Energiegewinnung? Hier wäre den Nahrungsmittelpflanzen der Vorrang einzuräumen.

Drittens: Grüne Biotechnologie sollte einen Beitrag zu Vorsorge und Erhaltung der menschlichen Gesundheit leisten. Es muss also wenigstens ein Nachweis erbracht werden, dass Anbau und Verzehr von gentechnisch veränderten Pflanzen keine negativen gesundheitlichen Folgen haben, und dieser Nachweis muss eine langfristige Perspektive abdecken können (van den Daele 1999, S. 266f.). Ergebnis der Langzeittests kann freilich auch die Befürwortung von gentechnisch veränderten Pflanzen sein, insofern sie z. B. Mangel- oder Fehlernährung effektiv und nachhaltig beseitigen können. Weil sich diese Ergebnisse in der Regel mittels konventioneller Züchtungsverfahren nicht erreichen ließen, wäre auch hier im besten Falle die Gentechnik zu befürworten.

Viertens: Grüne Biotechnologie muss für die Beachtung des Artenschutzes in Bezug auf Pflanzen und Tiere sensibilisiert sein. Bei ‚konventionellen' Pflanzen stellt sich die Frage, wie die Auswirkungen durch Dünger und Schädlingsbekämpfungsmittel zu beurteilen sind, bei gentechnisch veränderten Pflanzen muss die Frage der Auswilderung und der Auskreuzung und die Frage der Toleranz und Resistenz gegenüber nicht gentechnisch veränderten Organismen reflektiert werden; auch muss dafür Sorge getragen werden, dass sich nicht eine erfolgreiche Sorte monokulturartig durchsetzen kann, sondern dass Biodiversität in gewissem Maße erhalten bleibt.

Fünftens: Beim Vertrieb von mithilfe grüner Biotechnologie hergestellten Produkten ist dafür zu sorgen, dass die Menschenrechte im Allgemeinen geachtet werden. Übergeordnetes Ziel ist dabei der Zugang zu Bildung, landwirtschaftlicher Nutzfläche, Wasser und Saatgut. Auf positive ökonomische Effekte und indirekte Einflüsse auf das regionale Wohlstandsniveau durch gentechnisch veränderte Pflanzen (z. B. Bt-Baumwolle in Indien) weisen Qaim/Subramanian (2010) hin, und es bedarf der Diskussion, inwiefern diese Effekte langfristig anhalten. Zugleich setzt der Anbau von gentechnisch veränderten Pflanzen ein hohes Wissen um die Technik voraus, es müssen bei dem gewählten Saatgut die passenden Komponenten zur richtigen Zeit eingesetzt werden, und dieses Wissen kann bei Kleinbauern in Entwicklungsländern nicht unbedingt vorausgesetzt werden. Hinzu kommt, dass einige gentechnisch veränderten

Pflanzen nicht für den Einsatz auf kleinen Parzellen angelegt sind, sondern eine großflächige Bewirtschaftung mit einem hohen technischen Einsatz erforderlich machen (HT-Mais). Dabei sind v. a. wirtschaftspolitische Sujets zu problematisieren, besonders die Abhängigkeit der Kleinbauern von Komplettlösungen der Saatgutkonzerne, die den optimalen Mix aus Saatgut, Dünger und Schädlingsbekämpfung exklusiv anbieten und Kleinbauern gelegentlich in eine umfassende Abhängigkeit bringen (was nicht selten den Vorwurf neoimperialistischer Ambitionen einbringt). Diese Tendenz wird durch internationale Abkommen wie TRIPS (Trade-Related Aspects of Intellectual Property Rights) verstärkt, wonach Pflanzenbestandteile durch Patente geschützt werden können, was im Extremfall dazu führen kann, dass Kleinbauern ein traditionelles, indigenes Getreide nicht mehr anbauen dürfen, sondern lizenzpflichtig bestellen müssen. Insbesondere dieser Punkt bedarf einer Diskussion, denn ohne TRIPS verändern zu wollen und zu können, stellt sich doch die Frage, ob man die Rahmenbedingungen nicht so anpassen kann, dass wenigstens die problematischen Aspekte von TRIPS aufgefangen werden.

2 Thomas Pogge und Health Impact Fund (HIF)

In einem anderen Kontext, jedoch ebenfalls mit Bezug auf TRIPS, schlagen der Ökonom Aidan Hollis und der Philosoph Thomas Pogge mit dem Health Impact Fund (HIF) ein Modell zum globalen Umgang mit patentgeschützten Medikamenten vor. Der HIF bezeichnet ein System, das Anreize zur Entwicklung und Vermarktung von Medikamenten setzt, die das Interesse an Profitmaximierung seitens der pharmazeutischen Industrie mit den Vorsorge- und Behandlungsbedürfnissen von weniger konsumkräftigen Teilen der Weltbevölkerung verbinden könnten. In Pogges eigenen Worten handelt es sich um einen jährlichen „Forschungswettbewerb, der sich auf alle Länder und alle Krankheiten erstreckt und Forschungsergebnisse gemäß ihrer Gesundheitsauswirkungen belohnt“ (Pogge 2011c, S. 276). Das Konzept geht jedoch über einen bloßen Wettbewerb hinaus, denn Pogge verspricht sich von der Initiative (finanzielle) Anreize für pharmazeutische Innovationen, und diese Innovationen würden gemäß ihrer globalen Gesundheitswirkung beurteilt und zum niedrigsten möglichen Verkaufspreis gehandelt (Banerjee et al. 2010, S. 166).

Ausgangspunkt dieser Überlegungen ist die Beobachtung, dass Medikamente in der Regel zu einem hohen Preis verkauft werden. Zwar rechtfertigen die Hersteller ihre Preisgestaltung durch hohe Forschungs- und Entwicklungskosten, nach Ansicht Pogges bleiben jedoch die langfristigen Produktionskosten, die im Normalfall deutlich geringer sind, in der Kalkulation unberücksichtigt. Patente auf Arzneimittel sollen das innovative Produkt schützen und garantieren, dass die Entwicklungskosten durch den Verkauf ausgeglichen werden. Die Folge seien, so Pogge, hohe Gewinne und eine willkürliche Preisgestaltung, und dies sei insofern problematisch, als damit besonders Menschen in Entwicklungsländern vom Zugang zu wirksamer Medizin ausgeschlossen sind: „billions of human beings are too poor to afford medicines at monopoly prices and thus cannot share the benefit of a patent regime“ (Pogge 2011b, S. 245).

Pogges Situationsanalyse lässt sich wie folgt zusammenfassen (vgl. Pogge 2011b, S. 246f.): Patentierte Medizin wird in der Regel unter dem Maßstab der Profitmaximierung verkauft, wodurch die Bewohner der Entwicklungsländer ausgeschlossen, d. h. als Zielgruppe uninteressant werden. Also existieren nur wenige Anreize zur Herstellung kurativ und präventiv wirksamer Medikamente, denn Produkte etwa gegen Haarausfall und Akne sind lukrativer. Zudem dürfte es einen Markt für gefälschte Präparate geben, deren Wirksamkeit nicht gewährleistet ist. Es entstehen unnötige Kosten durch nationale Zulassungsverfahren und durch Marketing, die in die Preisgestaltung der Medikamente einfließen. Schließlich existiert das Problem der letzten Meile, d. h., man weiß aktuell nicht, ob ein Medikament gemäß der Herstellerangaben eingenommen wird. Pogge schlussfolgert deshalb: „the existing international practices and global institutional order must count as unjust and their continued imposition as a harm done to the world’s poor“ (Pogge 2011b, S. 244).

Die Initiative in Form des HIF reagiert auf diese Analyse (Pogge 2011b, S. 247f.; Pogge 2011c; Banerjee et al. 2010, S. 166f.): Der HIF ist gedacht als eine überstaatliche Einrichtung, die global agiert und durch öffentliche Haushalte fi-

nanziert wird. Der Hersteller eines Medikaments kann nun sein Produkt (optional) beim HIF registrieren und geht damit die Verpflichtung ein, das Produkt zu dem niedrigsten möglichen Preis (einkalkuliert die Kosten für Produktion und Vertrieb) zu verkaufen. Im Gegenzug erhält er für einen fixen Zeitraum (zehn Jahre) eine Vergütung aus dem Fond, deren Höhe sich an den weltweit in qualitätskorrigierten Lebensjahren (QALY) messbaren Gesundheitswirkungen orientiert.[1] Nach Ende des Lizenzierungszeitraums müssten die Lizenzen für Herstellung und Handel mit Generika bereitgestellt werden. Die Initiative hat nach Pogge den Vorteil, dass sie pharmazeutische Innovationen fördert, wenig anfällig für Beeinflussung (weil nicht krankheitsspezifisch) ist, Anreize für die optimale Einnahme eines Medikaments setzt, den gesundheitlichen Impact stärker als bisher berücksichtigt und Vergleiche diverser Medikamente zulässt. Weil der HIF eine doppelte Profitabilität fördert (ökonomisch und gesundheitlich), liegt das Interesse des Arzneimittelherstellers v. a. darin, dass viele Menschen von seinen Produkten profitieren, denn der HIF setzt Anreize für die tatsächliche Wirksamkeit von Medikamenten. Es kommen verstärkt die Interessen der Entwicklungsländer in den Blick, da dort viele Menschen an Krankheiten leiden, die zu erforschen derzeit nicht lukrativ erscheint. Werbung für Medikamente wird überflüssig, für Fälschungen gibt es keinen Anreiz, da Medikamente zu günstigen Preisen nach Wirksamkeit verordnet werden. Schließlich muss es im Interesse des Herstellers liegen, seine Medikamente auch sinnvoll eingenommen zu sehen, weil die Zuteilung aus dem Fond davon abhängt. Selbst die Steuerzahler aus den Industrienationen (die für die Anschubfinanzierung sorgen müssten) profitierten letztlich von langfristig niedrigeren Arzneimittelpreisen.

Unabhängig davon, inwieweit das Konzept praktikabel erscheint und welche Probleme sich in der Durchführung ergeben (eine Systematisierung der Kritik an Pogges Modell findet sich z. B. bei Liddell 2010), darf an dieser Stelle die (ethisch relevante) Frage thematisiert werden, ob der HIF nicht auch ein Modell für die Anwendung der grünen Biotechnologie sein kann und ob ein analog zum HIF entworfenes Konzept die strukturelle Ungerechtigkeit in Bezug auf TRIPS und die Anwendung von gentechnisch veränderten Pflanzen überwinden hilft.

3 Gedankenspiel zur doppelten Profitabilität gentechnisch veränderter Pflanzen

Ist der HIF anwendbar auf die grüne Biotechnologie? Thomas Pogge selbst regt in anderen Kontexten eine *Global Resources Dividend* und einen *Ecological Impact Fund* an, also hält er sein Konzept auch an vergleichbare Sachverhalte anpassbar (Pogge 2010, S. 539–542; Pogge 2011a, S. 336). Kann es eine überstaatliche Regulierung der grünen Biotechnologie geben, wie müsste etwa ein *Food Impact Fund* oder ein *Welfare Impact Fund* konkret aussehen? Hahlbrocks anthroporelationale Kriterien (s. o.) könnten hier als Grundlage dienen und mit Blick auf Thomas Pogges HIF eingepasst werden. Die Frage ist, wem die grüne Biotechnologie nützen soll und wie man mit ihr das größte Glück der größten Zahl erreicht, ohne im besten Fall jemanden schlechter zu stellen.

Es ist klar, dass grüne Biotechnologie – und hier im Besonderen die gentechnisch veränderten Pflanzen – an die Erhaltung einer lebensfähigen Biosphäre geknüpft sein muss, dass darüber hinaus die menschliche Ernährung in quantitativer wie in qualitativer Hinsicht gesichert sein muss, dass die menschliche Gesundheit nicht beeinträchtigt werden darf, dass weitere Pflanzen und Tiere nicht zu Schaden kommen dürfen und dass Menschenrechte nicht missachtet werden dürfen. Damit liegen die Analogien auf der Hand: Besonders in den Entwicklungsländern fehlt es u. a. an Nahrungsmitteln; die mit TRIPS verbundene Patentierung von pflanzlichem Genmaterial und die in der Folge als Produkt verkaufte gentechnisch veränderte Pflanze schaffen Abhängigkeiten von monopolähnlichen Saatgutkonzernen. Schließlich sind die Kosten für Entwicklung, Vermarktung und Zulassung von gentechnisch veränderten Pflanzen immens hoch, was sich auf den Preis des Produkts auswirkt, solang es durch Patente geschützt ist. Es bietet sich daher an, abschließend ein Modell für den Anbau und die Entwicklung von gentechnisch veränderten Pflanzen zu entwerfen.

Ein möglicher Welfare Impact Fund (WIF) müsste wie auch der HIF global agieren, denn nur in einer globalen Perspektive erweist er sich als

sinnvoll. Gentechnische oder biotechnologische Innovationen könnten dann ebenso optional registriert werden, was zur Folge hätte, dass für einen festgelegten Zeitraum eine Vergütung aus dem Fond erfolgen müsste. In diesem Zeitraum müsste das Produkt weltweit zum niedrigsten möglichen Herstellungspreis verkauft werden, und die Vergütung aus dem Fonds würde sich nach den Auswirkungen auf das Wohlstandsniveau richten. Am Ende des ‚Patentschutzes' müssten dann die Lizenzen wieder freigegeben werden.

Was ist der Vorteil des Konzepts gegenüber bisherigen Lösungen? Bisher sind Langzeittests v. a. das Mittel der Wahl, ohne den Test ist die Zulassung einer gentechnisch veränderten Pflanze nahezu unmöglich. Der wirtschaftliche Handel mit gentechnisch verändertem Saatgut ist basal durch TRIPS geregelt, unterliegt ansonsten jedoch den Bestimmungen von Angebot und Nachfrage sowie den Produktionsbedingungen einschließlich der wirtschaftlichen Profitabilität. Hier könnte der WIF entscheidende Anreize bezüglich einer doppelten Profitabilität setzen, d. h., es kämen wirtschaftliche und wohlstandsorientierte Gründe ins Spiel. Bei der Ausschüttung aus dem Fond müssten dann Hahlbrocks anthroporelationale Kriterien einbezogen werden: Wie wirkt sich eine gentechnisch veränderte Pflanze betreffend der Biosphäre aus? Welcher Beitrag ist für die qualitative wie quantitative Sicherung der menschlichen Ernährung erreicht worden? Ist die menschliche Gesundheit durch das Produkt gefährdet oder wird sie unterstützt? Ist der Artenschutz im Hinblick auf Tiere und andere Pflanzen gewährleistet? In welchem Maße bleibt Biodiversität erhalten? Sind die Menschenrechte geachtet und berücksichtigt, zum Beispiel mit Blick auf Zugang zu Saatgut und zu Bildung („Wie baue ich das Produkt an?")? Wird mit dem von mir hergestellten Saatgut auch wirklich ein optimaler Erfolg erzielt? Und die Befriedigung welcher Bedürfnisse verspricht schließlich die effektivste Wirkung auf das weltweite Wohlstandsniveau?

Zugegeben, der hier skizzierte WIF verspricht noch deutlich komplexer zu werden als der von Pogge und Hallis vorgeschlagene HIF. Unmittelbare Auswirkungen auf das Wohlstandsniveau wären schwerlich durch QALYs zu erfassen, Kriterien zur Vergütung aus dem WIF müssten noch ausgehandelt und definiert werden. Zudem würde immer der Verdacht im Raum stehen, der WIF hielte eben nur Regulierung und Bürokratie bereit, könne aber keinen substanziellen Beitrag etwa zur Besserung der Welternährungssituation leisten. Immerhin erlaubt jedoch der WIF als ein Gedankenspiel, Sachverhalte globaler Verteilungsungerechtigkeiten zu benennen und über ihre Beseitigung nachzudenken, ohne den Status quo mehr als nötig infrage zu stellen. Der WIF wäre ein gigantisches Experiment, und er könnte, wenn er funktioniert, zur Lösung einer der relevantesten Fragen des 21. Jahrhunderts beitragen, nämlich zur Frage gleichberechtigter und gerechter Teilhabe am Wohlstand, besonders hinsichtlich der Welternährung.

Anmerkung

1) Faktoren der Beurteilung sind klinische und anwendungsbezogene Tests und statistische Erhebungen über die Korrelation von Einnahme des Produkts und Entwicklung der Krankheit.

Literatur

Banerjee, A.; Hollis, A.; Pogge, T., 2010: The Health Impact Fund: Incentives for Improving Access to Medicines, In: Lancet 375/9709 (2010), S. 166–169

Engelmann, R.; *LeRoy, P.*; *Vetter, H.*, 1996: Mensch, Land! Report über Weltbevölkerungsentwicklung und nachhaltige Nahrungsproduktion. Hannover

Hahlbrock, K., 2007: Kann unsere Erde die Menschen noch ernähren? Bevölkerungsexplosion, Umwelt, Gentechnik. Frankfurt a. M.

Korthals, M., 2003: Grüne Gentechnik. In: Düwell, M.; Steigleder, K. (Hg.): Bioethik. Eine Einführung. Frankfurt a. M., S. 354–362

Kummer, C., 2013: Pflanzenwürde, In: Stimmen der Zeit 138/1 (2013), S. 21–30

Liddell, K., 2010: The Health Impact Fund: A Critique. In: Pogge, T.; Rimmer, M.; Rubenstein, K. (Hg.): Incentives for Global Public Health. Patent Law and Access to Essential Medicines. Cambridge, UK, S. 155–180

O'Neill, O., 1996: Ending World Hunger. In: Aiken, W.; LaFollette, H. (Hg.): World Hunger and Morality. Upper Saddle River, N.J, S. 85–112

Pogge, T., 2010: Keynote Address: Poverty, Climate Change, and Overpopulation, In: Georgia Journal of

International & Comparative Law 38/3 (2010), S. 525–542

Pogge, T., 2011a: Allowing the Poor to Share the Earth, In: Journal of Moral Philosophy 8 (2011), S. 335–352

Pogge, T., 2011b: The Health Impact Fund: How to Make New Medicines Accessible to All. In: Benatar, S.R.; Brock, G. (Hg.): Global Health and Global Health Ethics. Cambridge, S. 241–250

Pogge, T., 2011c: Weltarmut und Menschenrechte. Kosmopolitische Verantwortungen und Reformen. Berlin

Qaim, M.; Subramanian, A., 2010: Benefits of Transgenic Plants: A Socioeconomic Perspective. In: Kempken, F.; Jung, C. (Hg.): Genetic Modification of Plants. Agriculture, Horticulture and Forestry. Berlin, S. 615–629

Sauter, A., 2008: Transgenes Saatgut in Entwicklungsländern. Erfahrungen, Herausforderungen, Perspektiven. Berlin

Strünck, C., 2006: Die Macht des Risikos. Interessenvermittlung in der amerikanischen und europäischen Verbraucherpolitik. Baden-Baden

van den Daele, W., 1999: Von rechtlicher Risikovorsorge zu politischer Planung. Begründungen für Innovationskontrollen in einer partizipativen Technikfolgenabschätzung zu gentechnisch erzeugten herbizidresistenten Pflanzen. In: Bora, A. (Hg.): Rechtliches Risikomanagement. Form, Funktion und Leistungsfähigkeit des Rechts in der Risikogesellschaft. Berlin, S. 259–289

Kontakt

Dr. Christian Berkenkopf
Lehrstuhl für Dogmatik und Dogmengeschichte
Kath.-Theol. Fakultät
Ruhr-Universität Bochum
GA 7/33, Universitätsstr. 150, 44801 Bochum
Tel.: +49 234 32-22454
E-Mail: christian.berkenkopf@rub.de

« »

Technikethische Werte im Konflikt – Das Beispiel des Körperscanners

von Thilo Hagendorff, Internationales Zentrum für Ethik in den Wissenschaften

Die Entwicklung technischer Artefakte ist immer von Werten beeinflusst, welche in die Technik eingeschrieben werden, jedoch in der späteren Anwendung der Technik schwierig erkennbar und kaum mehr verhandelbar sind. Exemplifiziert wird dies im folgenden Aufsatz an Körperscannern, einer relativ neuen Sicherheitstechnologie, deren Einsatz nicht-intendierte Nebenfolgen mit sich bringt, welche wesentliche technikethische Fragen aufwerfen. Körperscanner konstruieren durch häufige Fehldetektionen „auffällige“ oder „gefährliche“ Personen. Fehldetektionen entstehen, wenn die Körper der zu scannenden Personen „inkompatibel“ sind mit dem seitens der Technik vorgegebenen Normalkörperschema. Werte, welche in diesem Fall die Physiognomie und die Form des menschlichen Körpers betreffen, härten in der Technik aus und machen sich über sie geltend. Technik autorisiert somit die Entmächtigung der mit ihr konfrontierten Personen, was im Endeffekt in der handfesten Verletzung von Persönlichkeitsrechten enden kann.

1 Technikethische Abwägungsprozesse

Eine Definition von Technik lautet, Technik bestimme sich durch die Gesamtheit derjenigen Verfahren und Einrichtungen, welche Handlungszusammenhänge derart anreichern, dass Tätigkeiten in ihrer Wirksamkeit gesteigert werden können (Rammert 1999, S. 3f.). Diese Wirksamkeitssteigerungen, mit denen Technologien im Allgemeinen beworben werden, sind jedoch abhängig davon, welchen Standpunkt man ihnen gegenüber einnimmt. Was sich auf der einen Seite als technikbedingte Wirksamkeitssteigerung, als Vereinfachung oder Ermöglichung neuer Fertigkeiten niederschlägt, kann auf der anderen Seite das genaue Gegenteil bedeuten. Während Technologien das Erreichen von Zwecksetzungen vereinfachen können, können sie es ebenfalls

erschweren oder sich sogar über letztere hinwegsetzen. Pessimistische Technikauffassungen fokussieren ebensolche Verselbständigungsdynamiken technischer Apparate. Optimistische Technikauffassungen dagegen betonen durch Technologien bedingte Vorteile und Nutzengewinne. Letztlich müssen beide Ansätze verfolgt werden, um in Wertekonflikten, welche im Kontext neuer Technologien entstehen, adäquat vermitteln zu können. Schließlich jedoch ist nicht auszuschließen, dass technische Artefakte in bestimmten Handlungszusammenhängen in vielerlei Hinsicht mehr ein Hindernis darstellen, als dass sie förderlich wirken würden. Hier setzen technikethische Abwägungsprozesse an, die wir im Folgenden am Beispiel des Körperscanners durchspielen.

Körperscanner, auch Terahertz-Detektionssysteme genannt und als Sicherheitstechnologie zumeist an Flughäfen eingesetzt, erstellen ein detailliertes Abbild der Körperoberfläche unter der Kleidung, um dort versteckte, potenziell gefährliche Gegenstände zu finden (Bellanova/Fuster 2013). Körperscanner erkennen, im Unterschied zu Metallscannern, Sprengstoffe und anderes nicht-metallisches Gefahrengut wie etwa Keramikmesser. Zudem bieten sie raschere Abwicklungszeiten für die Sicherheitskontrollen, eine gegenüber Metallscannern verringerte Notwendigkeit, zu kontrollierende Personen abzutasten und damit eine geringere Gefahr der Krankheitsübertragung.

Auf einem Display am Körperscanner wird dem Sicherheitspersonal zumeist statt dem „nackten“ Körper, also dem Millimeterwellenbild, ein neutrales Körperpiktogramm angezeigt, auf welchem eventuelle Funde durch Farbflächen hervorgehoben werden. Diesem Piktogramm liegt – je nach eingesetzter Software – über bestimmte Kontrastfolien ein Hintergrundschema eines symmetrischen Normalkörpers zugrunde. Im Fall eines von diesem Normalkörper abweichenden oder asymmetrischen Körperbildes wird aufgrund der fehlenden Deckungsgleichheit der seitens der Technik vorgegebenen Normalkörper-Kontrastfolie mit dem Bildkontrast des abweichenden Körperbildes, etwa aufgrund einer am Körper getragenen Pistole, ein Alarm ausgelöst. Der Alarm zwingt betroffene Personen dazu, in der Nachkontrolle offenzulegen, weshalb Alarm ausgelöst wurde, indem sie Gefahrengut oder verbotene Gegenstände ablegen müssen oder – was um einiges häufiger vorkommen wird – indem sie somatische Abweichungen offenlegen, aufgrund derer der Körperscanner fälschlicherweise Alarm geschlagen hat.

2 Werteinschreibungen in die Technik

Die neue Technologie der Terahertz-Detektionssysteme bietet für bestimmte, im Folgenden diskutierte Personengruppen gravierende Nachteile, welche sowohl im Entwicklungsprozess wie auch bei der Verbreitung und dem Einsatz der Geräte nicht ausreichend berücksichtigt wurden. „Is the security solution worth it? In other words, is the benefit of mitigating the risks worth [...] the other trade-offs?“ (Schneier 2003, S. 15) Körperscanner verstärken Sicherheitsbemühungen, indem sie sicherstellen, dass nicht nur metallische, sondern auch nicht-metallische gefährliche Gegenstände bei der Sicherheitskontrolle detektiert werden können. Der durch Körperscanner versprochene Mehrwert an Sicherheit muss jedoch im Verhältnis zu den Einschränkungen anderer Werte betrachtet werden, beispielsweise die Stigmatisierung nicht-normgerechter Körper als potenziell gefährliche Körper. Die nicht-intendierten Nebenfolgen, welche der Einsatz von Körperscannern mit sich bringt, wiegen schwer und geben Anlass zu der Vermutung, dass sie generell gegen den Einsatz der Sicherheitstechnologie Körperscanner sprechen.

Bei der Anwendung von Körperscannern wird der Code Gefahr/Nicht-Gefahr auf den Körper projiziert. Dabei definiert ein scheinbar nach objektiven Kriterien agierendes technisches Artefakt, wann der Wert Gefahr selegiert und damit ein weiterer, tiefergehender Zugriff auf den Körper autorisiert wird. Der Zugriff auf den Körper ist gleichsam ein Eingriff in die Intim- und Privatsphäre der betroffenen Person, welcher in vielen Fällen erstens aufgrund der Falschalarme ungerechtfertigt ist und welcher zweitens schwerwiegende emotionale Folgewirkungen mit sich bringen kann. Gerade die häufigen Fehldetektionen von Körperscannern deuten darauf hin, dass die „unpassenden“, „auffälligen“ oder „gefährlichen“ Menschen durch die Technik überhaupt

erst auf ungerechtfertigte Weise geschaffen werden (Ammicht Quinn 2014, S. 37). Die Technik tritt hier also plötzlich als ein Intermediär auf, hinter dem reale soziale Akteure und ihre Werte zurücktreten, zum Beispiel die Akteure aus den entwickelnden Technikbereichen, aus der Politik oder aus der Wirtschaft und ihren Lobbys.

Auf Seiten der Technikentwicklung müssen solche Gegebenheiten berücksichtigt werden, wie u.a. McCarthy und Wright fordern: „[...] those who design, use, and evaluate interactive systems need to be able to understand and analyze people's felt experience with technology." (McCarthy/Wright 2004, S. IX) Anstatt technische Artefakte als solche isoliert und somit als neutrale Dinglichkeit zu betrachten, setzen technikethische Erwägungen Techniken in den Kontext ihrer anwendungsbezogenen gesellschaftlichen Auswirkungen. „Technisches Handeln verläuft zwischen Handelnden [...], schutzwürdigen Gütern, moralischen Schutzbefohlenen („moral patients") und Ko-Subjekten. In jeweiligen Situationen vermag man einzelne Aspekte herauszuheben; immer aber bleibt die gesamte mehrstellige Relation präsent." (Ott 2005, S. 597) Die Technologie Körperscanner bietet hohe Sicherheitsversprechen und eine prinzipiell rasche Abwicklung der Passagierkontrolle. Doch diese Nutzengewinne gehen zulasten von bestimmten Personengruppen, für welche Körperscanner ungerechtfertigter Weise ein Hindernis darstellen. Im System Körperscanner sind, wie in jedem anderen technischen Artefakt auch, bestimmte Werte und Leitbilder eingeschrieben – in erster Linie solche Werte, welche die Physiognomie des menschlichen Körpers betreffen. Zu Konflikten kommt es, wenn diese aus der Welt der Technik stammenden Werte auf gesellschaftliche Werte stoßen, wie etwa die Persönlichkeitsrechte auf Schutz von Privatheit sowie auf psychische und emotionale Unversehrtheit.

3 Wer definiert den gefährlichen Körper?

Während in zwischenmenschlicher Kommunikation Werte hervorgehoben, über sie debattiert und deren Kontingenz betont werden kann, lösen sie sich in der Interaktion mit technischen Artefakten gewissermaßen auf und entziehen sich in problematischer Weise der Verhandelbarkeit, ohne dabei jedoch ihre Geltungskraft einzubüßen. Das heißt, dass wertebedingte Präferenzstrukturen nach wie vor greifen und man sich auf sie berufen kann. Die Technik macht letztlich die in sie eingeschriebenen Werte unsichtbar, wobei sie diese gleichzeitig verhärtet und fixiert. Betritt eine Person eine Körperscanner-Personenkontrolle, muss sie eine bestimmte Normalkörperform besitzen. Hat sie diese nicht, beispielsweise weil sie eine Prothese oder einen Stomabeutel trägt oder nicht eindeutig einem biologischen Geschlecht zugeordnet werden kann, kann sie sich nicht einfach darauf berufen, dass das von der Technik vorgegebene Normalkörperschema der Vielseitigkeit und Kontingenz menschlicher Körperformen nicht gerecht wird und abweichende Körperformen keine Gefährdung darstellen. Das Sicherheitspersonal wird sich diskussionsunbereit und vorschriftsmäßig auf die Anzeige des Körperscanners berufen und bei entsprechender Meldung eine Nachkontrolle durchführen. Dies geschieht unabhängig davon, ob die zu kontrollierende Person eine tatsächliche Gefahr für den Flugbetrieb darstellt oder nicht. Letztlich definiert das technische Artefakt die Situation und lenkt die Handlungen entsprechend.

Aufgrund der Definitionsmacht, welche in der Situation der Sicherheitskontrolle dem Körperscanner zugesprochen wird, kann es zu einer sublimen Entmächtigung der zu kontrollierenden Personen kommen. Bereits Schweißflecken können Falschalarme auslösen, da Terahertz-Wellen von Wasser absorbiert werden. Die Auslöser des Falschalarmes müssen danach durch ein manuelles Abtasten des Körpers offengelegt werden. Bei der Nachkontrolle werden jedoch vermutlich in den seltensten Fällen Sprengstoffe oder Waffen zum Vorschein kommen, sondern eher somatische Abweichungen in Form von Prothesen, Inkontinenzwindeln, Urinbeuteln, künstlichen Darmausgängen etc. Darüber hinaus kommt es zu technisch bedingten Diskriminierungen gegenüber weiteren Personengruppen. Da die Detektionsmechanismen des Körperscanners nicht geschlechtsneutral, sondern gemäß bestimmten männlichen oder weiblichen Normalkörperschemata funktionieren, werden transsexuelle Personen nicht allein formal diskriminiert, sondern evtl. sogar gegen ihren Willen und entgegen dem Anspruch auf Schutz vor Nachforschungen bezüglich des Geschlechts zur

Preisgabe desselben gezwungen. Softwareseitige Maßnahmen, die eine geschlechtsneutrale Operationsweise des Körperscanners ermöglichen, sind mit zusätzlichen Kosten verbunden. Dazu kommt, dass der Scanvorgang um einige Sekunden länger brauchen und somit das Abwicklungstempo an der Sicherheitskontrolle verlangsamt würde. Rentabilität und Effizienz wiegen in einer Werteabwägung also schwerer als der Umstand, dass Menschen mit nicht „normgerechten" Körpern dem Risiko traumatisierender Outingsituationen ausgesetzt werden.

Zusammenfassend kann gesagt werden, dass die Anwendung von Körperscannern einen tiefen Eingriff in persönlichkeitsrelevante Bereiche bedeuten kann. Betroffen sind u. a. Personen mit verdeckten Behinderungen oder mit nicht-normalen Körperbildern. Damit Körperscanner kein ungerechtfertigtes Hindernis darstellen, sollten mehrere Maßnahmen getroffen werden. Es sollte jederzeit die Möglichkeit zum Opt-out gegeben sein. Neben der im Hinblick auf das Recht auf informationelle Selbstbestimmung getätigten Herstellung umfassender Transparenz über die Funktionsweise von Körperscannern sind technische Lösungen anzustreben, welche dem Schutz des Persönlichkeitsrechts dienen, auch wenn dies zu eventuellen Funktionalitätseinschränkungen des Körperscanners führt. Piktogramme, welche das maschinell erhobene, jedoch für das Sicherheitspersonal nicht einsehbare Millimeterwellenbild der Körperoberfläche der zu kontrollierenden Person durch eine bloß schematische Körperskizze substituieren, reduzieren prinzipiell zwar die Eingriffstiefe des Kontrollvorgangs, bieten jedoch sicherlich keinen ausreichenden Persönlichkeitsschutz für die erwähnten Personengruppen. Der Einsatz von Körperscannern darf nicht dazu führen, dass die Grundrechte bestimmter Personen eingeschränkt werden.

4 Wertekonflikte als Technikfolge

Damit Technik derart nicht zum Problem wird, müssen, wie aus den bisher dargelegten Punkten deutlich wird, verschiedene Verträglichkeitsdimensionen technischer Artefakte berücksichtigt werden. Während hier typischerweise Fragen des Umwelt- und Gesundheitsschutzes aufkommen – man denke an die technikethischen Zentralgegenstände Atomenergie und Gentechnik (s. Beitrag von C. Berkenkopf in diesem Heft) –, so sind im Fall des Körperscanners soziale und psychologische Aspekte relevant. Auf Seiten der für die Entwicklung der Sicherheitstechnologie Körperscanner verantwortlichen Ingenieure ist ungeachtet vieler Ingenieurskodizes und Leitsätze eine gewisse Betriebsblindheit zu unterstellen, emotionale, psychische und ideelle Auswirklungen, welche die Technik auf die mit ihr konfrontierten und interagierenden Personen ausübt, in technikseitigen Folgeszenarien zu antizipieren. Daher ist eine systematische Technikbewertung notwendig, welche den Stand der Technik und Entwicklungsmöglichkeiten analysiert sowie eventuelle Wertekonflikte durch Technikfolgen abschätzt. „Attention to the values that are unconsciously built into technology is a very welcome development. At the very least, system designers should consider whose values or what values they implement." (Wallach/Allen 2009, S. 39)

Idealerweise findet eine umfangreiche Technikbewertung während der Forschung zu und der Entwicklung von neuen technischen Geräten statt. Suboptimal ist die rückwirkende Technikbewertung, welche erst dann einsetzt, wenn Forschung und Entwicklung bereits abgeschlossen sind und unter Umständen bereits die Einführung der Technik beschlossen oder umgesetzt ist. Greifen technikethische Bewertungen zu spät und fehlt somit eine Früherkennung von potenziell schädlichen Nebenfolgen der Technikbenutzung, bleibt zumeist nur die Option, mühsam auszuhandelnde, rechtliche Regulierungsmaßnahmen anzuregen (Mieth 1991, S. 223). Technikverträglichkeitstests müssen darauf ausgerichtet sein, dass insbesondere solche Werte darin miteinbezogen werden, welche außerhalb genuin technikzentrierter Wertesettings, bestehend aus Werten wie Funktionalität, Brauchbarkeit, Zuverlässigkeit oder Wirksamkeit, stehen. Darunter sind weniger ökonomische Wertesettings wie Wirtschaftlichkeit, Rentabilität oder Sparsamkeit eines technischen Artefakts zu verstehen als vielmehr Grundsätze des Schutzes der Privat- und Intimsphäre, der freien Persönlichkeitsentfaltung, der Handlungsfreiheit, der informationellen Selbstbestimmung, der sozialen Anerkennung sowie der kulturellen und religiösen

Identität. Daran anschließende Grundwerte sind gewissermaßen Prüfsteine für die Legitimität des Einsatzes technischer Artefakte.

5 Fazit

Sicherheitstechnologien erfordern spezielle Authentifizierungsmaßnahmen. Allerdings dürfen diese Maßnahmen weder schwere Eingriffe in die schutzbedürftige Privat- und Intimsphäre darstellen, noch dürfen sie die freie Entfaltung der Persönlichkeit, die informationelle Selbstbestimmung, die soziale Anerkennung oder die kulturelle und religiösen Identität einer Person verletzen oder einschränken. Sicherheitstechnologien respektive technische Artefakte können demnach über ihre Kontrollfunktion hinaus noch in einem weiteren Sinne zum Hindernis werden. Es geht dann weniger um ungerechtfertigt aufgerichtete physische Hürden als um die Einschränkungen emotionaler und psychischer Unversehrtheit. Wenn man also berücksichtigt, welche Implikationen technische Artefakte mit sich führen, dann scheint es sinnvoll, ein Technikverständnis zu pflegen, welches Techniken nicht isoliert behandelt, sondern sie in ihren sozialen Kontext stellt oder sie gar als soziale Akteure behandelt (Bellanova/Fuster 2013; Latour 2001). So können die bei der Entwicklung technischer Artefakte in ebendiese eingeschriebenen Werte und Normen identifiziert werden, damit gleichsam offenbar wird, wie Techniken diese Werte und Normen umgekehrt zur Geltung bringen. Zudem können sinnvolle Abwägungsprozesse zwischen technischen und außertechnischen Werten durchgeführt werden, wobei die Kontingenz der in technische Artefakte eingeschriebenen Werte hervorgehoben werden kann. Somit können auf der Grundlage ethisch und sozialwissenschaftlich informierter Überlegungen veritable Verträglichkeitstests für technische Artefakte durchgeführt werden, die eine angemessene Verhandlung technischer Anwendungsmöglichkeiten erlauben.

Danksagung

Die Forschung zu diesem Aufsatz findet im Kontext des vom Bundesministerium für Bildung und Forschung geförderten Projekts KRETA (Körperscanner – Reflexion der Ethik auf Technik und Anwendungskontexte) statt.

Literatur

Ammicht Quinn, R., 2014: Sicherheitsethik. Eine Einführung. In: Ammicht Quinn, R. (Hg.): Sicherheitsethik. Wiesbaden, S. 15–47

Bellanova, R.; Fuster, G.G., 2013: Politics of Disappearance. Scanners and (Unobserved) Bodies as Mediators of Security Practices. In: International Political Sociology 7/2 (2013), S. 188–209

Latour, B., 2001: Das Parlament der Dinge: Für eine politische Ökologie. Frankfurt a. M.

McCarthy, J.; Wright, P., 2004: Technology as Experience. Cambridge, MA

Mieth, D., 1991: Wissenschaft – Technik – Ökonomie. Was können wir verantworten? In: Wils, J.-P.; Mieth, D. (Hg.): Ethik ohne Chance? Erkundungen im technologischen Zeitalter. Tübingen, S. 210–224

Ott, K., 2005: Technikethik. In: Nida-Rümelin, J. (Hg.): Angewandte Ethik. Die Bereichsethiken und ihre theoretische Fundierung. Stuttgart, S. 568–647

Rammert, W., 1999: Technik. Stichwort für eine Enzyklopädie (Working Paper); http://www.ssoar.info/ssoar/bitstream/handle/document/881/ssoar-1999-rammert-technik_stichwort_fur_eine_enzyklopadie.pdf?sequence=1 (download 1.12.14)

Schneier, B., 2003: Beyond Fear. Thinking Sensibly About Security in an Uncertain World. New York

Wallach, W.; Allen, C., 2009: Moral Machines. Teaching Robots Right from Wrong. New York

Kontakt

Dr. Thilo Hagendorff
Internationales Zentrum für Ethik
in den Wissenschaften
Wilhelmstraße 19, 72074 Tübingen
E-Mail: thilo.hagendorff@izew.uni-tuebingen.de

« »

TA-PROJEKTE

Neue Wertschätzung für Lebensmittel

Rückblick auf vier Jahre „Runder Tisch“ in Nordrhein-Westfalen

von Sonja Pannenbecker, Ministerium für Klimaschutz, Umwelt, Landwirtschaft, Natur- und Verbraucherschutz des Landes Nordrhein-Westfalen

Das Thema Lebensmittelverschwendung wurde 2010 zum ersten Mal in der breiten Öffentlichkeit diskutiert, u. a. ausgelöst durch die Reportage „Frisch auf den Müll – Wie Lebensmittel verschwendet werden“, ausgestrahlt in der ARD-Themenwoche „Essen ist Leben“ im Oktober 2010, sowie die Veröffentlichung einer Studie der EU-Kommission „Preparatory Study on Food Waste Across EU 27“ (EC 2010). Als erstes Bundesland rief Nordrhein-Westfalen im Dezember 2010 aufgrund des großen Handlungsbedarfes einen Runden Tisch zum Thema „Neue Wertschätzung für Lebensmittel“ ein. Er wurde initiiert durch den Verbraucherschutzminister Johannes Remmel (Bündnis 90/Die Grünen), der in diesem Rahmen zu einem nachhaltigen Konsum aufrief.[1] Beim Runden Tisch in Nordrhein-Westfalen kommen seither jährlich Vertreterinnen und Vertreter aus Landwirtschaft, Einzelhandel, Lebensmittelwirtschaft, Wissenschaft sowie aus Verbraucher- und Wohlfahrtsverbänden zusammen und diskutieren gemeinsam über praktikable Handlungsansätze zur Verringerung der Lebensmittelverschwendung. In Deutschland werden – laut Studien im Auftrag des Bundesministeriums für Ernährung und Landwirtschaft – jährlich mindestens elf Millionen Tonnen Lebensmittel entsorgt (Kranert et al. 2012; Peter et al. 2013).[2]

1 Wegweisende Projekte

Durch den regelmäßigen Austausch mit hochrangigen Vertretern der gesamten Lebensmittelkette sowie den Sekundärmärkten konnten in Nordrhein-Westfalen Kooperationen der unterschiedlichen Akteure gefördert werden, die Öffentlichkeit wurde für das Thema sensibilisiert und politische Entscheidungen wurden initiiert. Exemplarisch sollen hier einige der wegweisenden Projekte, die aus dem Runden Tisch entstanden sind, genannt werden. Sie wurden vom Verbraucherschutzministerium des Landes Nordrhein-Westfalen beauftragt und gefördert:

Im Frühjahr 2012 wurde die gemeinsame Studie der Fachhochschule Münster und der Verbraucherzentrale Nordrhein-Westfalen „Verringerung von Lebensmittelabfällen – Identifikation von Ursachen und Handlungsoptionen in Nordrhein-Westfalen“ vorgestellt.[3] Zudem wurde eine *Studie zu dem Thema Brot und Backwaren* an die FH Münster vergeben, deren Zwischenergebnisse beim Runden Tisch im Herbst 2013 vorgestellt wurden und die Anfang 2015 abgeschlossen sein wird.[4] Die Universität Paderborn entwickelte gemeinsam mit der Verbraucherzentrale einen *Onlinewerkzeugkoffer* für Lehrkräfte an Grundschulen und weiterführenden Schulen in Nordrhein-Westfalen.[5] Der Werkzeugkoffer ist Teil der flankierenden Maßnahmen des EU-Schulobst- und -gemüseprogramms, das in Nordrhein-Westfalen im Schuljahr 2014/2015 in über 1.000 Schulen über 186.000 Schülerinnen und Schüler von Grund- und Förderschulen erreicht.[6] Auch die Station „Lebensmittelretter“ für die interaktive „Ess-Kult-Tour“, durchgeführt durch die Verbraucherzentrale NRW, war Teil dieses Projekts. Die Station vermittelt mit einem Schätzspiel Wissen über die Verlustkette und regt zur „Selbstreflektion mit Kühlschrank und Kochtopf“ an. Diese Station wird sowohl in weiterführenden Schulen ab Klasse sieben als auch bei diversen öffentlichen Veranstaltungen in der Erwachsenenbildung eingesetzt. Die Unterrichtsmaterialien wurden evaluiert und um Module für berufsbildende Schulen erweitert.

Der *studentische Wettbewerb* der Verbraucherzentrale NRW an der Ecosign Akademie für Gestaltung mit dem Titel „Verzehrte Welt“

brachte unterschiedliche Ideen hervor: Von einer Internetplattform zur Nachernte beim Bauern („Stoppeln“) über eine Imagekampagne für den „Doggybag“ für Restaurants („Zehnnachzwei“) bis hin zu humorvollen Videoclips[7] und einem Kartenspiel für Kinder ab sieben Jahre („Duell der Sterneköche“) konnten Preise an junge Studentinnen und Studenten vergeben werden.

Die Mitglieder aus Nordrhein-Westfalen vom „Deutschsprachigen Netzwerk zur Vermeidung von Lebensmittelabfällen“[8], das aus Vertreterinnen und Vertretern der Forschung und Verbraucherinteressen besteht, sind gut in den Runden Tisch eingebunden, so dass Synergieeffekte genutzt werden können. So tagte der Runde Tisch im Rahmen der wissenschaftlichen Tagung „Von der Verschwendung zur Wertschätzung der Lebensmittel – Wissenschaftliche Erkenntnisse und ihre Umsetzung in die Praxis“ des Ministeriums für Klimaschutz, Umwelt, Landwirtschaft, Natur- und Verbraucherschutz des Landes Nordrhein-Westfalen in Kooperation mit dem Netzwerk am 21.11.2014 in Münster.

2 Ziel und Methodik

Ziel des Runden Tisches ist, neben der Vernetzung, dem konstruktiven Austausch und der Förderung von Projekten, die Aufmerksamkeit und die Sensibilität für das Thema Lebensmittelverschwendung und Wertschätzung für Lebensmittel entlang der Lebensmittelwertschöpfungskette zu erhöhen.

Beim zweiten Runden Tisch wurden auf Basis der Ergebnisse der Studie der FH Münster und der Verbraucherzentrale NRW folgende Kernpunkte verabschiedet:

Rahmenbedingungen ändern: Gesetze, Normen, Regeln und Gewohnheiten können an vielen Stellen zu vermeidbaren Lebensmittelabfällen führen. Die Vertreterinnen und Vertreter von Politik, Landwirtschaft und Handel sowie Verbraucherinnen und Verbraucher setzen den Dialog fort und untersuchen gemeinsam die gesetzlichen Vorschriften, die handelsseitigen Normen und Regeln und die Realitäten, Gewohnheiten und Ansprüche der gesamten Wertschöpfungskette hinsichtlich ihrer Relevanz für Lebensmittelabfälle.

Dieser Punkt wird aktuell zum einen durch die Studie der FH Münster zu Brot und Backwaren erforscht, zum anderen wird Verbraucheraufklärung, -sensibilisierung und -bildung seitens der Verbraucherzentrale NRW, der Landfrauenverbände und anhand des Werkzeugkoffers in Schulen in Nordrhein-Westfalen durch Lehrkräfte selbstständig vermittelt. Auch konnte auf dem Runden Tisch 2013 verkündet werden, dass einige Supermarktketten ihre Verträge für Bäckereien hinsichtlich der Fülle des Sortiments am Abend geändert haben. So können Brot- und Brötchenabfälle reduziert werden.

Prozessoptimierung und Stärkung der Schnittstellen: Die Studie der FH Münster und der Verbraucherzentrale NRW zeigt, dass Lebensmittelabfälle innerhalb der Kette nach vorne oder nach hinten verlagert werden, z. B. müssen Landwirte Obst und Gemüse zum Teil entsorgen, da diese den Richtlinien des Handels nicht entsprechen (Göbel et al. 2012). Hier soll die bereits erwähnte Studie zu Brot und Backwaren erste branchenspezifische Handlungsoptionen erarbeiten.

Die Wertschätzung von Lebensmitteln soll erhöht werden: Das Verbraucherschutzministerium forciert Ernährungs- und Verbraucherbildung an Schulen. Es werden und wurden Projekte in diesem Bereich gefördert, wie z. B. das EU-Schulobst- und -gemüseprogramm. Geplant ist eine Veranstaltung im Februar 2015 für alle Schulformen von der Vernetzungsstelle Schulverpflegung in Kooperation mit der Natur- und Umweltakademie NRW in Recklinghausen, bei der Bildungsmaterialien zum Thema Lebensmittelverschwendung und -wertschätzung vorgestellt und die Lehrkräfte für das Thema im Schulalltag sensibilisiert werden. Ein Praxistest und die Evaluierung des entwickelten Werkzeugkoffers wurden bereits erfolgreich abgeschlossen. Die Landfrauen werden auch in Zukunft als Ernährungsbotschafterinnen im Unterricht präsent sein und die Wertschätzung von Lebensmitteln fördern.

Das Verbraucherschutzministerium, die Verbraucherzentrale und der Handel vereinbarten, den Verbraucherinnen und Verbrauchern In-

formationen rund um das Thema Mindesthaltbarkeitsdatum, den Umgang mit Lebensmitteln und praktische Tipps zur Vermeidung von Lebensmittelabfällen zugänglich zu machen. So führte beispielsweise die *REWE*-Tochter *Penny* eine Aktion mit den Landfrauen in *Penny*-Märkten durch. Die Verbraucherzentrale NRW informiert sowohl in diversen Vorträgen als auch anhand eines Flyers über diese Themen.

Regionale Wirtschaftssysteme stärken und Direktvermarktung fördern: Je weniger Schnittstellen in der Wertschöpfungskette vorhanden sind, desto weniger Lebensmittel werden verworfen. Das Ministerium für Klimaschutz, Umwelt, Landwirtschaft, Natur- und Verbraucherschutz des Landes Nordrhein-Westfalen fördert u. a. die Direktvermarktung und regionale Vermarktung von Lebensmitteln auf unterschiedliche Art und Weise. So werden beispielsweise Absatzförderungsmaßnahmen für einzelne Initiativen und Produktgruppen (Kartoffeln, Eier, Spargel) gefördert und das Land gewährt Unterstützung bei der Erarbeitung von Vermarktungskonzepten für landwirtschaftliche Öko- und Qualitätserzeugnisse.[9]

Aufbau von Sekundärmärkten und Ausbau von Nachnutzungssystemen: Auch wenn es vom Runden Tisch begrüßt wird, dass die Zusammenarbeit vom Lebensmitteleinzelhandel, der Lebensmittelbank und sozialen Organisationen wie den „Tafeln" seit Jahren ausgebaut wird, spricht sich der Runde Tisch deutlich für die Primärvermarktung von Lebensmitteln durch Direktvermarkter oder Einzelhandel aus, denn der Staat darf sich nicht aus seiner sozialpolitischen Verantwortung zurückziehen.

Eine Anschubfinanzierung konnte das Ministerium für Klimaschutz, Umwelt, Landwirtschaft, Natur- und Verbraucherschutz des Landes Nordrhein-Westfalen dem Internet-Projekt „Foodsharing.de" gewähren. Es schließt die Lücke der fehlenden Sekundärmärkte zwischen Privatpersonen und kann den nachbarschaftlichen Austausch von Lebensmittelresten wieder beleben.

Stärkung der Forschung: Das Ministerium fördert außerdem verschiedene Forschungsprojekte rund um das Thema Lebensmittelverschwendung. Als Praxispartner des „Deutschsprachigen Netzwerks zur Vermeidung von Lebensmittelabfällen" kann es sich aktiv an der Entwicklung von Forschungsprojekten beteiligen. Bei der oben genannten wissenschaftlichen Tagung trafen Akteure der gesamten Wertschöpfungskette auf Forschende aus den verschiedenen Themenfeldern zusammen. Die Tagung diente als Kontaktbörse, um Unternehmen noch mehr in die Forschung einzubeziehen.

3 Ausblick

Es bedarf eines ausgeprägten Willens, innovativer Ideen und guter Zusammenarbeit sowie starker Vorbilder und Persönlichkeiten, um einen Runden Tisch zum Erfolg zu bringen. Lokale oder regionale Runde Tische können darüber hinaus die Vernetzung der Akteure deutlich erleichtern und so das Schnittstellen-Management verbessern. Wichtig ist bei der Zusammensetzung solcher Runder Tische, die gesamte Wertschöpfungskette sowie Forschende verschiedener Institutionen und Fachrichtungen einzubeziehen. Zudem ist eine vertrauensvolle Diskussionskultur notwendig. Der Runde Tisch „Neue Wertschätzung für Lebensmittel" hat sich in Nordrhein-Westfalen als feste Institution etabliert. Das rege Interesse verschiedener Akteure, sich an den Sitzungen zu beteiligen und die vielfältigen Projekte, die aus dem Runden Tisch entstanden sind, zeigen die Aktualität des Themas und den Bedarf, gemeinsam weiter hieran zu arbeiten. Auch in Zukunft wird es weiterhin notwendig sein, sich zu allen Stufen der Wertschöpfungskette auszutauschen, um so die Reduktionsziele von EU und Bundesregierung bezüglich der vermeidbaren Lebensmittelabfälle zu erreichen. Erste Überlegungen der EU Kommission, verbindliche Ziele über die Lebensmittelabfallreduktion einzuführen, bestärken dies.[10] Auch in den kommenden Jahren wird der Runde Tisch weitergeführt: Diskutiert wird beispielsweise aktuell, wie die Forschung die Datenerhebung in der Wertschöpfungskette verbessern kann.

Wichtig wäre die Entwicklung bundesweiter und europäischer Regelungen zur Vermeidung von Lebensmittelabfällen. Der nordrhein-westfälische Runde Tisch ist daher zunächst eine wirksame Maßnahme, um unter Einbezie-

hung der Öffentlichkeit auf allen Ebenen der Wertschöpfungskette für das Thema zu sensibilisieren sowie die notwendige Vernetzung voranzutreiben.

Anmerkungen

1) http://www.nrw.de/meldungen-der-landesregierung/runder-tisch-neue-wertschaetzung-fuer-lebensmittel-10177/ (download 26.1.15)
2) Dieser Beitrag schließt sich an das Thema des Schwerpunkts „Future Food Systems: Challenges and Perspectives“ sowie zweier Projektberichte in TATuP 3/2014 an.
3) http://www.umwelt.nrw.de/verbraucherschutz/pdf/studie_verringerung_lebensmittelabfaelle.pdf (download 16.1.15)
4) https://www.fh-muenster.de/fb8/personen/profs/ritter.php?anzeige=projekt&pr_id=734 (download 26.1.15)
5) http://www.evb-online.de/schule_materialien_wertschaetzung_uebersicht.php (download 26.1.15)
6) Siehe auch http://www.schulobst.nrw.de (download 26.1.15)
7) http://www.youtube.com/watch?v=5Lgp00CuDcc&list=UUDZ9sZBagqifm3KyYYfCJNQ&index=3 (download 26.1.15)
8) http://www.essens-wert.net (download 26.1.15)
9) http://www.lanuv.nrw.de/agrar/foerderprogramme/pdf/Absatz_Flyer2012.pdf (download 26.1.15)
10) COM(2014)397 final online verfügbar auf http://eur-lex.europa.eu/resource.html?uri=cellar:e669092f-01e1-11e4-831f-01aa75ed71a1.0009.03/DOC_1&format=PDF (download 26.1.15)

Literatur

EC – Europäische Kommission (Hg.), 2010: Final Report: Preparatory Study on Food Waste across EU 27. Technical Report 2010-054

Göbel, C.; Teitscheid, P.; Ritter, G. et al., 2012: Verringerung von Lebensmittelabfällen – Identifikation von Ursachen und Handlungsoptionen in Nordrhein-Westfalen. Studie für den Runden Tisch „Neue Wertschätzung von Lebensmitteln“ des Ministeriums für Klimaschutz, Umwelt, Landwirtschaft, Natur- und Verbraucherschutz des Landes Nordrhein-Westfalen. Münster

Kranert, M.; Hafner, G.; Barabosz, J. et al., 2012: Ermittlung der weggeworfenen Lebensmittelmengen und Vorschläge zur Verminderung der Wegwerfrate bei Lebensmitteln in Deutschland. Stuttgart

Peter, G.; Kuhnert, H.; Haß, M. et al., 2013: Einschätzung der pflanzlichen Lebensmittelverluste im Bereich der landwirtschaftlichen Urproduktion. Bericht im Auftrag des Bundesministeriums für Ernährung, Landwirtschaft und Verbraucherschutz (BMELV). Braunschweig

Kontakt

Sonja Pannenbecker
Referat VI-1 Haushalts- und Querschnittsaufgaben, Ernährungspolitik und nachhaltiger Konsum
Ministerium für Klimaschutz, Umwelt, Landwirtschaft, Natur- und Verbraucherschutz des Landes Nordrhein-Westfalen
Schwannstr. 3, 40476 Düsseldorf

« »

Neue „Schlappen“ im Familiennetz

von Tobias Kopp, HTW Karlsruhe, Institut für Lernen und Innovation in Netzwerken, und Jürgen Schöchlin, HTW Karlsruhe, Fachbereich Wirtschaftsinformatik

Das Thema „Ambient Assisted Living“ (AAL) ist seit Jahren in aller Munde: Wie können altersgerechte Assistenzsysteme Hilfsbedürftige im Alltag möglichst unauffällig unterstützen? Trotz hoher Marktpotenziale, ist der AAL-Markt bisher noch schwach ausgebildet und kaum erschlossen. Dies ist v. a. darauf zurückzuführen, dass ältere Menschen sich als heterogene und schwer zugängliche Zielgruppe erweisen. Darüber hinaus existiert wenig wissenschaftliche Literatur, die sich mit der Einführung von AAL-Produkten beschäftigt. In diesem Artikel werden empirische Untersuchungen – basierend auf einem Mixed-Method-Ansatz – und Handlungsempfehlungen zur Markteinführung von AAL-Produkten am Beispiel eines sog. „intelligenten Hausschuhs“ vorgestellt. Die empirischen Ergebnisse aus Experteninterviews sowie einer online-Befragung von 256 Familienangehörigen von Senioren sind teilweise abweichend von der Literatur und zeigen neue Einsichten.

1 Ausgangslage

Vor dem Hintergrund des demografischen und sozialen Wandels der deutschen Gesellschaft wird davon ausgegangen, dass der Markt für altersgerechte Assistenzsysteme erhebliche Umsatzpotenziale bietet und die Senioren zu einer der einflussreichsten Konsumentengruppen aufsteigen werden. Der Bedarf an effizienteren Formen der Pflege älterer Menschen hat in Kombination mit den dazu notwendigen technologischen Fortschritten das neue Forschungsgebiet „Ambient Assisted Living“ (AAL) geschaffen.

Doch gerade ältere Menschen erweisen sich als heterogene und schwer zugängliche Zielgruppe. Die Markteinführung technologisch neuartiger Produkte gilt grundsätzlich als herausfordernd. Im AAL-Segment müssen zusätzlich noch spezifische Barrieren überwunden werden. In der Konsequenz ist der theoretisch so attraktive Markt bisher noch schwach ausgebildet bzw. kaum erschlossen.

Am Beispiel eines neu entwickelten AAL-Produkts „FamilyNet“ der Firma Xybermind (www.xybermind.net) vergab die Baden-Ambulanz gGmbH eine Masterarbeit im Fachgebiet Wirtschaftsinformatik an der Hochschule Karlsruhe – Technik und Wirtschaft. Dabei sollte in erster Linie die zu erwartende Marktakzeptanz des Produkts evaluiert und geeignete Marketingkonzepte identifiziert werden.

2 Produktkonzept

Bei dem in Entwicklung befindlichen Produkt handelt es sich um einen „intelligenten“ Hausschuh (Abb. 1). Dieser führt über eingebaute Sensoren eine Ganganalyse durch und berechnet Parameter wie Aktivität, Gesundheitszustand und Sturzrisiko, die dann an ein Smartphone übermittelt werden. Kritische Abweichungen im Tagesverlauf oder Stürze eines Benutzers lösen Alarmmeldungen an ein Smartphone oder einen sonstigen Webclient aus. Ein Alarm kann sowohl automatisch als auch manuell erzeugt werden. Bei der automatischen Erzeugung kommen statistische Methoden zum Einsatz, die Abweichungen vom normalen Tagesablauf erkennen und bewerten. Die manuelle Erzeugung von Notsignalen erfolgt durch besondere Fußbewegungen wie z. B. ein Aneinanderschlagen der Füße.

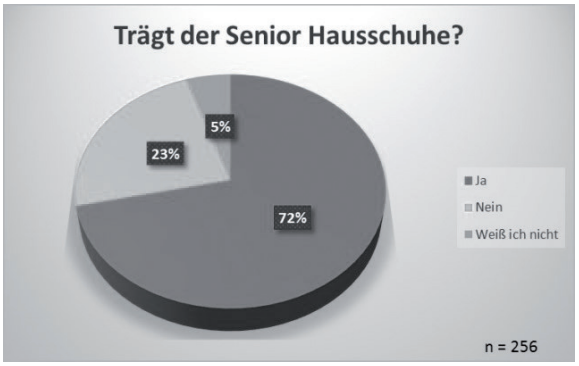
Abb. 1: Prototyp eines intelligenten Hausschuhs

Quelle: Richard Feichtinger, Xybermind GmbH/Inshoerance Tübingen; http://inshoerance.net/achillex/aims-sensoren/

Die ermittelten Parameter stehen ausgewählten Familienangehörigen der Senioren, über vergangene Zeiträume rückverfolg- und vergleichbar, auf dem Smartphone zur Verfügung. Das weitere Vorgehen im Falle kritischer Abweichungen liegt primär in deren Hand, z. B. ein telefonischer Rückruf, eine Verständigung von Nachbarn oder auch die Alarmierung eines Notfalldienstes.

Der Hausschuh als Ort für den Sensor wurde aus mehreren Gründen gewählt: Zum einen wird er nach unseren eigenen Untersuchungen besonders von älteren Menschen tatsächlich regelmäßig benutzt (Kopp/Schöchlin 2014; s. Abb. 2), zum anderen ist die Anbringung am Fuß zur Berechnung der verwendeten Parameter für den Gesundheitszustand und die Sturzgefahr erforderlich. Eine Schuhsohle bietet genügend Platz für die Sensorik, die drahtlosen Kommunikationssysteme zu einer in der Wohnung platzierten Basisstation sowie für den Akku, der drahtlos mittels einer speziellen Fußmatte geladen werden soll.

Abb. 2: Das Trageverhalten von Hausschuhen bei Senioren



Quelle: Kopp/Schöchlin 2014

Die Verarbeitung der Messdaten baut auf teilweise patentgeschützten Algorithmen der Herstellerfirma des Prototyps auf, die zuvor bereits in anderen Systemen erfolgreich zum Einsatz gekommen sind. Bei der Schritterkennung wird zwischen den Zuständen „Stehen“, „Gehen“ und „Laufen“ mit einer hohen Sensitivität unterschieden. Die Parameter „Gesundheitszustand“ und „Sturzrisiko“ leiten sich aus der Schritterkennung ab und werden während des Gehens ermittelt. In einer Lernphase (ca. 1 Woche) werden die Aktivitäten pro Wochentag statistisch erfasst. Um Auffälligkeiten zu erkennen, werden die Daten standardisiert (Oppenheim/Schafer 2004). Dies stellt sicher, dass ein Ausbleiben von stark regelmäßigem Verhalten mit kleiner Standardabweichung stärker in die Berechnung eingeht. Aktive Verhaltensweisen, wie z. B. Stehen oder Gehen haben von vornherein ein stärkeres Gewicht als passive wie z. B. Sitzen.

3 Empirische Untersuchung

Die empirische Untersuchung folgte dem Mixed-Method-Ansatz (Johnson/Onwuegbuzie 2004). Im qualitativen Teil wurden zwölf Experteninterviews mit Senioren, betreuenden Angehörigen und Vertretern des Gesundheits-und Pflegewesens durchgeführt. Letztgenannte Gruppe setzte sich zusammen aus einem Hausarzt, einer Mitarbeiterin der Sozialstation, einer Beraterin im Pflegestützpunkt, einer AAL-Beraterin und einer Leiterin eines Seniorenzentrums. An die qualitative Untersuchung schloss sich eine online-Befragung von Personen an, die einen Senior privat unterstützen (Stichprobe n=256).

3.1 Expertenbefragung

Die Angehörigen der Senioren berichteten in der Expertenbefragung, dass sie den Unterstützungsbedarf der Senioren häufig realistischer einschätzen als die Betroffenen selbst. Letztere haben große Schwierigkeiten, sich ihr hohes Alter und die damit verbundenen Einschränkungen einzugestehen. Beim Kauf neuer Produkte entscheiden Angehörige maßgeblich mit. Dennoch müssen auch die Senioren vom Kauf eines neuen Produkts überzeugt sein, wovon grundsätzlich nicht ausgegangen werden kann. Gegenüber Neuerungen wie einem intelligenten Hausschuh zeigen sich die Senioren erst einmal skeptisch. Ursächlich hierfür sind v. a. Bedenken gegenüber einer grundsätzlichen Überwachung des Tagesablaufs. Angehörige und Senioren schätzen den Hilfebedarf oft unterschiedlich ein und haben verschiedene Bedürfnisse und Nöte. Ferner zeigte die Befragung, dass Angehörige bei jeglichen Neuerungen, seien es neue Produkte oder neue Abläufe, auf eine charakteristische, ablehnende Haltung

der Senioren treffen und viel Überzeugungsarbeit leisten müssen, bevor Neuerungen akzeptiert werden. Trotz der anfänglichen Ablehnung sind die Senioren in der Retrospektive häufig froh über die neuen Hilfsmittel. Eine interviewte Expertin aus dem Pflegewesen sieht in dieser Haltung keine spezifische Aversion gegenüber Technik, sondern begründet diese mit der mentalen Unbeweglichkeit der Senioren.

An die gesetzlichen Pflegeberatungsstellen nach § 7a SGB XI (Sozialgesetzbuch) wenden sich oftmals Angehörige, die teils weit entfernt wohnen und den Eindruck haben, der Senior brauche Hilfe, wolle diese aber nicht annehmen. Grundsätzlich agieren die Angehörigen nur selten proaktiv, sondern gestehen sich die steigende Problematik möglichst lange nicht ein. Wenn ein aktives Eingreifen in die Pflege und Versorgung des bedürftigen Seniors nicht mehr zu vermeiden ist, wird die Situation dann häufig als überfordernd empfunden. Gerade solche Angehörige, die sich alleine um den Senior kümmern, sind häufig hochgradig psychisch belastet (Schneekloth/Leven 2003). Zum einen ist ihre Arbeitslast real dadurch erhöht, dass sie dem Senior diejenigen Tätigkeiten abnehmen müssen, die dieser nicht mehr eigenständig bewältigen kann. Zum anderen sind die Angehörigen emotional überfordert, müssen eine große Verantwortung tragen, der sie sich nicht immer gewachsen fühlen und leben teilweise in ständiger Sorge. Neben der Unkenntnis über die teilweise gesetzlich zustehenden Angebote an Beratungs- und Hilfsleistungen scheinen die Angehörigen teilweise gehemmt, diese zu beanspruchen und können sich ihre eigene Hilfsbedürftigkeit ebenfalls schlecht eingestehen.

3.2 Online-Umfrage

Eine bisher in dieser Art und Weise nicht dokumentierte Erkenntnis der durchgeführten Online-Umfrage ist die Tatsache, dass die Mehrheit der Senioren regelmäßig Hausschuhe trägt (Abb. 2). Dies ist erstaunlich, da bisherige Studien davon ausgingen, dass in der Gruppe der über 65-Jährigen nur zwischen 18 % und 42 % Hausschuhe tragen (White/Mulley 1989; Dunne et al. 1993; Munro/Steele 1999). Dabei war noch nicht berücksichtigt, ob die Hausschuhe regelmäßig getragen werden und ob es sich immer um das gleiche Paar Schuhe handelt. Unsere Untersuchungen zeigen, dass 91 % der Senioren (n=179) stets das gleiche Paar Hausschuhe tragen und 82 % (n=152) diese auch beim nächtlichen Toilettengang benutzen (Kopp/Schöchlin 2014).

Trotz des vorhandenen Schuhwerks stürzen Senioren recht häufig, was zumeist gesundheitliche Folgen hat. Allerdings bleiben sie nur selten hilflos und unentdeckt liegen. Die Sturzproblematik spielt v.a. emotional eine große Rolle.

Die Angehörigen bilden ein breites Spektrum an verschiedenen Individuen ab und agieren daher auch entsprechend unterschiedlich. Angesichts der geringen Änderungsbereitschaft, der Selbstüberschätzung und der augenscheinlich vorherrschenden Stigmatisierung des Alt-Seins verwundert es wenig, dass in der Regel nicht die Senioren selbst, sondern deren Angehörige als Nachfrager von Beratungs-, Unterstützungs-und Pflegeleistungen auftreten.

4 Schlussfolgerungen

4.1 Zielgruppen

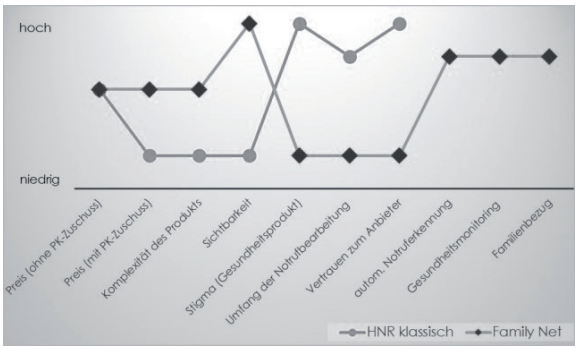
Als wesentliche Zielgruppe für den intelligenten Hausschuh „FamilyNet“ wurden alleinlebende Senioren mit strukturierten Tagesabläufen identifiziert, die als potenziell sturzgefährdet einzustufen sind. Diese verlassen das Haus bzw. die Wohnung eher selten, sind aber nicht ans Bett gebunden. Die Angehörigen sind hoch motiviert, sich um diese Senioren zu kümmern. Dabei ist es nicht entscheidend, ob die Angehörigen in der Nähe oder weiter weg wohnen.

Entscheidende Voraussetzung bei dem untersuchten Produkt ist, dass die Senioren bereit sind, regelmäßig Hausschuhe zu tragen. Dies konnte bei einer großen Mehrheit der Befragten bestätigt werden.

Ansonsten spielt es keine Rolle, ob die Senioren aus der genannten Zielgruppe in der eigenen Wohnung, einer Einrichtung des betreuten Wohnens oder in einer Pflegeeinrichtung leben. Im Bereich stark dementer Senioren oder wenn die Betroffenen das Bett kaum noch verlassen können, bietet das Produkt allerdings keinen eindeutigen Nutzen mehr. Gemeinsam lebende Paare

sind der Ansicht, dass sie selbst gut genug aufeinander aufpassen können und interessieren sich daher nur in Ausnahmefällen für „FamilyNet“.

Abb. 3: Die Nutzenkurve von FamilyNet nach der Blue Ocean-Methode im Vergleich zu den bekannten Hausnotrufsystemen



Quelle: Kopp/Schöchlin 2014

4.2 Vertrieb

Grundsätzlich zeigen unsere Untersuchungen, dass die potenziellen Kunden den Vertrieb durch einen möglichst ortsnahen Fachhändler bevorzugen, da dieser auch später bei Rückfragen kontaktiert und eingebunden werden kann. Bei größeren Elektronikdiscountern werden AAL-Produkte von Betroffenen oder Angehörigen bisher nicht vermutet. Der Vertrieb über das Internet ist für Senioren im Moment noch unvorstellbar. Da Angehörige indes vereinzelt auf diesen Kanal zurückgreifen, ist eine Tendenz zum Ausbau des Online-Vertriebs zu beobachten.

Abgesehen von den stark spezialisierten Vertriebsquellen wie Elektronikfachhändler oder Orthopädiefachhändler spielt das Sanitätshaus insbesondere für medizinisch-pflegerische Produkte eine exponierte Rolle. Die in unserer Studie befragten Experten erwarteten, dass dort allgemein AAL-Produkte, insbesondere sog. Hausnotrufgeräte aber auch das „FamilyNet“, gekauft werden können. Die befragten Senioren waren meist schon einmal in einem Sanitätshaus, z. B. zum Kauf eines Rollators. Das Angebot von Beratungs- und Wartungsleistungen ist den potenziellen Kunden wichtig. Zum Kauf eines Hausnotrufgerätes verweisen professionelle Experten aktuell indes noch gerne an klassische Hilfsorganisationen wie DRK oder ASB.

Insgesamt zeigte sich bei allen befragten Experten eine gewisse Unsicherheit, wo einzelne Produkte zu vermuten sind. Offenbar hat sich im zweiten Gesundheitsmarkt noch keine klare Struktur für Vertriebskanäle ergeben.

4.3 Strategische Empfehlungen

Zur Ableitung von strategischen Empfehlungen wurden in der Studie die Blue Ocean-Strategie (Kim/Mauborgne 2005) und der Universal Design-Ansatz (Story 1998) als besonders geeignete Konzepte identifiziert und angewandt. Die Suche nach einem unberührten „blauen Ozean“ – also einem noch nicht erschlossenen Marktsegment – vermeidet eine wenig aussichtsreiche Konkurrenzsituation zu bereits etablierten Hausnotruf-Systemen. Wie dies gelingen kann, zeigt die Nutzenkurve des „FamilyNet“, die sich deutlich von derselben eines Hausnotrufs abgrenzt und somit eine Nutzeninnovation schafft (Abb. 3).
Unter Zuhilfenahme des sog. ERSK-Quadrats der Blue Ocean-Methode wurden bestimmte Produktfeatures der Mitbewerber bewusst weggelassen oder diese signifikant verbessert bzw. völlig neuartige Elemente hinzugefügt. Im konkreten Fall soll daher auf die Einbindung einer Hausnotrufzentrale komplett verzichtet werden, da diese direkte bzw. indirekte Kosten verursacht, ohne einen entsprechend hohen Nutzen für den Anwender zu generieren (Stiftung Warentest 2011). Durch die bewusste Negierung dieses bisher als „unverzichtbar“ geltenden Servicemerkmals entsteht einerseits eine deutliche Abgrenzung zu anderen Mitbewerbern und andererseits vor allem eine erhebliche Verbesserung des Kosten-Nutzen-Verhältnisses.

Eine wichtige Möglichkeit zur Differenzierung bietet auch der optische Eindruck, den ein Produkt beim Kunden hinterlässt. Der Universal Design-Ansatz hat hier vor allem die wichtige Aufgabe, eine mögliche Stigmatisierung der Interessenten gar nicht erst aufkommen zu lassen. Bisher am Markt etablierte AAL-Produkte vernachlässigen in ihrer Außendarstellung häufig die Tatsache, dass Senioren nicht als „alt“ bzw. krank gelten möchten und sich auch nicht so wahrnehmen.

Neuartig bei FamilyNet sind das präventive Gesundheitsmonitoring, die Umsetzung der automatischen Sturzerkennung sowie der konsequente Familienbezug. Die ersten beiden Merkmale sind durch die überlegenen technischen Möglichkeiten des neuen Produkts möglich geworden. Das Gesundheitsmonitoring vermeidet den defizitorientierten und ebenfalls stigmatisierenden Fokus auf reine Notfallsituationen. Die Betonung des Familienbezugs mindert die Ängste, der Technik ausgeliefert zu sein oder den Kontakt zu den Angehörigen zu verlieren, welche Senioren oft empfinden. Durch die konsequente Fokussierung auf die nächsten Angehörigen als Erstkontakt wird der Familienbezug gestärkt und die Privatheit des Systems – auch im Sinne des Datenschutzes – unterstrichen.

5 Ausblick

Nach Markteinführung des fertigen Produktes ist ein Feldversuch geplant, der das Benutzerverhalten sowie die Akzeptanz des Hausschuhs insbesondere auf Seiten der Angehörigen im Detail analysieren soll. Aus Sicht der Forschung wird es interessant sein, wie sich die heute noch vorhandene „skeptische Zurückhaltung“ gegenüber AAL-Produkten, vor allem bei den Hauptakteuren des klassischen Gesundheitsmarktes (Ärzten, Pflegefachleuten, Krankenkassen, Medizinprodukteherstellern), in Zukunft entwickeln wird. Hier ist insbesondere die Frage interessant, ob sich tatsächlich ein „blauer Ozean“ jenseits klassischer Vertriebswege, z. B. im Direktvertrieb über das Internet oder in Discountmärkten, eröffnen lässt. Der Neukunde „Angehöriger“ könnte hierzu ebenfalls beitragen. Nicht zuletzt ist auch die weitere Entwicklung im „Haifischbecken“ (roter Ozean) der etablierten Hausnotrufsysteme und ihrer Vertreiber (Hilfsorganisationen, Pflegedienste) zu beobachten.

Literatur

Dunne, R.G.; Bergman, A.B.; Rogers, L.W. et al., 1993: Elderly Persons' Attitudes Towards Footwear – A Factor in Preventing Falls. In: Public Health Reports D 108/2 (1993), S. 245–248

Johnson, R.B.; Onwuegbuzie, A.J., 2004: Mixed Methods Research: A Research Paradigm Whose Time Has Come. In: Educational Researcher 33 (2004), S. 14–26

Kim, W.C.; Mauborgne, R., 2005: Der blaue Ozean als Strategie – Wie man neue Märkte schafft, wo es keine Konkurrenz gibt. München

Kopp, T.; Schöchlin, J., 2014: Der intelligente Hausschuh im blauen Ozean: Eine empirische Untersuchung zur Markteinführung eines innovativen altersgerechten Assistenzsystems. Lohmar

Munro, B.J.; Steele, J.R., 1999: Household-shoe Wearing and Purchasing Habits. A Survey of People Aged 65 Years and Older. In: Journal of the American Podiatric Medical Association 89 (1999), S. 506–514 (zit. nach: Sherrington, C.; Menz, H.B., 2003: An Evaluation of Footwear Worn at the Time of Fall-related Hip Fracture. In: Age und Ageing 32 (2003), S. 310–314)

Oppenheim, A.V.; Schafer, R.W., 2004: Zeitdiskrete Signalverarbeitung. New York

Schneekloth, U.; Leven, I., 2003: Hilfe- und Pflegebedürftige in Privathaushalten in Deutschland 2002. Schnellbericht. München

Stiftung Warentest, 2011: Alarmbereit – Hausnotrufdienste im Vergleich. In: Test 9 (2011), S. 82–87

Story, M.F., 1998: Maximizing Usability: The Principles of Universal Design. In: Assistive Technology 10/1 (1998), S. 4–12

White, E.; Mulley, G., 1989: Footwear Worn by the Over 80's: A Community Survey. In: Clinical Rehabilitation 3/1 (1989), S. 23–25

Kontakt

Dr. Jürgen Schöchlin
Dorfbachweg 6, 79341 Kenzingen
E-Mail: post@dr-schoechlin.de

Tobias Kopp
Fichtenweg 11,72076 Tübingen
E-Mail: kopp@it-praxisberatung.de

« »

REZENSIONEN

Gesellschaft, Natur und Biosozialität

T. Lemke: Die Natur in der Soziologie. Gesellschaftliche Voraussetzungen und Folgen biotechnologischen Wissens. Frankfurt a. M.: Campus 2013, 204 S., ISBN 978-3-593-39862-4, Euro 29,90

Rezension von Ulrich Dolata, Universität Stuttgart

Seit den Enthüllungen Edward Snowdens ist viel von den Schattenseiten neuer Informations- und Kommunikationsmedien im Allgemeinen und des Internets im Besonderen die Rede, deren gewaltige Potenziale zur privatwirtschaftlichen Beobachtung und staatlichen Überwachung von Nutzern und Nutzergruppen mittlerweile auch einer breiteren Öffentlichkeit bekannt sind. Demgegenüber steht der zweite große soziotechnische Umbruch, der unsere Gesellschaften seit den 1980er Jahren nachhaltig verändert, heute weit weniger im Fokus der öffentlichen Aufmerksamkeit: die Etablierung und Folgen bio- und gentechnologischer Methoden und Verfahren, die die gezielte Analyse und Rekombination natürlicher Prozesse ermöglichen und seither das Verhältnis von Gesellschaft und Natur neu definieren.

Von diesen Veränderungen und den damit verbundenen Problemen handelt der schmale Band von Thomas Lemke, Soziologieprofessor an der Universität Frankfurt. Er bringt einen Originalbeitrag und sechs weitere, bereits publizierte Texte zum Thema zusammen, die für die vorliegende Veröffentlichung überarbeitet und aktualisiert worden sind. Die Texte sind teils theoretisch, teils problemorientiert angelegt und beschäftigen sich durchweg kritisch mit konzeptionellen Ansätzen zum Verhältnis von Sozialem und Natur bzw. mit negativen sozialen Folgen, die die Anwendung biotechnologischer Methoden und Verfahren mit sich bringen. Ihnen gemein ist die Annahme, „dass die Genese, Zirkulation und Anwendung biowissenschaftlichen Wissens und biotechnologischer Innovationen zu einer Neukonfiguration gesellschaftlicher Verhältnisse führt“ (S. 15).

Den Ausgangspunkt der einzelnen Beiträge bildet das in der Einleitung zum Ausdruck gebrachte und berechtigte Unbehagen darüber, dass die Natur (ebenso wie die Technik) bzw. das Verhältnis von Natur und Gesellschaft in weiten Teilen der Soziologie noch immer unterthematisiert sind. Werden sie überhaupt Gegenstand der Forschung, dann erfolge das entweder über naturalistische Konzepte, die sich in einer umweltdeterministischen Perspektive auf Anpassungsleistungen der Gesellschaft an ihre äußere Umwelt konzentrierten, oder im Rahmen soziozentrischer Ansätze, in denen Prozesse der sozialen Konstruktion der natürlichen Umwelt durch gesellschaftliche Wahrnehmungsformen im Mittelpunkt des Interesses stünden. Demgegenüber plädiert Lemke für einen „‚dritten Weg‘ jenseits von Naturalismus und Soziozentrismus“ (S. 14), der allerdings weder in der Einleitung noch in einem der anschließenden Aufsätze systematisch entwickelt und ausargumentiert wird.

1 Biopolitik, Biosozialität und politische Ökologie

Im Zentrum der eher theoretisch angelegten Aufsätze steht stattdessen die Darstellung und Auseinandersetzung mit verschiedenen konzeptionellen Ansätzen, die das durch biotechnologisches Wissen und Innovationen veränderte Verhältnis von Gesellschaft und Natur in der einen oder anderen Weise thematisieren: etwa mit der Actor-Network-Theory und dem Entwurf einer politischen Ökologie von Bruno Latour, mit Konzepten der Biopolitik und Biosozialität oder mit dem Begriff der biologischen Bürgerschaft. Darüber hinaus finden sich in dem Band auch Aufsätze, die konkreter auf problematische Folgen biotechnologischen Wissens und praktizierter Verfahren eingehen – so etwa zur genetischen Diskriminierung oder zu DNA-Abstimmungsgutachten in Einwanderungsverfahren.

Wenn von der Aufhebung von Dualismen und der Erfassung von symmetrischen Verhältnissen zwischen Sozialem, Technik und Natur die Rede ist, dann ist die Actor-Network-Theory (ANT) von Bruno Latour in der Regel nicht fern. Ein

Aufsatz befasst sich denn auch mit dessen Vorstellungen von einem Parlament der Dinge und kann als gute, konzise und kritische Einführung in die ANT und deren Inkonsistenzen gelesen werden. Lemke kritisiert überzeugend deren begriffliche Unschärfen, die letztlich mangelnde Symmetrie zwischen menschlichen und nicht-menschlichen Akteuren, deren signifikante Unterschiede dort nicht berücksichtigt würden und zu einer Nivellierung distinkter Handlungstypen führten sowie deren verkürzte Fassung des Politischen, in der Konflikte, Auseinandersetzungen und Machtfragen weitgehend ausgeblendet blieben.

Ähnlich verfährt Lemke in seiner Auseinandersetzung mit dem Begriff der Biosozialität, der Anfang der 1990er Jahre von Paul Rabinow in die Diskussion gebracht worden ist. Mit ihm sollte zum einen zum Ausdruck gebracht werden, dass sich insbesondere mit dem Human Genome Project ein epochaler Bruch ankündige, dessen Signatur eine immer stärkere Durchmischung von Lebensprozessen und Gesellschaft sei. Und zum anderen führe biologisches Wissen zu neuen Formen sozialer Identitäten, die sich aus dem zunehmenden Wissen über genetische Merkmale ergäben. Am Beispiel von Selbsthilfegruppen und Patientenvereinigungen kritisiert Lemke, dass Prozesse der Identitätsbildung dort nicht nur von Vorstellungen einer eindeutigen und fixen Biologie bestimmt würden, sondern zudem maßgeblich durch von Experten oder Medien transportierte Deutungsangebote geprägt seien, die dann von Individuen und Gruppen aufgegriffen würden.

2 Biologische Bürgerschaft, genetische Diskriminierung und DNA-Abstammungsgutachten

Darüber hinaus setzt sich Lemke, ebenfalls am Beispiel von Patientenvereinigungen und Selbsthilfegruppen, kritisch mit Konzepten der biologischen Bürgerschaft auseinander, „die Ansprüche auf Teilhabe an sozialen und politischen Prozessen und die Anerkennung individueller oder kollektiver Identitäten bezeichnen, deren konstitutive Grundlage in spezifischen biologischen und genetischen Merkmalen gesehen wird“ und die mit der „Einforderung von Rechten aufgrund biologischer Besonderheiten“ einhergehen (S. 41). Lemke weist auch hier überzeugend auf die damit verbundenen Gefahren hin: etwa auf neue Möglichkeiten der Stigmatisierung und Exklusion, neue medizinische Klassifikationssysteme, die Verwehrung von Versicherungsoptionen oder Lebenschancen auf der Grundlage genetischer Anomalien, der Re-Medikalisierung und Biologisierung menschlichen Verhaltens oder auf Tendenzen zur Individualisierung von Gesundheitsverhalten oder Reproduktionsentscheidungen.

Diese Kritik an den negativen Folgen biotechnologischen Wissens und biotechnologischer Verfahren wird in zwei weiteren problemorientierten Aufsätzen fortgeführt. Zum einen beschäftigt sich Lemke mit der Frage genetischer Diskriminierung, also der Ungleichbehandlung von Menschen aufgrund spezifischer genetischer Eigenschaften, und unterscheidet plausibel drei Dimensionen voneinander: erstens organisationale Diskriminierung, die etwa von Versicherungen, Arbeitgebern oder Behörden ausgeübt wird. Zweitens interaktionelle Diskriminierung, die die Betroffenen im Alltag als Ausschluss, Missachtung und Benachteiligung erfahren. Und drittens institutionelle Diskriminierung, die sich über hegemoniale gesellschaftliche Normen und Werte konstituiert und sich beispielsweise in Lebenswertzuschreibungen oder gesellschaftlichen Erwartungen an die Lebensführung der Individuen niederschlägt.

Zum anderen untersucht Lemke die Auswirkungen von DNA-Abstammungsgutachten in Einwanderungsverfahren und geht der Frage nach, wie sich ein derart auf die biologische Abstammung fokussiertes Prüfverfahren auf das Verständnis von Familie und Verwandtschaft auswirkt. Er zeigt, dass Immigranten, die einen Antrag auf Familiennachzug stellen, bei aller formellen Freiwilligkeit faktisch gezwungen werden, sich auf ein DNA-Abstammungsgutachten einzulassen und wie dadurch ihr Recht auf informationelle Selbstbestimmung zugunsten einer Fremdkontrolle ihrer genetischen Daten ausgehebelt wird. Darüber hinaus kritisiert er, dass damit der Familienbegriff in der Einwanderungspraxis wieder auf biologische Merkmale und auf längst überwunden geglaubte Vorstellungen von einer Abstammungsgemeinschaft reduziert wird.

Alle theoretischen bzw. problemorientierten Texte, die der Band versammelt, sind jeder für

sich interessant und gut lesbar – auch, weil Lemke es versteht, sowohl die aufgegriffenen Konzepte etwa der Biopolitik, Biosozialität und politischen Ökologie als auch konkrete Probleme wie das der genetischen Diskriminierung nicht nur luzid darzustellen, sondern zugleich einer systematischen und gut nachvollziehbaren Kritik zu unterziehen. Was freilich fehlt ist ein bilanzierender und weiterführender Schlussaufsatz, der auf der Grundlage der in den Aufsätzen ausgelegten Fährten die eingangs angemahnte Entwicklung eines dritten Weges der Integration von Gesellschaft und Natur jenseits naturalistischer und sozio-zentrischer Herangehensweisen genauer theoretisch-konzeptionell ausgearbeitet hätte. So bleibt es bei durchaus interessanten Puzzleteilen aus Konzepten, Problemen und Kritik, die auch am Schluss nicht zu einem Gesamtbild zusammengefügt werden.

« »

Der Verlust von Datensicherheit und Innovativität

Positionen etablierter Wissenschaftler im „Neuland“

***D. Klumpp, K. Lenk, G. Koch (Hg.)*: Überwiegend Neuland. Positionsbestimmungen der Wissenschaft zur Gestaltung der Informationsgesellschaft. Berlin: edition sigma 2014, 208 S., ISBN 978-3-8360-3599-6, Euro 17,90[1]**

von Arnd Weber, ITAS

Der Band hat einen ambitionierten Titel. Erstens bezieht er sich auf die deutsche Kanzlerin, die im Zusammenhang mit den Enthüllungen über die NSA-Abhöraktionen von „Neuland“ sprach (Spiegel Online 2013). Da die Autoren sich teilweise seit Jahrzehnten mit der Nutzung des Internets beschäftigen, bezieht sich die Erwähnung des Begriffs im Titel auf die verbreitete Kritik an dieser Charakterisierung. Gleichzeitig wollen die Autoren jedoch ausdrücken, dass noch viele Fragen der „Gestaltung der Informationsgesellschaft“ offen seien. Darauf lässt auch der Untertitel schließen: Der Band enthalte hierzu die „Positionsbestimmungen der Wissenschaft“, nicht mehr und nicht weniger. Der Verlag stellt auf der Rückseite des Buches klar, in diesem Buch gehe es darum, „Risiken ab(zu)wehren, wie sie … durch die NSA-Enthüllungen … deutlich wurden“. Insofern wird die Messlatte für die Bewertung der Gestaltungsvorschläge sehr hoch gelegt.

1 Schutz vor Unterminierung und Spionage?

Die Versprechungen, die der Titel und die Buchrückseite enthalten, beziehen sich auf Themen, die auch in der IT-bezogenen Politikberatung des Instituts für Technikfolgenabschätzung und Systemanalyse (ITAS) zentral sind. Was kann man z. B. gegen den „full take“ des Internets machen, den die NSA speichert? Was gegen die Unterminierung von Computern und Verschlüsselungssoftware („insert vulnerabilities into commercial … IT systems and communications devices“, so hieß es auf den Slides von Snowden)? Was kann man dagegen tun, dass die NSA verschlüsselte Informationen zur späteren Analyse aufhebt, also anscheinend in der Lage ist, sich Zugang zu den Schlüsseln oder zum Klartext zu verschaffen?

Dieter Klumpp ist Leiter der Alcatel-Stiftung. Er schreibt bezugnehmend auf diese Fragen in seinem Artikel, dass ein innovationsorientierter Datenschutz gut wäre (S. 200). Das ist einerseits eine Anforderung, die dem Vorwurf des Datenschutzes als Hindernis entgegenwirkt. Es bleibt aber unklar, wie ein besserer rechtlicher Datenschutz, selbst eine teilweise Vermeidung der Entstehung personenbezogener Daten, gegen die Unterminierung tendenziell aller Rechner und gegen den „full take“ helfen soll.[2] Und was meint der Ko-Herausgeber Klaus Lenk dazu? Lenk ist u. a. Vorstand des (deutschen) „Nationalen eGovernment Kompetenzzentrums“. Er schreibt in seinem Beitrag, dass wesentliche Teile der Informationstechnik der politischen Gestaltung durch Europäer entzogen seien (S. 204). Dem kann aus zwei Gründen nicht zugestimmt werden. Der eine ist, dass derzeit durchaus diskutiert wird, durch Regulierung ein höheres Niveau der Sicherheit der Endgeräte zu erzielen, so durch Gernot Heiser (2013), Sandro Gaycken (2014) oder auch durch den Autor dieser Rezension schon vor Bekanntwerden der Snowden-Enthüllungen (Weber/We-

ber 2010). Wenn die Endgeräte nicht unterminiert wären, ließen sich praktisch eine nicht brechbare Verschlüsselung und sogar anonyme Nutzungen erreichen. Unklar bleibt auch, wieso die Europäer nicht genauso wie das US-Verteidigungsministerium an eigenen, hochsicheren Computersystemen arbeiten können. So hat beispielsweise die US-amerikanische Behörde *Defense Advanced Research Projects Agency* (DARPA) ihr HACMS-Programm (High-Assurance Cyber Military Systems; ZDnet 2013), das u. a. an unangreifbaren Drohnen arbeitet. Ähnlich arbeitet die Universität Cambridge (UK) in ihrem „clean slate"-Programm am Neudesign von Computern (University of Cambridge 2014). Gäbe es in Deutschland und Europa keine Wege, solche Systeme für militärische oder zivile Einsätze zur Produktreife zu entwickeln und ihren Einsatz z. B. in kritischen Infrastrukturen vorzuschreiben?

Auch unterhalb der Ebene hochsicherer Hard- und Software haben die Europäer Gestaltungsmöglichkeiten, die die Autoren nicht erwähnen. Michael Waidner argumentiert, dass der Staat den Einsatz von Verschlüsselung fördern könne (Waidner 2014), was die Arbeit der NSA erschweren würde, da sie nicht alles entschlüsseln kann. Caspar Bowden (2013) argumentiert, dass in Europa eine Gesetzgebung helfen würde, wonach Daten europäischer Bürger nur bei europäischen Betreibern, die mit europäischem Personal und nach europäischem Recht arbeiten, verarbeitet werden dürfen. Dies würde den „full take" erschweren.

Zum anderen kann Lenks These des Mangels an Gestaltbarkeit auch deshalb nicht zugestimmt werden, da er den Verlust der europäischen Bestimmung der Informationstechnik unzureichend thematisiert. Bis etwa 2007 waren europäische Unternehmen im Mobilfunkbereich sogar dominant. Europäischen Investoren, Hersteller und Netzbetreiber hatten überwiegend auf eigene Techniken gesetzt, wie SMS und WAP (Weber et al. 2011). Diese waren gegenüber den Internettechniken schlechter, z. B. war praktisch keine Übermittlung von Links in Nachrichten möglich. In kartellartiger Form wurden letztere jedoch teuer vermarktet (1 MB per SMS hätte 1000 Euro gekostet; WAP wurde als „wait and pay" kritisiert; vgl. Weber et al. 2011). Ewan Sutherland warf den Mobilfunkbetreibern vor, Daten wie Wasser in der Wüste zu verkaufen (2005). Da die Kunden die europäischen Mobilfunkmarken zu Recht mit hohen Preisen und schlechter Qualität assoziierten, verkauften sich diese Dienste, von SMS abgesehen, kaum. Wie René Obermann, damals Chef von T-Mobile, sagte: „Die Qualität der Dienste ist nicht hoch genug" (2004 auf dem Petersberg). Dies wurde erst anders, als *Apple* das mobile Internet mit einer Flatrate und einwandfrei funktionierenden Geräten anbot.

Dass man in Europa die Trends zum Internet und zu Smartphones verschlafen habe (S. 182, 191), kann damit nicht unwidersprochen bleiben. Die europäischen Hersteller und Betreiber wussten von den Vorteilen der Internettechniken, wollten jedoch lieber ihre eigenen teuer verkaufen und boten Internettechniken ausschließlich zu noch höheren Kosten an. Dass man in der deutschen Wirtschaft generell nicht „big" denken könne (S. 191), kann angesichts der Erfolge der deutschen metallverarbeitenden Industrie auf dem Weltmarkt auch nicht behauptet werden. Auch Nokia dachte „big" mit dem Versuch, den Erfolg von SMS mit MMS, WAP etc. fortzuführen. Datendienste künstlich verteuert anzubieten, führte jedoch zu keinem dauerhaften Markterfolg. Bouwman (2014) nannte Nokia „arrogant" und „inkompetent" in Bezug auf die Anwendungen für *Symbian* und *Ovi*. Anbieter, die ihre Dienste auf der Basis des effizienten Internetprotokolls anboten, wischten schließlich die europäischen Handyhersteller beiseite.

In Bezug auf die NSA und die Bestimmung der Informationstechnik wäre es also wünschenswert gewesen, die internationalen Fachdiskussionen stärker aufzunehmen.

2 Schwerpunkt eGovernment

Die weiteren Beiträge des Buches behandeln im Wesentlichen die Gestaltbarkeit der IT-Nutzung, v. a. im Bereich eGovernment (in Bezug auf in Deutschland, mit einem Seitenblick auf Österreich).[3] Was sind hier die zentralen Aussagen? Zunächst wird ein Rückblick auf die Nutzung der Informationstechnik in der öffentlichen Verwaltung gegeben, und zwar in den Artikeln von Klaus Lenk und von Arthur Winter, letzterer ein

leitender Mitarbeiter des österreichischen Finanzministeriums. Einerseits wird festgestellt, dass der IT-Ansatz im öffentlichen Dienst letztlich dem Gemeinwohl dienen soll, so Lenk. Andererseits springt die Frage nach der Effizienz von eGovernment-Maßnahmen in Auge. Der Bürger tritt ja nur sehr selten in Kontakt mit Behörden. Gerhard Schwabe benennt in seinem Artikel das Beispiel wie „ich meinen Umzug abwickle" (S. 69). An anderer Stelle schrieb Klumpp, dass es „durchschnittlich drei Behörden-Interaktionen pro Jahr" gäbe (Klumpp 2013). Das zeigt, dass es schwierig ist, die Einführung von Chipkarten, elektronischen Ausweisen und ähnlichem zu rechtfertigen. Die Formulierung von Winter, wonach es „bis zu durchschnittlich 130 Verwaltungskontakte pro Jahr für ein Unternehmen" gäbe, wirft unmittelbar die Frage auf, wie viele Kontakte es denn nun im Schnitt sind. Die Effizienz von eGovernment wird aber nicht behandelt, obwohl sie durchaus auf dem Radarschirm internationaler Forschung ist (Misuraca et al. 2012).

Die Beiträge von Bernd Holznagel, Wolfram Felber und Jörn von Lucke geben einen Überblick über „open government" und „open data", d. h. die Zurverfügungstellung von Regierungsdaten an Bürger und Unternehmen. Hier steht offenbar noch der Klärungsprozess darüber aus, welche Daten angeboten werden sollen und welche Nutzung erlaubt werden soll. Günter Cyranek weist in seinem Artikel darauf hin, dass es in Südamerika Bestrebungen gibt, Bildungsmaterialien als „open content" zur Verfügung zu stellen. Zu den öffentlichen Daten gehören auch die Medienangebote der öffentlich-rechtlichen Anbieter, die bisher nur beschränkt Daten ins Internet stellen dürfen. Nach Volker Grassmuck sollte dies von den Bürgern in einem Gesellschaftsvertrag kontrolliert werden.

Helmut Krcmar und Petra Wolf sprechen sich in ihrem Beitrag für eine Zertifizierung der Anwender von Cloud-Diensten aus. Diese würde z. B. öffentlichen Auftraggebern ermöglichen, zu sehen, dass gewisse Sicherheitsvorgaben bestätigt wurden. Was dies nach Snowden bedeutet, was dies für US-Anbieter bedeutet, die US-Geheimgesetzen unterliegen, was dies bei der Existenz von Hintertüren bedeutet, ob verschlüsselte Daten durch US-Stellen im Klartext abgezogen werden können etc. wird von den Autoren leider nicht diskutiert, wurde aber durchaus in internationaler Forschung untersucht (Bowden 2013).

3 Probleme beim Netzausbau?

Einige Beiträge thematisieren die Entwicklung elektronischer Netze als Infrastrukturen. Im Artikel von Nico Grove werden Infrastrukturentscheidungen als schwer reversibel gekennzeichnet (S. 127), weshalb der Staat Investitionsstrategien festlegen müsse (S. 131). Groves Prämisse bleibt jedoch unbelegt. Funknetze können relativ leicht auf- und abgebaut werden (vgl. Shinohara et al. 2014). In Ländern mit oberirdischer Kabelverlegung können auch Festnetze relativ leicht ergänzt werden. Wie der Staat am besten wissen solle, welche IT-Infrastrukturen zukünftig nachgefragt werden, bleibt unklar. Thomas Hart weist in seinem Artikel darauf hin, dass es v. a. um den Konsum von Videos gehe. Ob der Staat hier so große Kapazitäten schaffen müsse, dass sie für ein Streaming reichen, bleibt dem Rezensenten unklar. Gleichwohl haben einige Länder große Glasfasernetze gelegt, wie Schweden oder Japan (Sandgren/Mölleryd 2013), worauf die Autoren aber nicht eingehen.

Im Artikel von Klumpp wird der weitere Ausbau der Netze mit Glasfaser thematisiert. Es fehlen jedoch klare Aussagen, ob dieser nötig ist. Andererseits findet sich die Aussage, dass die physikalischen Gesetze gelten würden (S. 187f.) – damit muss gemeint sein, dass die Erhöhung der Kapazitäten der Kupferkabel und der drahtlosen Netze zur Versorgung nicht ausreicht. Auch wird darauf hingewiesen, dass der Ausbau nicht mehr koste als die UTMS-Versteigerungserlöse erbracht hätten (S. 196). Diese Stellen lassen sich so interpretieren, dass ein Glasfaserausbau von Klumpp befürwortet wird. Ähnlich äußert sich Hart, dass der Netzausbau stocke (S. 134). Klumpp fordert in diesem Zusammenhang eine Abkehr vom wettbewerbsorientierten Partikularismus (S. 200). In Klumpp (2014) führt er aus, dass mehr Kollaboration und Kooperation nötig seien, weniger Wettbewerb. Man muss nun vermuten, dass es den Autoren darum geht, der *Deutschen Telekom* zu erlauben, zukünftige Glasfaserkabel nur relativ teuer an Wettbewerber zu vermieten (Sietmann 2010). Es wird der Eindruck erweckt,

für eine Informationsgesellschaft seien solche Investitionen notwendig. Es wird auch darauf hingewiesen, dass Europa immer noch führend bei Netzinfrastrukturen sei: „Europe is still the world leader“, wird Neelie Kroes zitiert (2014). Welche Bedeutung das hat, wo inzwischen ausländische Hersteller wie *Apple* und *Samsung* viel wertvoller sind als *Alcatel-Lucent* oder *Ericsson* und überhaupt der meiste drahtlose Verkehr über WiFi abgewickelt wird, bleibt undiskutiert. Die Autoren argumentieren aus einer Perspektive des Netzes. Wenn die Gesellschaft eine Informationsgesellschaft ist oder wird (kein Kapitalismus, keine Marktwirtschaft), dann müssen Investitionen ins Netz gut sein. Insgesamt wird im hier rezensierten Buch viel vom Netz und dem Internet als solchem und weniger von den Endgeräten und Diensten gesprochen. Dass man das Internet einfach auch als Kanal verstehen kann und es darauf ankommt, seine Enden zu sichern und attraktive Inhalte zu übermitteln, wird dabei übersehen, genauso wie die Möglichkeit, Kommunikation und eCommerce nach Belieben zu verschlüsseln und zu anonymisieren (Chaum 1981).

Insgesamt zeigt sich, dass die Autoren einen Überblick über die deutsche, politische, nichttechnische Diskussion von elektronischen Netzen, Geräten und Anwendungen geben. Wirklich „big“ wäre diese Rundumschau, wenn weltweit auf politische Debatten und technische Lösungsansätze geschaut würde. Dazu wäre in Deutschland ein kritischer Think-tank nötig, den es, unsere TA-Studien zu einzelnen IT-Themen belegen es (z. B. Rader/Weber 2002; Bohlin et al. 2004; Weber/Weber 2010; Jacobi et al. 2013), in ganz Europa nicht gibt.

Anmerkungen

1) Mit Beiträgen von Klaus Lenk, Arthur Winter, Jörn von Lucke, Bernd Holznagel, Wolfram Felber, Gerhard Schwabe, Volker Grassmuck, Wolfgang Coy, Thomas R. Köhler, Nico Grove, Thomas Hart, Günther Cyranek, Monika Ermert, Helmut Krcmar, Petra Wolf, Dieter Klumpp.
2) Der Beitrag von Klumpp entspricht in weiten Teilen seinem Diskussionsbeitrag auf einer Tagung in Österreich im Februar 2014, die er auf S. 181 erwähnt: http://www.domainpulse.at/de/programm (download 26.1.15).
3) Im vorliegenden Band werden auch noch andere Themen angesprochen, etwa autonome Fahrzeuge. Für eine vollständige Inhaltsübersicht siehe http://www.edition-sigma.de/InhaltPDF/Inhalt3599.pdf (download 26.1.15).

Literatur

Bohlin, E.; Lindmark, S.; Björkdahl, J. et al., 2004: The Future of Mobile Communications in the EU: Assessing the Potential of 4G. IPTS Technical Report prepared for the European Commission – Joint Research Centre. Seville; http://ftp.jrc.es/EURdoc/eur21192en.pdf (download 27.1.15)

Bowden, C., 2013: The US National Security Agency (NSA) Surveillance Programmes (PRISM) and Foreign Intelligence Surveillance Act (FISA) Activities and Their Impact on EU Citizens’ Fundamental Rights. Briefing Note. Brussels

Bouwman, H., 2014: Why Nokia Failed to Nail the Smartphone Market. Presentation given at ITS Brussels

Chaum, D., 1981: Untraceable Electronic Mail, Return Addresses, and Digital Pseudonyms. In: Communications of the ACM 24/2 (1981), S. 84–88

Gaycken, S., 2014: Resetting the System. New York; http://www.ewi.info/sites/default/files/Resetting%20the%20System.pdf (download 20.1.15)

Heiser, G., 2013: White Paper Protecting e-Government Against Attacks; http://www.itas.kit.edu/downloads/projekt/projekt_webe12_cosiso_heiser_paper.pdf (download 20.1.15)

Jacobi, A; Jensen, M.; Kool, L. et al., 2013: Security of eGovernment Systems. Conference Report; http://www.europarl.europa.eu/stoa/webdav/site/cms/shared/0_home/STOA%20Sec%20of%20eGovernment%20-%20Conference%20Report.pdf (download 20.1.15)

Klumpp, D., 2013: Neuartige offene IT-gestützte Formen der Zusammenarbeit beim Regierungs- und Verwaltungshandeln. 5. TICC Round Table Wissenschaft trifft Politik, Stuttgart, 24.1.13; http://www.instkomm.de/4-0-Publikationen.html (download 20.1.15)

Klumpp, D., 2014: Zum Strukturwandel der Wertschöpfung in der informatisierten Wirtschaft; http://www.instkomm.de/files/erp_dru_07.pdf (download 20.1.15)

Kroes, N., 2014: 5G for the Connected Continent. GSMA Mobile World Summit. Barcelona, February 24, 2014; http://europa.eu/rapid/press-release_SPEECH-14-155_en.htm (download 20.1.15)

Misuraca, G.; Savoldelli, A.; Codagnone, C., 2012: Explaining the eGovernment Paradox: An Analysis of Two Decades of Evidence from Scientific Literature

and Practice on Barriers to eGovernment. Presentation given at ICEGOV 2012. Albany

Rader, M.; Weber, A., 2002: Mobile Phones as Carriers of Cash and Tickets? The Outlook in Europe. In: IPTS Report May 2002, S. 43–49

Sandgren, P.; Mölleryd, B., 2013: How Liberalized is the Optical Fiber Broadband Market? Examining the Role of Public Money in the Fiber Deployment in Sweden. Paper presented at ITS Florence

Shinohara, S.; Morikawa, H.; Tsuji, M., 2014: Empirical Analysis of Mobile Broadband Adoption in Major Six Countries From The View of Competition Policy. Paper presented at ITS Rio de Janeiro

Sietmann, R., 2010: Next Generation Access. Das Endspiel: Warum Fiber-to-the-Home nicht vorankommt; c't 4 (2010). http://www.heise.de/ct/artikel/Next-Generation-Access-970831.html (download 20.1.15)

Spiegel Online, 2013: Die Kanzlerin entdeckt #Neuland. 19.6.13; http://www.spiegel.de/netzwelt/netzpolitik/kanzlerin-merkel-nennt-bei-obama-besuch-das-internet-neuland-a-906673.html (download 20.1.15)

Sutherland, E., 2005: Regulation of Cellular Markets; http://www.3wan.net/talks/2005/ES_2005_11_edinburgh.pdf (download 20.1.15)

University of Cambridge Computer Laboratory, 2014: CTSRD – Rethinking the Hardware-software Interface for Security; https://www.cl.cam.ac.uk/research/security/ctsrd/ (download 20.1.15)

Waidner, M., 2014: Stellungnahme zur Anhörung des NSA-Untersuchungssauschusses am 26. Juni 2014; http://www.bundestag.de/blob/285122/2f815a7598a9a7e9b4162d70173ecedb/mat_a_sv-1-2-pdf-data.pdf (download 20.1.15)

Weber, A.; Weber, D., 2010: Options for Securing PCs Against Phishing and Espionage. A Report from the EU-project „Open Trusted Computing". In: Gutwirth, S.; Poullet, Y.; De Hert, P. et al. (Hg.): Computers, Privacy and Data Protection: An Element of Choice. Proceedings of CPDP 2010 Brussels. Berlin, S. 201–207; http://www.springerlink.com/content/t067038412352321/ (download 20.1.15)

Weber, A.; Haas, M.; Scuka, D., 2011: Mobile Service Innovation: A European Failure. In: Telecommunications Policy 35/5 (2011), S. 469–480

ZDnet, 2013: Research for Unhackable UAVs Could Be Used for BYOD: NICTA. May 28, 2013; http://www.zdnet.com/au/research-for-unhackable-uavs-could-be-used-for-byod-nicta-7000015937/ (download 20.1.15)

« »

Autorenhinweise

Wir bitten alle Autorinnen und Autoren, die ein Manuskript bei TATuP einreichen, die folgenden Hinweise zu beachten:

Umfang: Eine Druckseite umfasst max. 3.500 Zeichen (ohne Leerzeichen). Für den Umfang eines Beitrags ist die Rubrik, in der er erscheint, ausschlaggebend. Genauere Angaben erhalten die Autoren von der Redaktion.

Abstract: Autoren, deren Beiträge im Themenschwerpunkt des Heftes oder in den Rubriken TA-Konzepte und -Methoden und Diskussionsforum sowie TA-Projekte erscheinen, werden gebeten, ihrem Beitrag ein Abstract voranzustellen, in dem eine kurze inhaltliche Übersicht über den Beitrag gegeben wird. Die Länge dieses Abstracts sollte 780 Zeichen (ohne Leerzeichen) nicht überschreiten.

Abbildungen, Diagramme und Tabellen: Abbildungen und Tabellen sind sowohl in das eingereichte Manuskript einzufügen sowie auch getrennt von der ersten Fassung des Manuskripts einzusenden. Abbildungen und Tabellen bitte mit Überschrift und Quellenangabe versehen. Wurden sie vom Autor selbst erstellt, bitte die Formulierung „eigene Darstellung" als Quellenangabe verwenden *Zum Format*: Tabellen sind als *Word*-Datei, Diagramme in *Excel* und Abbildungen in *Adobe Illustrator* oder *Powerpoint* zu liefern. Sollten Sie lediglich andere Formate zur Verfügung haben, wenden Sie sich bitte frühzeitig an die Redaktion. Aus Gründen der Seitenplanung und des Layouts liegt die Entscheidung über die endgültige Größe und Platzierung der Abbildungen und Tabellen innerhalb des Beitrags bei der Redaktion.

Bibliografische Angaben: Die zitierte Literatur wird am Ende des Beitrags als Liste in alphabetischer Reihenfolge angegeben. Im Text selbst geschieht dies in runden Klammern (z. B. Wiegerling 2011); bei Zitaten ist die Seitenangabe hinzuzufügen (z. B. Fink/Weyer 2011, S. 91). Bei den Angaben in der Literaturliste orientieren Sie sich bitte an folgenden Beispielen:

Monografien: *Wiegerling, K.*, 2011: Philosophie intelligenter Welten. München

Bei Aufsätzen: Fink, R.D.; Weyer, J., 2011: Autonome Technik als Herausforderung der soziologischen Handlungstheorie. In: Zeitschrift für Soziologie 40/2 (2011), S. 91–111

Bei Beiträgen in Sammelbänden: *Mehler, A.*, 2010: Artifizielle Interaktivität. Eine semiotische Betrachtung. In: Sutter, T.; Mehler, A. (Hg.): Medienwandel als Wandel von Interaktionsformen. Heidelberg

Bei Internet-Quellen: Waterfield, J., 2006: From Corporation to Transnational Pluralism. London; http://www.plugin-tot.com (download 12.3.09)

TAGUNGSBERICHTE

Mobilities: Past, Present, and Future

Report from the Conference "Spinoffs of Mobility: Technology, Risk & Innovation"

Philadelphia, PA, USA, September 18–21, 2014

by Kathleen Oswald, Villanova University, PA, Silke Zimmer-Merkle, and Markus Edelmann, both ITAS

Transportation history and mobility studies often examine the same objects. The ubiquity of traffic, mobility and transport in our environment makes it an indispensable topic for academic history. Mobility studies in turn often take a retrospective approach, drawing conclusions from the past to understand present and future mobilities. This interdisciplinary approach to mobilities research is the field the International Association for the History of Transport, Traffic and Mobility (T2M) is committed to. It held its 12th Annual Conference this year at Drexel University in Philadelphia. Drexel's Center for Mobilities Research and Policy is a leading institution in mobility studies in the US with an international reach. This year's conference theme was "Spinoffs of Mobility: Technology, Risk & Innovation" and drew scholars from a variety of disciplines and continents to address historical, contemporary, and emerging T2M issues on air, land, sea, and outer space.

While not exhaustive, this report covers some of the most relevant topics treated at the conference: speed, risk & safety, accidents & catastrophes, forgotten alternatives, transport planning, infrastructure and smart mobility. Furthermore, we are presenting inter alia some looming TA-relevant issues, embedding them into their historical context: alternatives, reliability, and intended or unintended effects on complex socio-technical systems. The presentations reviewed here encompass different eras, places and modes, but always the same main topic: transport and mobility.

1 Speed

The historical relativism of high speed on passenger railways from 1830 to the present was discussed by Jim Cohen. He asked when and in what context high speed trains were developed. Closely associated with this is the question what actually should be called "high speed"? He showed that high speed, time and spatial distance are socially and historically relative constructs, dividing the development of high-speed trains into four periods: The very first trains (that were x-times faster than what had been known up to that time) brought a new sense of speed in the 1830s and 40s; a second acceleration phase began with the advent of steam trains around 1900–1910; followed by the introduction of streamliners in the 1930s and 40s; and finally the (electric) Japanese Bullet train in the 1960s and 70s representing the final peak of high-speed trains. He concluded by arguing that the denotation "high speed" ensured for some time that these trains could operate profitably. Another panel drew on that very high speed paradigm and showed what "imaginaries" are connected with it and to what extent imagination and vision might influence technological developments.

Peter Lyth took up the high-speed paradigm in his presentation by examining another artefact: His paper "Afterburner glory: Concorde and rise and fall of supersonic travel" focused on the shift in the "mobility paradigm" by Hannam et al. (2006) away from high speed transportation to digital mobility via wide diffusion of high-speed internet and the like.

2 Risk & Safety

Risk – frequently discussed at the conference – took on a variety of meanings in various presentations. A panel comprised of researchers from the Smithsonian National Air and Space Museum looked specifically at risk in the air in the US. Two panels took 9/11 as their focus. Dominick Pisano's paper stressed the importance of access to primary documents that would help researchers provide a factual rather than an experiential (public memory) account of events. F. Robert van der Linden gave a historical look at air crime, beginning with the early use of explosives and hijack-

ings to raise political awareness. He highlighted that while measures such as X-ray scanning and the Hague Hijacking Convention in the 1970s cut down on hijackings, it caused a return to in-flight bombing. A third presentation looked at early smuggling by air, arguing that while organized crime used planes to smuggle alcohol during Prohibition, smuggling was actually evident soon after the plane itself and was used to avoid tariffs.

Valerie Neal of the Smithsonian National Air and Space Museum presented a paper titled "Space Travel: A Rhetoric of Routine, Research, Risk and Renewal" that focused on NASA's use of visual and verbal rhetoric in the 1970s and 80s. Her analysis revealed the extent to which NASA leveraged themes of utilization and routine, which held until the 1986 Challenger accident after which rhetoric shifted to one of "risk" and the shuttle was reframed as a space lab. With developments in space craft increasingly coming from private industry, Neal explains, NASA is today presenting itself as an engine of innovation with their newest campaigns, such as Next Giant Leap.

An entire panel was dedicated to the topic of Automobilism & Risk Society. Fabrice Hamelin gave insight into research policies in his presentation on "Science and Road Safety Policies: a comparison between France and England". From another point of view, Fabian Kröger approached the risks of transport, especially automobilism, in his paper on "Car accidents and crashes in French and US-film history." The panel was completed by Pierre Lannoy's presentation on "Securing transport/animal encounters, or how to distribute responsibilities for disturbed traffics", who again threw the focus on risk from a very different angle. Adjacent to that, Silke Zimmer discussed the evolution of driver assistance systems over the last fifty years.

3 Accidents, Catastrophes and the Uncanny

Beginning with natural catastrophes and their influence on transportation, Mark Barnes' paper "Public Transit System Legacies and Uncertain Mobilities" discussed the lasting impact of historical infrastructural and institutional structures in the way transportation authorities in the region handle extreme weather events and adapt to climate change. A very similar topic was brought up by Rae Zimmerman in her keynote on "Adapting Transportation to Global Risk Challenges" that widely focused on the consequences of climate change and the resulting "extreme weather events" that are becoming increasingly important to transportation planners in the US. By contrast, the resilience of transportation systems has been on the agenda of European transportation planners for a long time. The effects of natural catastrophes were highlighted by Alejandro Crispiani and Tomás Errázuriz, who illuminated in their paper "Deconstructing mobility: uncovering the paradigm after the crisis" what happens after a severe earthquake, when houses are destroyed, transport infrastructure is demolished, and people assemble in the streets, having lost their homes, trying to cope with the situation.

Norman Kellerman focused on the railway accident at Santiago de Compostela. For his analysis, he has taken into account the theoretical concepts of both the high reliability and the inevitable accidents theories. He concluded that a multitude of unfortunate factors are responsible for the disaster, in contrast to earlier single causality estimation. He argued that a central lesson could be to achieve further improvements in the system in order to enhance its redundancy performance. Nevertheless, every ingenious technical answer has its limits and is not able to guarantee an entirely safe transport system. Norman Kellerman reminded us that there can be no technology without any uncertainties, despite all technological desires and expectations.

4 Mobilities and Forgotten Alternatives

Massimo Moraglio's "Elapsed Mobilities: Technology salvation, debris and Benjamin's Angelus Novus" critically scrutinized the mobility concepts of the 21st century. He connected the thesis of David Edgerton – that "calling for innovation is, paradoxically, a common way of avoiding change when change is not wanted" (Edgerton 2006, p. 210) – with the *Angelus Novus* concept by Walter Benjamin. He compared the way today's obsessive technological fix approach is working with how the Angelus Novus is acting. In other words, new and improved high-tech-

nology solutions (as electric cars or driverless vehicles) are seen as the answer to the mobility failures of the past. Moraglio argued to not forget in the debate apparently "old" or "peripheral" mobility modes (as e.g. cycling, walking or car sharing). He stated that they have a noteworthy history – and proposed a look into it.

In his contribution "Spinning off the Path: The Failed Dream of Bicycle Paths in the 1890s and the Unintended Spinoff of a Combined Transportation System", James Longhurst demonstrated how interesting historical artifacts could make for a controversial debate today. He describes the development process of the cycle path movement, beginning in the United States in the 1890s. The promotion of separate cycle paths failed due to the political dispute about taxation for public infrastructure. Longhurst showed that today's combined American road system was not inevitable – there were plenty of alternatives in the past. His forgotten cycling history issue is absolutely up-to-date in our time of an unbowed bike riding trend.

The cycling debate was also addressed by Katalin Tóth in her presentation examining the uncertainties and challenges accompanying the introduction of new mobilities by the example of bike sharing in Budapest. She highlighted the impact of socio-cultural contexts and policy stakeholders, explaining that complex public reactions weakened support for the initiative and suggested a more demand- and user-oriented procedure by policy makers.

5 Transport Planning, Infrastructure and Smart Mobility

One panel brought transport planning into focus. Richard Harrison examined urban transportation planning in post-war Britain, explaining that the future of Britain was seen as being tied to road reorganization largely decided at transportation engineering conferences. The last paper, given by Cheryl Deutsch, looked at early metropolitan transport planning driven by engineering and sociology. Some examples of early research included origin and destination surveys and transportation studies to launch urban highways.

Another presentation that examined the past to understand present (and future) contexts was presented by Sharon Babian of the Canada Science and Technology Museum. The paper, titled "Navigation Made Easy? The Promise and Perils of Electronic Navigation at Sea", focused on mariners' use of Electronic Chart Display & Information Systems (ECDIS). After reviewing the early use of radar and the development of automatic radar plotting aids (ARPA), she discussed potential concerns with ECDIS, including deliberate jamming and disruptive anomalies. She concluded by indicating that there is increasing interest in eliminating crew through autonomous piloting technologies. Electronic systems – more specifically communication systems – were taken up on a separate panel by Kathleen Oswald who gave "A Brief History of Smart Transportation Infrastructure" that was followed by Markus Edelmann's and Silke Zimmer's paper on "Autonomous Driving from the Perspective of History and Technology Assessment". Together, the presentations opened up a vivid discussion on smart mobility.

On another panel, Lyubomir Pozharliev's paper "Collectivity vs. Connectivity: The techno-historical example of motorway peripherization in former Yugoslavia" illustrated intended and unintended effects of the development of a motorway infrastructure by Tito's regime during the Cold War. Pozharliev's main argument is that, in spite of the clear ideological objective to build a national identity by constructing motorways, it was not possible to envision what kinds of development a motorized individual transport system would trigger. He argues that it had the contrary effect in a process that reinforced the formerly strong urban economic areas and abandoned the few industrialized ones. Thus, it contributed to secessionist movements and tensions in the regions of Yugoslavia. Pozharliev demonstrated the undesirable consequences of an ideological overflow in a planning concept, in contrast to more open and integrated transport planning approaches. Interesting is the example for today's future mobility visions as it illustrates the well-existing tension between the appeal of possibilities and the variability of effects.

6 Conclusion

The interdisciplinary nature of the conference as well as the wide range of topics and approaches at times led to a feeling of being at many conferences at once. At the same time, conference attendees from around the world and in many disciplines took the opportunity to hear research outside of their usual areas of focus and emplace their work in a wider context that includes the development of rail networks before World War I, routine space flight in the 1980s, and the end of streetcar service in Detroit: all important moments in traffic, transport, and mobility. Working at the horizon of culturally impactful new mobilities, it is useful to reflect on a time when old technologies were new: how they were implemented, what they meant during historical times of technological change.

Also within the scope of technology assessment the conference had to offer interdisciplinary and global perspectives of multiple forms of mobility through time. These quite often were fascinating, even if the many goals of the individual papers and presentations were not always congruent. While the mission of interdisciplinarity was mainly fulfilled by juxtaposing papers from different disciplines on a panel rather than in the active connection of those approaches, T2M is working to strengthen these connections. At next year's meeting from September 14 to 17, 2015, T2M intends to counteract this trend with a deeper focus on methods as they join with the sociologist Cosmobilities Network in Santa Maria C.V. (Caserta), Italy, on the topic of "The Future of Mobilities: Flows, Transport and Communication".

Overall, this was a refreshing conference worth attending, particularly if one is interested in situating or understanding one's research more broadly in the long and diverse histories of traffic, transport and mobility that the T2M conference has to offer.

References

Hannam, K.; Sheller, M.; Urry, J., 2006: Editorial: Mobilities, Immobilities and Moorings. In: Mobilities 1/1 (2006), pp. 1–22

Edgerton, D., 2006: The Shock of the Old. Technology and Global History since 1900. London

« »

Der ländliche Raum als Schauplatz der Energiewende

Multidisziplinäre Perspektiven auf einen komplexen soziotechnischen Transformationsprozess

Bericht zur Tagung „Energiewende im ländlichen Raum – Ein Bürgerprojekt auf dem Prüfstand" an der Evangelischen Akademie Tutzing

Tutzing, 25.–26. Juni 2014

von Florian Braun, Universität Kiel, und Martin Knapp, ITAS

Der ländliche Raum als zentraler Ort für die Umsetzung der Energiewende stand im Fokus dieser Konferenz. Durchgeführt wurde sie in Kooperation mit dem Institut Technik-Theologie-Naturwissenschaften (TTN) an der LMU München und dem Technologie- und Förderzentrum (TFZ) am Kompetenzzentrum für Nachwachsende Rohstoffe Straubing. Veränderungen, Konflikte und Herausforderungen wurden einleitend von Akademiechef Frank Kittelberger, Stephan Schleissing (TTN) und Bernhard Widmann (TFZ) aufgegriffen.

1 Umsetzung der Energiewende im ländlichen Raum

Trotz der aktuellen Kontroverse rund um die Novellierung des Erneuerbare-Energien-Gesetzes (EEG) stimmen weite Teile der Gesellschaft v. a. aufgrund der Aussicht auf eine klimaneutrale Energieversorgung den allgemeinen Zielen der Energiewende weiterhin zu. Um das klimapolitische Ziel der Treibhausgasminimierung zu erreichen, müssen neben dem Stromsegment auch Wärme und Mobilität betrachtet werden. So stellt der v. a. in Süddeutschland zu weiten Teilen aus Biomasse gedeckte Bedarf an erneuerbarer Wärme eine wesentliche Anforderung an den ländlichen Raum hinsichtlich Produktion und Flächenbereitstellung dar.

Nichtsdestotrotz bahnen sich Konflikte an, je näher die Umsetzung konkreter Projekte an das Lebensumfeld der Bevölkerung rückt, das Land-

schaftsbild verändert wird oder Befürchtungen eines unkontrollierbaren Kostenanstiegs auftreten. Selbst engagierte Befürworter der Energiewende stehen dann dem Ausbau von Windparks und Stromtrassen skeptisch gegenüber. Wie die Notwendigkeit staatlicher Steuerung von Planungsprozessen mit dem Anspruch der Gesellschaft nach Mitsprache vereinbar ist und vor diesem Hintergrund geeignete Partizipationsformen ausgestaltet werden können, ist jedoch im Detail meist strittig.

Mit ihren Auswirkungen auf Gesellschaft und Individuum ist die Energiewende mehr als nur ein reines Technologieprojekt. Daher kommt der Beachtung von Werten und Zielkonflikten nicht nur bei konkreten Beteiligungsvorhaben eine entscheidende Bedeutung zu, sondern auch bei der Ausgestaltung der Energiewende im Allgemeinen. Neben einem tieferen Einblick in die Komplexität der hiermit verbundenen technischen Problemstellungen versprach die Tagung auch Antworten auf Fragen der Bedrohung vertrauter Vorstellungen von Natur und Heimat, der Bedeutung für die Zukunft der Landwirtschaft, den Zusammenhang mit einer nachhaltigen Agrarpolitik sowie darauf, was aus dem „Bürgerprojekt Energiewende“ zu lernen ist.

2 Werteorientierungen im Diskurs um die Energiewende

Fabian Karsch (TTN) besprach die „wertorientierte Kommunikation“ als Ansatz zur Beantwortung gesellschaftlich relevanter Fragen zur Energiewende. So könne die Nachhaltigkeitsfrage als ethisches Grundprinzip und als Leitbild zur Prüfung gesellschaftlicher Leitfragen dienen und den Akteuren bei der Selbstorientierung in der Energiewende helfen. Die mit ihr verbundenen Veränderungen reichen mittlerweile in alle Gesellschaftsbereiche, selbst in den Alltag. Laut Karsch dominieren im alltäglichen, die Energiewende betreffenden Abwägen vier prinzipielle Interessen: Wirtschaftlichkeit, Sozialverträglichkeit, Umweltverträglichkeit, Kulturverträglichkeit (etwa die identitätsstiftende Gestaltung des unmittelbaren Lebensraums als Energiekulturlandschaft). Entsprechend seien die Motive von Projektgegnern meist vielfältiger als die oftmals unterstellte Not-in-my-backyard-Haltung (NIMBY) evoziert. Mithilfe eines iterativen Vorgehens über differenzierte Szenarien und des Aufzeigens von Kompromisslinien müssen die sich in den Konflikten ausdrückenden vielfältigen Interessen in den politischen Diskurs integriert werden, wenn die Energiewende erfolgreich realisiert werden soll.

Dass hierbei einiges im Argen liegt, untermauerte Autor Andreas Möller („Das grüne Gewissen“) mit dem Argument, dass die CO_2-Emissionen trotz eines Anteils von 25 % EE-Strom und einer EEG-Umlage von 23 Mrd. Euro weiterhin ansteigen. Als Paradebeispiel für die vorgenannten Diskrepanzen nannte er die Situation in Bayern, dem Land, das einerseits Vorreiter in Sachen Photovoltaik sei, aber andererseits die größten Widerstände gegen Überlandstromtrassen aufzuweisen habe. Möller spannte einen Bogen zwischen zwei extremen Erscheinungsformen der Energiewende: der faktisch beobachtbaren „Eroberung der Natur“ durch die weitläufige Installation technischer Anlagen und dem bei vielen Bürgern aufkommenden Gefühl des Heimatverlusts angesichts des veränderten Landschaftsbilds. In einer breit angelegten kultur- und medientheoretischen Analyse wurden wichtige Konfliktherde nachgezeichnet, etwa die systematische Beschönigung der im Zuge der Energiewende auftretenden Umweltschäden oder der Gegensatz zwischen dem Bild industrialisierter Energielandschaften und dem durch die heutigen Medien vermittelten Bild der unberührten Natur: Großtechnische Windkraftanlagen würden als unvereinbar mit medial überhöhten Erholungsräumen, Hochspannungstrassen als Eingriffe in die angeblich naturnahe „Heimat“ wahrgenommen und daher abgelehnt. Möller warnte in kritischer Absicht sowohl vor idealistischen Überhöhungen als auch vor ökonomisch gelenkten Irreführungen im Energiewendeprozess.

3 Landschaftsarchitektur und Energiewendepolitik als ganzheitliche Ansätze

Ebenfalls unter Bezugnahme auf die landschaftlichen Aspekte der Energiewende plädierte Landschaftsarchitekt Sören Schöbel-Rutschmann (TU München) dafür, dass bei den umfassenden Eingriffen in das Landschaftsbild ästhe-

tischen Überlegungen ein höheres Gewicht eingeräumt werden sollte. Diese Forderung beruht auf dem Argument, dass in unserem sehr stark visuell geprägten Heimatbild Eingriffe durch Windkraftanlagen oder Hochspannungsmasten häufig als störend wahrgenommen werden, da sie die ursprünglichen morphologischen Leitlinien des Landschaftsbildes durchbrechen. Hingegen führe die Wahl von Standort, Höhe und Anzahl der technischen Anlagen nach landschaftsarchitektonischen Regeln zu erhöhter Akzeptanz, da man jene hierdurch als sinnstiftende Bestandteile des Landschaftsbildes erkennen könne. Neben der dialogsuchenden Kommunikation sollte in Planungsverfahren auch die gemeinschaftliche Abstimmung von Natur- und Kulturelementen zu einem harmonischen Gesamtbild forciert werden. Daher bedeutet Bürgerbeteiligung für Schöbel-Rutschmann nicht zuletzt die aktive „Mitgestaltung von Landschaftsräumen".

Dass hierzu eine konsistente Energiewendepolitik vonnöten ist, wurde durch Staatssekretär Franz Josef Pschierer (Bayerisches Wirtschaftsministerium) herausgestellt. Das bayerische Wirtschaftsministerium ziele auf eine Energiepolitik aus einem Guss, indem energierelevante Bereiche aus anderen Ministerien zu einem eigenständigen Kompetenzbereich zusammengeführt wurden. Dabei sei Bayern durchaus bestrebt, eine größtmögliche Eigenständigkeit in der Energieversorgung auch im Bereich der EE zu gewährleisten, indem die Abhängigkeit von Stromimporten vermieden werde. Zu diesen zählte Pschierer erstaunlicherweise auch den Windstrom aus Norddeutschland. Von außen betrachtet liegt hierin eine schwierige Aufgabe, da die landeseigenen EE-Potenziale – Photovoltaik (PV) und Verstromung von Biomasse – auch bei weiterem Ausbau den Strombedarf der starken bayerischen Industrie nicht decken können. Ungeachtet dessen geht die bayerische Energiepolitik auf Distanz zu wichtigen Elementen gesamtdeutscher Lösungsansätze, etwa dem Ausbau der Hochspannungstrassen. Pschierer umschreibt diese Haltung als Versuch, den hohen Energiebedarf des Industriestandortes Bayern mit dem Ziel einer umweltverträglichen und bezahlbaren Erzeugung unter besonderer Berücksichtigung der Landwirtschaft und der Biomasse-Erzeugung zu verbinden. Man setze auf die verstärkte Förderung von Strom- und Wärmeerzeugung (etwa durch KWK-Anlagen) sowie auf ein umfassendes Energieeffizienzprogramm für Kommunen.

4 Anforderungen an Energiepflanzenanbau und Landwirte als Akteure der Energiewende

Beate Formowitz (TFZ) und Carolin Riepl vom Netzwerkmanagement Bioenergie beim Landratsamt Straubing-Bogen analysierten in ihrem Beitrag den in Bayern angestrebten Nexus zwischen Landwirtschaft und Energiewende genauer. Im ersten Teilvortrag skizzierte Formowitz den historischen Wandel der Landwirtschaft. Die Industrialisierung der Landwirtschaft führte dazu, dass heutzutage weniger Biomasse für die Bioenergieerzeugung (12 %) eingesetzt werde als vor 100 Jahren für die Ernährung der Zugtiere (36 %). Das Verhältnis zwischen Energiepflanzen und klassischen Ackerkulturen hat sich also nicht verschlechtert, ungeachtet der Rede von der Vermaisung des ländlichen Raums. Formowitz' wichtiges Argument besagt, dass die Flächenfreisetzung durch den Wegfall der Futterproduktion ein erschließbares Biomasse-Produktionspotenzial birgt (auch unter Einbezug des erhöhten Bedarfs für die Fleischproduktion). Das Zögern der Landwirte, in die Bioenergieerzeugung zu investieren, sei wesentlich durch die unabsehbaren Gewinnchancen begründet. Biomasseproduktion wird sich laut Formowitz nur dann durchsetzen, wenn sie von den Landwirten eine langfristig sichere Einkommensquelle bietet.

Im zweiten auf Interviews mit Landwirten basierenden Teilvortrag bettete Riepl die ökonomische Charakterisierung des Landwirts in eine kulturtheoretische Erklärung ein. Die ökonomischen Entscheidungen der Landwirte seien durch einen übersättigten und durch staatliche Transferleistung geprägten Markt determiniert. In den letzten Jahrzehnten mussten Landwirtschaftsbetriebe stetig wachsen, um im Preiskampf und in der Flächenkonkurrenz bestehen zu können. Diese Marktsituation sei durch die Energiewende sowohl verschärft als auch entschärft worden: Einerseits müsse der Landwirt nun auf dem Pachtmarkt mit den finanzstarken Betreibern von Wind- und PV-Parks konkurrieren, andererseits

haben sich für ihn neue lukrative Erwerbsquellen eröffnet. Denn im traditionellen Hauptbetätigungsfeld, der Lebensmittelproduktion, ließen sich kaum noch Gewinne erwirtschaften. Ähnlich wie Andreas Möller sieht Riepl diesen Umstand in der gesellschaftlichen Wahrnehmung der Landwirtschaft begründet. Im Grunde oszilliert das mediale Bild der Landwirtschaft zwischen Lebensmittelskandalen, musealer Verklärung in einschlägigen TV-Produktionen und dem urbanen Anspruch auf perfekt gestylte Naherholungsgebiete. Die vom landwirtschaftlichen Alltag entfremdeten Verbraucher hinterfragen allzu häufig landwirtschaftlich notwendige Entscheidungen, verlangen tief greifende Strukturreformen und wollen dennoch – am Ende des Tages – keine Realpreise für diese Leistungen bezahlen. Die Suche nach neuen Erwerbsquellen lasse sich daher als Versuch erklären, sich der ökonomischen Abhängigkeit vom Meinungsbild der anscheinend widersprüchlich agierenden Verbraucher zu entledigen. Entsprechend haben viele Landwirte kein Problem mit den durch die Energiewende verursachten Veränderungen des Landschaftsbildes, wenn diese Maßnahmen dazu beitragen, ihr „Landleben“ ökonomisch nachhaltig zu sichern.

5 Regionale Wertschöpfung und Partizipation in Planungsprozessen

An diese ökonomischen Überlegungen anknüpfend beschäftigte sich Nina Hehn (Universität Bayreuth: Kompetenzzentrum, KlimaKom) in ihrem Vortrag mit der Frage, welche Möglichkeiten der regionalen Wertschöpfung EE-Projekte bieten. Als Grundlage dienten Hehn die Konzeptstudien zur Stadt- und Regionalentwicklung der beiden nordbayerischen Regionen Oberfranken-Ost und nördliche Oberpfalz. Beide eint, dass sie durch Schrumpfung und Abwanderungsprozesse geprägt sind und naturräumliche Potenziale zum Betrieb von etwa 1.000 Windkraftanlagen besitzen. In ihrer zentralen These konstatierte Hehn, dass eine optimale Ausnutzung der regionalen Wertschöpfung nicht nur die Akzeptanz gegenüber möglichen EE-Projekten erhöht, sondern auch einen erheblichen Beitrag zur Wirtschaftsentwicklung der Region leisten könne. Ein erster unmittelbarer Wertschöpfungseffekt trete durch den Bau, die Installation und die Wartung der Anlagen auf. Dieser Effekt sei umso stärker, je mehr Aufgaben von regionalen Firmen übernommen würden. Ein zweiter Wertschöpfungseffekt folge, wenn der regionale Geldabfluss durch lokale Energieerzeugung anteilig gemindert werden kann. Denn momentan fließt ein großer Teil des Geldes, das für den Energieverbrauch ausgegeben wird, aus beiden Regionen ab. Eine erhöhte regionale Geldzirkulation augmentiere die Kaufkraft vor Ort und führe so zu weiteren Sekundäreffekten. Anhand einer Analyse bereits realisierter Projekte konnte Hehn feststellen, dass die Höhe der regionalen Wertschöpfung einerseits mit der Länge der Wertschöpfungskette und andererseits mit der Höhe des regional aufgebrachten Eigenkapitals in der Umsetzung der Projekte korrespondiere. Vor diesem Hintergrund schätzt sie das Wertschöpfungspotenzial durch den Ausbau der EE in Nordbayern, insbesondere der Windkraft, auf 350 bis 428 Mio. Euro.

In der von Stephan Schleissing (TTN) und Bernhard Widmann (TFZ) moderierten Diskussionsrunde unter dem Titel „Die Energiewende als Bürgerprojekt“ knüpfte Marius Strecker (Netzagentur TenneT) kritisch an Nina Hehns Überlegungen an. Häufig würden die mit der Energiewende verbundenen Infrastrukturprojekte erst in das Bewusstsein der Bürger treten, wenn sie unmittelbar davon betroffen seien. Aus verwaltungsrechtlicher Sicht können sie dann nur noch wenig Einfluss auf die Ausgestaltung der Projekte nehmen, weil der Planungsprozess bereits sehr weit fortgeschritten ist. Solche Erfahrungen verstärkten die generelle Ablehnungshaltung gegenüber Infrastrukturprojekten in der Bevölkerung. Wolfgang Schürger (Umwelt- und Klimabeauftragter der Evangelisch-Lutherischen Kirche in Bayern) verwies anschließend darauf, dass nur ein frühzeitiger Einbezug der Bürger durch Informationsveranstaltungen solche Situationen wenn auch nicht komplett vermeiden, so doch wenigsten entspannen könne. Hubert Weiger (BUND) hob hervor, dass im Gegensatz zu den momentan politisch in den Vordergrund gerückten großen Lösungen das dezentrale Potenzial in der Erzeugung der EE wieder verstärkt betont werden sollte. Gerade ein Netzausbau im Mittel- und Niederspannungsbereich sei in Verbindung

mit der EE-Erzeugung vor Ort zu bevorzugen, um einen unnötigen Bau von Hochspannungstrassen zu vermeiden. Strecker hielt dagegen, dass eine erfolgreiche Umsetzung der Energiewende dennoch eines erheblichen Ausbaus des Hochspannungsnetzes bedarf. Aus dieser Notwendigkeit heraus versuchen die Netzbetreiber, die Planungsverfahren so transparent wie nie zuvor zu gestalten.

6 Fazit aus zweierlei Perspektiven

Ministerialdirigent Maximilian Geierhos (Bayerisches Staatsministerium für Ernährung, Landwirtschaft und Forsten) griff in einer Art Gesamtfazit aller Vorträge nochmals den Tagungsschwerpunkt auf. Er unterstrich hierbei, dass im Zuge der Energiewende das Potenzial des ländlichen Raums ersichtlich geworden sei, die urbanen Räume mit Energie zu versorgen und zwar mit Strom, mit Wärme und in Grenzen auch mit mobilen Kraftstoffen. Die Politik könne durch entsprechende Rahmenbedingungen dazu beitragen, durch die damit verbundene Wertschöpfung die ländlichen Räume wirtschaftlich zu stärken und unabhängiger von staatlichen Transferleistungen zu machen. Eine nachhaltige ökonomische Perspektive für die Bürger in den ländlichen Regionen würde sich fraglos positiv auf die Akzeptanz von Energiewendeprojekten auswirken. Die Energiewende führe somit indirekt zu einer Renaissance von sozialen Gemeinschaftsinitiativen wie Energiegenossenschaften und Bürgerwindparks.

In der abschließenden Fragerunde wurde trotz der breiten Streuung der Fragethemen der Konsens zwischen Beitragenden und Tagungsbesuchern deutlich, dass sich sowohl die überregionalen wie auch regionalen Infrastrukturprojekte der Energiewende nur mit Zustimmung der Bürger umsetzen lassen. Nur als „Bürgerwende" könne laut Hubert Weiger das Generationenprojekt Energiewende langfristig erfolgreich sein. Offen blieb allerdings, wie die Partizipation potenziell betroffener Bürger adäquat auszugestalten sei. Dies wurde v. a. in der Diskussion um Planungsprozesse ersichtlich. Ausführlich adressiert waren hingegen die Themen „Flächenbereitstellung und Biomasseproduktion durch die Landwirtschaft", sowie „werteorientierte Kommunikationsansätze bei Konflikten und Herangehensweisen zur Kompromissfindung". Ganzheitliche Herangehensweisen zum Umgang mit lokalen Konflikten in der Umsetzung der Energiewende wurden jedoch nur ansatzweise aufgezeigt. Ein systematischer Zusammenhang von Energiewende und nachhaltiger Agrarpolitik konnte im Rahmen der Veranstaltung nicht wirklich gestiftet werden.

Dennoch ermöglichte die Tagung „Energiewende im ländlichen Raum" durch die Diversität der Beiträge hinsichtlich der behandelten Themen und der Untersuchungsansätze einen Einblick in die Konfliktfelder und die Herausforderungen, mit denen sich die involvierten Akteursgruppen im Rahmen der Energiewende konfrontiert sehen. Eine wesentliche Schlussfolgerung der Tagung lautet, dass der ländliche Raum nicht nur der zentrale Ort der Umsetzung der Energiewende ist, sondern dass ohne die konstruktive Lösung der dort anfallenden Problemstellungen die Energiewende nicht erfolgreich umgesetzt werden kann. Die in den anregenden Vorträgen und Diskussionen vorgestellten Lösungsoptionen gaben einerseits mögliche Entwicklungspfade vor und zeichneten andererseits ein differenziertes Bild der Thematik. Diese Lösungsansätze bleiben jedoch in Teilen an die geographischen, wirtschaftlichen und auch verwaltungsrechtlichen Rahmenbedingungen im Bundesland Bayern zurückgebunden, auf das sich die Konferenz konzentrierte. In ihnen spiegelt sich aufgrund der fortgeschrittenen Entwicklung der Energiewende in diesem Bundesland nicht zuletzt ein starkes Engagement von Bürgerinnen und Bürgern v. a. im ländlichen Raum wider. Dadurch ergab sich eine beispielhafte Veranschaulichung der Komplexität der mit der Energiewende einhergehenden soziotechnischen Transformation und der im Spannungsfeld gesellschaftlicher Notwendigkeiten, politischer Vorgaben und wirtschaftlicher Anforderungen entstehenden Aufgaben. Diese zu lösen, das wurde während der Tagung letztlich deutlich, kann allerdings nicht nur Aufgabe der Akteure am eigentlichen Ort des Geschehens bleiben, sondern verlangt eine gesamtgesellschaftliche Fokussierung der Eigenheiten ländlicher Energieerzeugung.

« »

Responsible Research and Innovation – Perspectives and Challenges

Report on the S.NET 6th Annual Meeting: "Better Technologies with No Regret?"

Karlsruhe, Germany, September 21–24, 2014

by Antonina Khodzhaeva, Martin Sand, Maria João Maia, Silvia Woll, Gabriel Velloso, and Daniel Frank, ITAS

1 Addressing Normativity

New technologies can potentially provide solutions to old and new problems, but at the same time they are associated with controversies, uncertainties and risk. Assessment of emerging technologies regarding possible consequences is therefore very important for achieving "better technology (in a better society)" (Schot/Rip 1997, p. 256). The field of technology assessment (TA) is already known for providing evaluation of intended and non-intended impacts of new technologies, and various approaches to TA have already been developed to serve this purpose. However, in recent years the concept of Responsible Research and Innovation (RRI) has become very popular, in particular in the European policy context. It is suggested to represent the standard of European technology governance. The concept of RRI, largely based on the TA tradition, has qualified as an umbrella term, incorporating not only TA, but also Science, Technology and Society (STS) studies (cf. Grunwald 2011). Thus, the emergence of this concept indicated a turn from the debate on managing risk to managing the whole innovation process, a development also reflected in the program of the 6th Annual Meeting of the Society for the Study of Nanoscience and Emerging Technologies (S.NET). The authors of the report of the first Annual Meeting of the S.NET in 2009 questioned, "(…) whether the S.NET's attempts to bridge the gaps between different disciplines and occupational fields will achieve sustained success" (Coenen/Yang 2010, p. 205). It is now for the sixth time that the Society brings together scholars and practitioners from the natural sciences, social sciences and humanities as well as from various scientifically interested societal groups. This year's Annual Meeting of the S.NET was held under the striking title: "Better Technologies with No Regret?" Regret is usually understood as a moral sentiment triggered by conscience. It refers to actions and decisions in the past and is associated with feelings of discomfort. Regret occurs when things went wrong and it is too late to revise them. It is symptomatic that the Society has picked this title. It refers to rational anticipatory planning and the individual's relation to faulty actions. Regret is – just as responsibility and consternation – not transferable, and this applies both to actions in private and public life. Thus, the motto underscored the aim of the conference, namely to critically assess a broad spectrum of emerging technologies and analyze the role of policy makers and stakeholders in this process. It also expressed the normative dimension of RRI which, with all its intrinsic difficulties, was at the forefront of the conference. The meeting took place at the Institute for Technology Assessment and Systems Analysis (ITAS) in Karlsruhe.

2 Discussion of Sessions

With more than 20 sessions and several workshops as well as a film screening, the conference covered a wide spectrum of topics, which will be summarized in the following.

ELSI Aspects of New and Emerging Technologies

Technical innovation cannot be shaped only by economic and commercial interests. Broad ethical, legal and societal implications (ELSI) should also be considered in the complex process of innovation. In this context, a broad range of new and emerging technologies – from epigenetics (*Stefanie B. Seitz*), to emerging body technosciences (*Bárbara Nascimento Duarte*), brain-computer interfaces (*Gabriel T. Velloso*), personalized cancer medicine (*Anne Blanchard*), and synthetic biology (*Luciano Kay* and *Jennifer Woolley*; *Celso Gomes*) – were discussed in various sessions. For the first time in the history of S.NET conferences, a session was dedicated to the emerging

and vast field of robotics. *Florian Kreuchauff* and *Ingrid Ott* presented the case of service robotics and the problem of effective policy recommendations resulting from gaps in definition and classification of "service robots". *Maria João Maia* and *Bettina-Johanna Krings* presented the specific case of surgical robots and the consequences of introducing these teleoperated systems in an operating room theater, namely in terms of work organization, qualification of human resources, and new man-machine interfaces. They reflected on the shifts medicine is facing on different levels with the introduction of such robots, highlighting the need to deepen the knowledge of such consequences and the role technology assessment can play in this quest. The presentation by *Kjetil Rommetveit*, *Kristrún Gunnarsdottir*, *Niels van Dijk*, and *Martijntje Smits* addressed the ways of defining a robotics agenda, which meets the RRI criteria and would be beneficial for society.

Responsible Research and Innovation

In the recent years, the concept of RRI has become very prominent, leading to a shift in science, technology and innovation policy in Europe. However, in order to apply this concept in practice, many conceptual challenges must be overcome. Several papers address the conceptualization of terms like "responsibility" and "responsible", which are rather vague, and lead to the assumption that previous research was not responsible (*Stephan Lingner*; *Tsjalling Swierstra*). *Zoë Robaey* highlighted the responsibility of the owners – "the ones purposely carrying out an action with a technology" – for hazards of Genetically Modified Organisms (GMOs). *Robaey* argued that the relationship between the concept of responsibility and the concept of ownership had not yet been considered appropriately. Regulatory tools are necessary in order to incorporate "responsibilization" into the governance of RRI (*Bärbel Dorbeck-Jung*). Viewing innovation as a non-linear, complex process can also have implications for the RRI concept (*Boenink et al.*). *Stevienna de Saille* approached the inclusion of the "unruly" public, such as activists, bloggers, independent researchers, etc., in R(R)I by analyzing their perception and understanding of responsible innovation and the differences between the questions they raise and the ones raised by "traditional" stakeholders. Some papers presented at the conference addressed the practical implementation of the concept in such projects as NanoNextNL in the Netherlands (*Bart Walhout*), where Risk Analysis and Technology Assessment (RATA) was part of the research agenda. One consequence of implementing RRI is the involvement of researchers from the social sciences and humanities at early stages of research and in the assessment of emerging technologies. The paper by *Susan Molyneux-Hodgson* investigated the experiences of a sociologist working with scientists and engineers in a synthetic biology research project. In her contribution, she explored how the notions of responsibility were approached in this context. *Rob Lubberink* presented the preliminary ideas of his PhD project, in which he wants to challenge RRI from an economic perspective.

Participation, Stakeholders

Technology and innovation governance is becoming more democratic and open. Engaging a wide range of stakeholders in processes of responsible research and development of technologies, however, is not always easy. Differences among stakeholders can limit their ability to cooperate and form partnerships. *Vincent Blok* conceptualizes participation and partnerships by employing Emmanuel Levinas's perspective. The role of non-governmental organizations (NGOs) in the governance of new technologies is also changing, as demonstrated in the case of nanomaterials in the context of occupational health and safety (OHS) (*Aline Reichow* and *Diana M. Bowman*). *Mitsuru Kudo* presented a model of stakeholder engagement in science, technology and innovation (STI) policy topics in Japan based on public dialogue. *Tom Wakeford* in the session on GMOs addressed the role of non-scientific knowledge in public debates on food systems.

Acceptance

As long as a technology is not accepted, its potential benefits cannot be reaped, and there seems to be a gap between the acceptance by professionals

and the acceptance by laypeople. The results of three medical studies show that technoscientific methods and applications are not uncritically taken as being of benefit in society. The acceptance of nanotechnology and cognitive enhancement in a medical context depends on factors such as the fear of the disease to be treated, the person's background as a patient or a healthcare professional, and the intention of the treatment. In their study, *Marie-Sol Poirier*, *Vanessa Chenel*, *Johane Patenaude*, and *Patrick Boissy* pointed out that acceptance can be defined in two ways: individual acceptance (intention of use) and social acceptance (what is desirable for society). Focusing on the results of the study, healthcare professionals are less in favor of the treatment based on carbon nanotubes (CNTs) in regard to its benefits for society. On the contrary, patients were favorable for the use of the treatment in terms of individual, as well as social acceptance. The study also demonstrated the relationship between purpose and context of use: respondents felt more comfortable using carbon-based nanocarriers to treat lung cancer than to treat influenza. *Laura Y. Cabrera*, *Nicholas S. Fitz*, and *Peter B. Reiner* pointed out in their presentation that participants rather agreed with a close friend using an enhancement pill if the intervention was described as ETN (enhancing to the norm) than when described as EAN (enhancing above the norm). *Cabrera et al.* made clear "that people are sensitive to variations of enhancement, and as such, if we are to have a more coherent ethics of enhancement, we have a social responsibility to explore further how these differences affect public attitudes towards enhancement".

Visionary Technoscientific Practices, Futures and Imaginaries

In recent years, an increasing number of publications have dealt with the visionary aspects of new and emerging technologies. Building on the works in Leitbild assessment on the one side and the Sociology of Expectations on the other side, those studies tried to explain the impact of visions on technological development. Providing a clear differentiation between such concepts as visions, imaginaries and meanings of scenarios remains a great challenge for the community. Imagination and responsibility for visionary practices, addressed by *Arianna Ferrari* and *Laura Y. Cabrera*, were not further discussed at the conference. This might deserve more attention at upcoming S.NET conferences. Besides visions, ideas, and ambitions – topics that have always been in the focus of the S.NET community –, imagining futuristic scenarios is a crucial element in the history and development of science. Fictional narratives have often inspired scientific approaches, and the way people imagine processes can initiate changes in science and research. *Rasmus T. Slaattelid* and *Alexei Grinbaum* used historic narratives to explain the mnemonic function of images (*Slaattelid*) and to emphasize the meaning of scientists' responsibilities and their limitations (*Grinbaum*). *Zach Horton* reflected on the question, whether one can look at the nanotech as an ecosystem by examining the debate between Richard Smalley and K. Eric Drexler. *Michael G. Bennett's* talk emphasized the importance of future-oriented approaches such as the assessment of possible futures and deployment of future figures and pointed out the possible benefits of future-oriented studies for legal practice and research.

Workshops and Film Screening

The conference included several workshops on Biohacking/DIY Biology, Life Cycle Assessment, and RRI. A group of DIY biologists (*Rüdiger Trojok*, *Malthe Borch*, *Nora Vaage*, *Ana Delgado*) hosted a hands-on workshop on biohacking. The idea of the workshop and subsequent discussion session was to explore the crisis of antibiotics resistance and how to "hack" our way out of it. The workshop offered a unique opportunity to engage with DIY biology and biohacking activities. It also made a valuable contribution to understanding the role of the RRI concept from a citizen science perspective. It became clear from the discussions that as science and innovation become more open source and open access, challenging issues and questions arise, which should be further addressed. The "Advancing Life Cycle Assessment for RRI" workshop was organized by *Marcel Weil*, *Rider Foley*, and *Ben Wender*. The participants were divided in groups and had to work on four different themes: (1) Values in

Environmental LCA; (2) Data, Gaps, Assumptions, and Future Research Directions; (3) Filling the Toolbox; (4) Integrating Disparate Data to Inform Decisions. The activities always concluded with a brief discussion and summary. *Christoph Schneider* and *Julia Hahn* organized a very vivid and participative workshop in cooperation with *FabLab Karlsruhe* on "Hacking Responsible Innovation". Doorbells and assumptions made prior to their installation at a house entrance served as an example. Framing the problem (e.g. when different stakeholders are involved, such as children, disabled or blind persons) and coming up with solutions were some of the tasks the different groups had to work on, keeping in mind responsibility in the innovation process. Very interesting workshops allowed for different perspectives to be discussed. On the last day, several chapters of the film "Swerve" (directed by *Zach Horton*) were screened. The story of this film is set in the future, where reality merges with the virtual world in a nano-contaminated zone. The film screening was one of the highlights of the S.NET conference. Film is another medium that can help reflect on the implications of new technologies.

3 Outlook

The S.NET conference came up with a couple of refreshing formats such as a Biohacking workshop, a Film Screening Session with the director, and interactive workshops with members of *FabLab Karlsruhe*. The international and interdisciplinary community participating in the lively discussions during the conference opened up fruitful perspectives and interesting questions about new and emerging technologies. Both discussions and presentations maintained high quality throughout. At upcoming S.NET conferences, the economic perspective on RRI should receive increased attention. Innovation from an economic perspective has, with a few exceptions (e.g. *Rob Lubberink*), been neglected. Unfortunately, the feeling that the engineering perspective developed by the participants of the Life Cycle Assessment workshop was somehow separated from the rest of the conference did not vanish. Here is room for improvement. The rather untypical perspectives developed in the keynotes of *Andy Stirling* and *Sarah Davies* inspired the participants to think innovation processes and technological development from completely different angles. While both presenters had proposed to think of innovation processes without any form of top-down normative approach or highly structured governance, the common challenges and dilemmas soon reappeared in the subsequent discussions. Supposing that innovation processes are to be described in the absence of governance, how can we then meet the requirements of RRI? If TA is supposed to give advice on the "right" impacts of emerging technologies and participatory research, and to develop a framework for stakeholder and public involvement in the process of shaping these technologies, how can this be accomplished with reference to a rather deterministic picture of innovation? Between action, reaction and pro-action, the right attitude towards new and emerging technologies is still too be found. This remains the challenge also for the upcoming conferences of the Society. The next S.NET conference should take place in October 2015 in Montreal. We are looking forward to it.

References

Coenen, C.; Yang, M., 2010: S.NET: A (Post-) Academic Society for the Study of Emerging Technosciences: Report on the first S.NET Conference, Seattle 2009. In: Fiedeler, U.; Coenen, C.; Davies, S.R. et al. (eds.): Understanding Nanotechnology: Philosophy, Policy and Publics. Heidelberg, pp. 199–209

Grunwald, A., 2011: Responsible Innovation: Bringing Together Technology Assessment, Applied Ethics, and STS Research; http://www.itas.kit.edu/pub/v/2011/grun11c.pdf (download 26.1.15)

Schot, J.; Rip, A., 1997: The Past and the Future of Constructive Technology Assessment. In: Technological Forecasting and Social Change 54/2–3 (1997), pp. 251–268

« »

Ethik des Essens: In-vitro-Fleisch und „verbesserte Tiere“

Bericht zur Konferenz „The Ethics of In-Vitro Flesh and Enhanced Animals Conference“

Rothbury, UK, 18.–19. September 2014

von Arianna Ferrari, ITAS

Landwirtschaftliche Tierproduktion und Nachhaltigkeit sollen eng zusammen gehören, so lautet die Botschaft einer zunehmend wachsenden wissenschaftlichen Gemeinschaft. Welchen Beitrag können neue biotechnologische Entwicklungen dazu leisten? Inmitten der schönen Landschaft Northumberlands fand eine vom „Wellcome Trust“ gesponserte Konferenz über die Ethiken von In-vitro-Fleisch und der gentechnischen Verbesserung von Tieren statt.[1] Der Organisator Jan Deckers, Senior Lecturer in Health Care Ethics an der School of Medical Education der Universität von Newcastle, arbeitet seit einiger Zeit an dieser Schnittstelle zwischen Tierproduktion und Nachhaltigkeit. Auf der von ihm organisierten Konferenz stand das Thema In-vitro-Fleisch im Mittelpunkt, auf welches sich die Mehrheit der Vorträge und Diskussionen konzentrierte. In-vitro-Fleisch steht somit auch im Fokus dieses Berichtes.

Bevor ich zu den auf der Konferenz diskutierten Fragestellungen komme, ist es zunächst notwendig, bestimmte fachspezifische Fakten über die aktuelle In-vitro-Fleisch-Forschung zu präsentieren.

1 In-vitro-Fleisch: Tissue-Engineering für die Ernährung

In-vitro-Fleisch bezeichnet das Verfahren, Fleisch aus der Entwicklung von Geweben im Labor zu gewinnen. Solche Gewebe sind Ergebnisse eines Wachstumsprozesses in einem Bioreaktor, in dem Muskelstammzellen aus Tieren in einem Kulturmedium stimuliert werden (Datar/Betti 2010). Bereits 1932 stellte sich Winston Churchill in seinem Buch „Thoughts and Experiments“ eine Zukunft vor, in der die Tötung von Tieren zum Fleischgewinn durch wissenschaftstechnische Innovationen überflüssig geworden sei. Nach den ersten konkreten Untersuchungen der NASA in den 1950er Jahren (zur Gewinnung alternativer Ernährungsformen für Astronauten), wurde die Herstellung von Skelettmuskeln und anderen Geweben wie Knochen, Knorpel sowie fett- und fadenförmigen Geweben durch die Entwicklung von drei Forschungsbereichen (Isolierung von Stammzellen, Zellkultur ex-vivo und Tissue Engineering) möglich (Post 2012). Ein Durchbruch innerhalb der Forschung gelang im August 2013, als Mark Post und seine Forschungsgruppe an der Universität Maastricht in einer Pressekonferenz einen Burger vorstellten, der gänzlich aus Muskelstammzellen von Rindern im Labor herangezüchtet wurde (Post 2014).

Heutzutage können tierische Zellen in Bioreaktoren bis zu einer Größe von 20m^3 kultiviert werden (van der Weele/Tramper 2014), wobei man von der Kommerzialisierung des In-vitro-Fleisches aus technischen und ökonomischen Gründen noch weit entfernt ist. Die drei größten technischen Hürden sind derzeit: 1) die Auswahl geeigneter Zellen und die daraus folgende Entwicklung kostengünstiger Wachstumsmedien; 2) die Herstellung von lebensmittelverträglichen und essbaren Gerüsten, die notwendig für Haftung, Wachstum und Reifung der Zellen sind; 3) die Entwicklung geeigneter Bedingungen für eine Massenproduktion der Zellen und Gerüste (Post 2012). Die Realisierung des oben erwähnten Burgers von Post kostete 325.000 US-Dollar (Fountain 2013).

2 Die Probleme heutigen Fleischkonsums

Spätestens seit der Veröffentlichung des Berichtes der UN-Landwirtschaftsorganisation FAO „Livestock’s Long Shadow“ im Jahre 2006 (Steinfeld et al. 2006) gibt es in der wissenschaftlichen Gemeinschaft ein wachsendes Bewusstsein, dass der aktuelle und zukünftig prognostizierte Konsum tierischer Produkte (insbesondere von Fleischprodukten) gravierende Auswirkungen auf die Umwelt haben wird (vgl. u. a. FAO 2014; Eshel et al. 2014). Die Nutztierhaltung trägt weltweit mit 18 % zu den anthropogen verursachten Emissionen von Treibhausgasen (THG) bei, insbesondere durch CO_2 aus Brandrodung von (Tropen-)

Wäldern für Futtermittelanbau und Weideland, Lachgas aus dem Einsatz von Düngemitteln zum Futtermittelanbau sowie Methan aus dem Verdauungsapparat der Wiederkäuer (Steinfeld et al. 2006). Unter besonderer Aufmerksamkeit steht die Nutzung von Stickstoff-Düngemitteln, die höhere Erträge ermöglichen, aber über die Austräge in Boden und Wasser schwerwiegende Folgen für die Gesundheit von Menschen haben können (Bouwman et al. 2013). 79 % bis 88 % der gesamten Emissionen von Ammoniak, Nitraten und Dickstickstoffoxid der europäischen Landwirtschaft stehen im Zusammenhang mit der Nutztierhaltung (Westhoek et al. 2014). Darüber hinaus wird zunehmend auf die ineffiziente Umwandlung von Nahrungskalorien (in Form von pflanzlichem Futter) in Fleisch und auf das Problem der Übernutzung von Agrarflächen durch Weideland hingewiesen. Die Kalorien, die bei der Umwandlung von pflanzlichen in tierische Lebensmittel verloren gehen, könnten theoretisch 3,5 Milliarden Menschen ernähren (UNEP 2010).

In den letzten Jahren stellen immer mehr Studien einen Zusammenhang zwischen übermäßigem Fleischkonsum und Übergewicht, Herz-Kreislauf-Erkrankungen, Hypertonie oder Diabetes Typ 2 her (u. a. Reynolds et al. 2014). Nicht zuletzt sind ethische Probleme in Bezug auf die Haltung und Tötung von Tieren aufgrund der zunehmenden Technisierung der Tierproduktion zu nennen, die von der Kastrierung männlicher Ferkel ohne Betäubung, über die Entfernung der Hörner von Kälbern oder die Kürzung der Schnäbel von Küken und Mastputen bis hin zu den Auswirkungen der Hochleistungszucht und zu schlechten hygienischen Bedingungen und einem wachsenden Antibiotikaeinsatz reichen (u. a. Fraser 2005).

3 In-vitro-Fleisch als ökologisch vorteilhafte und tierfreundliche Innovation

In-vitro-Fleisch wird als Innovation präsentiert, die auf der ökologischen, gesundheitlichen und ethischen Seite Erfolge verspricht. Bei der Laborfleisch-Premiere in London erklärte Mark Post, dass sein Burger in drei Monaten hergestellt wurde, „schneller, als eine Kuh heranwachsen kann“. Von dieser Premiere ist auch ein Video auf YouTube frei verfügbar[2]. Ebenso scheinen veröffentlichte Zahlen eine sehr positiv Ökobilanz nahezulegen: Die Produktion von 1.000 kg In-vitro-Fleisch zeigt demnach im Vergleich zur konventionellen Fleischproduktion einen geringeren Energieverbrauch (nach diesen Schätzungen kann mit Einsparungen zwischen 7 % und 45 % gerechnet werden), einen deutlich geringeren Ausstoß von Treibhausgasen bei der Herstellung (geschätzte Einsparungen zwischen 78 % und 96 %), einen deutlich geringeren Landverbrauch (Senkung um ca. 99 %) und einen deutlich geringeren Wasserverbrauch (Senkung zwischen 82 % und 96 %) (Tuomisto/Teixeira de Mattos 2011). Auch gesundheitlich könnte In-vitro-Fleisch besser als das traditionelle Fleisch abschneiden: Da der Prozess im Labor stattfindet, wäre der Einsatz von Antibiotika oder anderer Mittel, die heutzutage bei der Fleischproduktion im Einsatz sind, überflüssig. Ergänzend wäre eine vorteilhafte Anreicherung des Fleisches mit zusätzlichen Komponenten (wie z. B. Vitamin B12) bzw. neuen Eigenschaften denkbar (Post 2012). Dies könnte zudem zur Ausbildung neuer Marktzweige führen. Schließlich wird In-vitro-Fleisch als „tierfreundlich“ beworben: Für Fleisch müssen keine Tiere mehr sterben (Post 2012).

4 Themen und Thesen

4.1 Die Motive der ForscherInnen

Im Mittelpunkt der Konferenz standen die ethischen und gesellschaftlichen Aspekte von In-vitro-Fleisch, insbesondere die behaupteten ökologischen und tierethischen Vorteile. Der Soziologe Niel Stephens (Universität Cardiff) berichtete über die unterschiedlichen Motive der In-vitro-Fleisch Forscher, die er im Laufe eines Projekts interviewt hatte. ForscherInnen dieses Bereichs kommen nicht nur aus der akademischen Forschung, sondern auch aus Start-p-Unternehmen in der biotechnologischen Branche, die zum Teil mit einem tierschützenden Ziel gegründet worden sind, wie beispielsweise die amerikanische Firma New Harvest. Sehr interessant war seine Darstellung von der Art und Weise wie ForscherInnen die wichtigsten Vorteile der In-vitro-Fleisch-Innovation jeweils auf der Basis ihrer eigenen wissenschaftlichen Kompetenz beschreiben: Die

Tissue Engineering- oder Stammzell-ExpertInnen betonen die Notwendigkeit, die genetische Ausstattung der Tiere zu kontrollieren, und somit suggerieren sie indirekt, dass Zucht und Nutzung von Tieren doch auch für In-vitro-Fleisch unvermeidbar seien. Dagegen betonen die ForscherInnen, die eine Tierschutz- oder Tierrechts-Position verteidigen, dass diese Innovation eine realistische und vergleichsweise schnellere Lösung für die Tötung und das Leiden von Tieren biete, als die Erwartung, dass die ganze Welt sich in naher Zukunft vegetarisch oder vegan ernähren wird. Stephens, der gerade an einer neuen Veröffentlichung über die Versprechungsnarrative in der Forschung hinsichtlich der Nachhaltigkeit dieser Innovation arbeitet, zitierte diesbezüglich einen Forscher von New Harvest wie folgt: „In-vitro meat is better than tofu because people will eat it; if it is not meat then they will not eat it."

4.2 Akzeptanz der Öffentlichkeit?

In ihrem Vortrag berichteten Clemens Driessen und Core van der Weele aus der niederländischen Universität Wageningen von einigen, noch nicht veröffentlichten Ergebnissen ihrer Arbeit mit Fokusgruppen und betonten dabei insbesondere die Komplexität dieses Themas und die widersprüchlichen ethischen Antworten der Öffentlichkeit. Die untersuchten ForscherInnen betrachten die öffentliche Skepsis als ein großes Problem und befürchten, dass diese Innovation gar nicht akzeptiert werden könnte. Driessen und van der Weele sehen im Gegenteil in dieser „moral ambiguity" nicht notwendigerweise eine Hürde für die technische Innovation, sondern auch eine Chance: In-vitro-Fleisch kann für sie deswegen als ein Mittel für das gesehen werden, was in der Literatur als „techno-moral change" (Lucivero et al. 2011) bezeichnet wird, und zwar als ein Mittel zur Sensibilisierung der BürgerInnen für den ökologischen Schaden und die tierethischen Probleme der „traditionellen" Fleischproduktion. Eine dezidiert positive Meinung vertritt der Philosoph George Owen Schaefer aus Oxford, der für die Notwendigkeit dieser Innovation aus utilitaristischer Sicht argumentierte. Ziel seines Plädoyers war es, die skeptischen VegetarierInnen und VeganerInnen zu überzeugen: Owen forderte auch eine eventuelle Zusammenarbeit mit Fleischkonzernen wie McDonald's, um diese Innovation zu verbreiten.

Eine gegenübergestellte Meinung vertritt die Politikwissenschaftlerin Amanda Cawston aus Cambridge. Sie zeigte, wie die Unterstützung dieser Innovation eigentlich zur Instrumentalisierung der Tiere führt, anstatt Respekt für diese einzufordern. Auch wenn weniger Tiere genutzt werden, wird durch diese Innovation laut Cawston immer noch die Wahrnehmung von Tieren als Fleischlieferanten perpetuiert, deren Körperteile problemlos konsumiert werden können.

4.3 Um In-vitro-Fleisch zu analysieren, braucht man eine Auseinandersetzung mit Fleisch

In-vitro-Fleisch zielt darauf hin, den heutigen Fleischkonsum zu ändern bzw. zu ersetzen. Um zu verstehen, ob und wie das in Zukunft nicht nur technisch, sondern ethisch und gesellschaftlich funktionieren kann, braucht man auch eine Auseinandersetzung mit dem Fleischkonsum an sich. Lars Øystein Ursin (Department of Public Health and General Practice an der Norwegian University of Science and Technology) trug dementsprechend über die Ontologie von Fleisch vor: Fleisch ist ein natürliches Symbol, das seine Reputation aus dem Tötungsakt als Herrschaftsakt gewinnt. Fleisch gilt als Symbol für Überlegenheit aber auch für Ambivalenz, indem es in vielen Narrativen heutiger Nutztierhaltung auch um den Sinn eines tiefen Verbundenseins mit den Tieren geht. Verliert Fleisch an seiner Reputation, indem seine „Natürlichkeit" in Frage gestellt wird, dann können andere Werte an Bedeutung gewinnen. Somit könnte die Idee eines anderen Fleischs, wie In-vitro-Fleisch, akzeptiert werden, dessen Herstellung weniger „natürlich", dafür aber sicher und vor allem gewaltfrei ist. Dass Fleisch und In-vitro-Fleisch unterschiedlicher kultureller Einbettungen bedürfen, wurde auch in der literaturwissenschaftlichen Analyse von John Miller (University of Sheffield) klar: Das Verhältnis zwischen Mensch, Tier und Technik kann nicht nur aus der Perspektive des Zweck-Mittel-Verhältnisses erklärt werden, sondern muss auch den Aspekt der Zuneigung (affection) mit einbeziehen: Da die Idee von In-vitro-Fleisch darin besteht,

aus wenigen Zellen viel Gewebe und potenziell unbegrenzt biologisches Material zu gewinnen, zielt sie darauf hin, die Möglichkeit einer anderen Konsumerfahrung zu eröffnen, bei der das Individuum materielle Grenzen überschreiten kann.

Arianna Ferrari konzentrierte sich in ihrem Beitrag auf die Analyse des visionären Charakters dieser Innovation, insbesondere was die Auswirkungen auf das Mensch/Tier-Verhältnis betrifft. Obwohl die Umsetzung dieser Innovation als Überwindung der Notwendigkeit zur Tötung von Tieren propagiert wird, bleiben viele Unklarheiten in Bezug auf die Frage bestehen, ob Tierhaltung für die Fleischproduktion tatsächlich stark reduziert oder sogar unnötig werden würde. Somit bleibt auch die Frage offen, wie das Zusammenleben von Tieren in einer Welt mit In-vitro-Fleisch aussehen wird. Solche Unklarheiten bestehen nicht nur, weil es sich um eine Technik im Anfangsstadium handelt, sondern vor allem weil diese Innovation als Mittel zu einem sozioepistemischen Wandel dargestellt wird. Wie in vielen Fällen emergierender Technologien stellt die Vision einer technischen Innovation nicht nur die Projektion eines technischen Mittels in die Zukunft dar, sondern wird als solche immer auch von der Vision einer künftigen Gesellschaft begleitet. In-vitro-Fleisch hat in der Tat das Potenzial, Agrar- und Forschungspolitik zu beeinflussen, bekannte Strukturen wie landwirtschaftliche Programme zu verändern und kulturelle Essgewohnheiten zu prägen.

5 Resümee und Ausblick

Auf der Konferenz wurde festgestellt, dass obwohl die naturwissenschaftliche Forschung zu In-vitro-Fleisch global zunimmt, der Bedarf an einer Auseinandersetzung mit den ethischen, sozialen und politischen Aspekten immer noch groß bleibt. In der naturwissenschaftlichen Literatur ist beispielsweise noch keine Auseinandersetzung mit den energetischen Kosten der nötigen Bioreaktoren sowie deren Auswirkungen auf die Umwelt zu finden, obwohl solche Themen schon diskutiert werden (Catts/Zurr 2014). Außerdem wurde eine Diskrepanz zwischen den Erwartungen in diese Innovation und der Realität hinsichtlich ihrer ethischen Vertretbarkeit festgestellt, die nicht immer explizit in der Literatur diskutiert wird: Bei In-vitro-Fleisch wird bis jetzt fetales Kälberserum verwendet, das aus Kälberföten von zum Schlachten bestimmten Kühen mittels einer direkten Punktion ihres Herzens gewonnen werden muss. Da eine solche Prozedur den Kälbern Stress und Leiden verursacht (Jochems et al. 2002) und da diese Tiere selbst „Nebenprodukte" der Fleischindustrie sind, steht In-vitro-Fleisch momentan immer noch in direkter Verbindung zum traditionellen Fleischkonsum. Diskutiert wurden auch die kulturellen Aspekte der Ernährung, und vor allem die Bedingungen, wann bestimmte Lebensmittel als genießbar erachtet werden, seien sie schon vorhanden (wie Fleisch) oder seien sie „neue", technisch gewonnene Produkte wie In-vitro-Fleisch.

Anmerkungen

1) Alle Beiträge dieser Konferenz sind im Internet frei verfügbar: http://interactive.ncl.ac.uk/case/195/1/7/view/
2) https://www.youtube.com/watch?v=_Cy2x-2QR968&list=PL6F5CF0CC8D775A3F&index=12 (download 20.10.14)

Literatur

Bouwman, L.; Klein Goldewijk, K.; van der Hoek, K.W. et al., 2013: Exploring Global Changes in Nitrogen and Phosphorus Cycles in Agriculture Induced by Livestock Production Over the 1900–2050 Period. In: Proceedings of the National Academy of Sciences of the United States of America 110/51 (2013), S. 20882–20887

Catts, O.; Zurr, I., 2014: Growing for Different Ends. In: International Journal of Biochemistry & Cell Biology 56 (2014), S. 20–29

Datar, I.; Betti, M., 2010: Possibilities for an In Vitro Meat Production System. In: Innovative Food Science & Emerging Technologies 11/1 (2010), S. 13–22

Eshel, G.; Shepon, A.; Makov, T. et al., 2014: Land, Irrigation Water, Greenhouse Gas, and Reactive Nitrogen Burdens of Meat, Eggs, and Dairy Production in the United States. In: Proceedings of the National Academy of Sciences of the United States of America 111/33 (2014), S. 11996–12001

FAO – Food and Agricultural Organization of the United Nations, 2014: Food Outlook. Biennal Report on Global Food markets; http://www.fao.org/docrep/019/I3751E/I3751E.pdf (download 20.7.14)

Fountain, H., 2013: Building a $325,000 Burger. In: New York Times, May 12, 2013; http://www.nytimes.com/2013/05/14/science/engineering-the-325000-in-vitro-burger.html?pagewanted=all&_r=0 (download 20.10.14)

Fraser, D., 2005: Animal Welfare and the Intensification of Animal Production. An Alternative Interpretation, Food and Agriculture Organization of the United Nations (FAO), Rome, http://www.fao.org/docrep/009/a0158e/a0158e00.HTM

Jochems, C.; van der Valk, J.B.F.; Stafleu, F.R. et al., 2002: The Use of Fetal Bovine Serum: Ethical or Scientific Problem? In: Fund for the Replacement of Animals in Medical Experiments 30/2 (2002), S. 219–227

Lucivero, F.; Swierstra, T.; Boenink, M., 2011: Assessing Expectations: Towards a Toolbox for an Ethics of Emerging Technologies. In: NanoEthics 5/2 (2011), S. 129–141

Post, M.J., 2012: Cultured Meat from Stem Cells: Challenges and Prospects. In: Meat Science 92/3 (2012), S. 297–301

Post, M.J., 2014: Cultured Beef: A Medical Technology to Produce Food. In: Journal of the Science of Food and Agriculture 94/6 (2014), S.1039–1041

Reynolds, C.J.; Buckley, J.D.; Weinstein, P. et al., 2014: Are the Dietary Guidelines for Meat, Fat, Fruit and Vegetable Consumption Appropriate for Environmental Sustainability? A Review of the Literature. In: Nutrients 6/6 (2014), S. 2251–2265

Steinfeld, H. et al., 2006: Livestock's Long Shadow: Environmental Issues and Options. Rome, FAO

Tuomisto, H.L.; Teixeira de Mattos, M.J., 2011: Environmental Impacts of Cultured Meat Production. In: Environmental Science & Technology 45/1 (2011), S. 6117–6121

UNEP United Nations Environment Programme, 2010: 2009 Annual Report. Seizing the Green Opportunity. United Nations Environment Programme

van der Weele, C.; Driessen, C.S.G., 2013: Emerging Profiles for Cultured Meat. In: Animals 3/3 (2013), S. 647–662

van der Weele, C.; Tramper J., 2014: Cultured Meat: Every Village Its Own Factory? In: Trends in Biotechnology 32/6 (2014), S. 294–296

Westhoek, H.; Lesschen, J.P.; Rood, T. et al., 2014: Nitrogen on the Table: The Influence of Food Choices on Nitrogen Emissions and the European Environment. Executive Summary; http://www.clrtap-tfrn.org/webfm_send/555 (download 23.10.14)

« »

Assessing Technologies: Global Patterns of Trust and Distrust

Report on one session at the XVIII World Congress of Sociology

Yokohama, Japan, July 13–19, 2014

by António Moniz, ITAS and Universidade Nova de Lisboa

Technology assessment (TA) had never been treated as a relevant topic within the International Sociological Association (ISA) before. The first steps towards establishing this association were taken in 1948, at the initiative of the Social Science Department of UNESCO. Its formal foundation was in 1949. The World Congress of Sociology in Japan was hopefully the beginning of continuous integration of TA into the thematic sessions within the ISA.

1 Towards TA

Topics close to TA that had been addressed at previous congresses were related to risk assessment, governance of science and technology, technological innovation cultures, etc. The session on "Assessing Technologies: Global Patterns of Trust and Distrust"[1] was therefore accepted as part of RC23 (Sociology of Science and Technology) activities. The session was organised by the Institute of Technology Assessment and Systems Analysis, KIT, based on invited papers. These contributions basically addressed the tension between and the widespread unquestioned acceptance of technological innovation, implementation and application on the one hand and, the general loss of confidence in the function and services of technology due to severe technical accidents, environmental catastrophes, and failed projects on the other hand.

The sociological relevance of the presented papers was underlined in the call. The call stressed that technology has become a vital part of societal infrastructures and, thus, is very much embedded and accepted in the individual practices of everyday life. However, besides the dissemination of technology in our daily social life, there is evidence of growing public resistance against

technological developments in general or against large technical infrastructure projects in particular. Although these issues have been part of discourses in Science and Technology Studies as well as of different multidisciplinary and interdisciplinary approaches in many countries for decades, this perspective was still not present at ISA.

Although some authors had addressed fundamental problems of sociological (technical) analysis many decades before, they were no recurring themes since many other relevant topics were on the agenda, like poverty, racism, etc. on a global scale. For instance, Merrill already underlined in the *International Encyclopedia of Social Sciences* in 1972 that "the study of the conditions and consequences of technical change merges into the general study of sociocultural change" (entry "Technology", Vol. 15, p. 577). Meanwhile, many other renowned sociologists are working intensively on these issues. One can name Trevor Pinch, Bruno Latour, Andrew Webster, or also Robert K. Merton, Peter Weingart, Karin Knorr-Cetina, Arie Rip, Helga Nowotny, and Luis Sanz-Menéndez, who are all former members of the ISA RC23 board. Nevertheless, surprisingly, TA as a *concept* was never placed on the agenda of an ISA world congress, possibly because the TA community never tried to bring TA into the sociological debate, or because they felt the TA topics were outside the scope of this disciplinary approach. The issues covered by the RC23 sessions are usually about social inequalities, economic development, governance, sustainable innovation, the role of universities, environmental impacts of science and technology, globalisation, surveillance, technology foresight, scientific culture, and so forth. One can say that these are also topics of TA.

2 Overview of the Papers Presented

In six presented papers and one distributed paper, the session on "Assessing Technologies: Global Patterns of Trust and Distrust" provided perspectives from several countries and regions, as well as from different disciplinary approaches.[2]

Christian Büscher and *Patrick Sumpf* (ITAS/KIT, Germany) presented the case of the German "Energiewende". Here, growing public discomfort with the project has already led to a lack of confidence in the reliability and security of the new energy system and its networks. Some doomsday scenarios of expected major breakdowns have started to emerge. However, as the authors underline, "the sociological problem arises from a probable shift of disappointment attribution from external references (e.g. politics) to self-reference (own decision), making smart grids primarily a problem of increased choice between decision alternatives. This future outlook might entail the paradox experience with technology".

Jodyn Platt and colleagues (University of Michigan, USA) presented their study on "Public Trust in Health Information Sharing and Health Systems in the United States", which was based on a national survey. As the authors conclude, "the public's trust of technological change that promotes information sharing in the U.S. health system is not a foregone conclusion. Understanding the nature of the public's scepticism and uncertainty about the risks and benefits to themselves and their communities of interest can inform future development of information governance and data brokerage".

In his paper "Technology and Citizens: The Case of a Citizens' Jury on National Pandemic Response System in South Korea", *Young Hee Lee* (The Catholic University of Korea, South Korea) addressed different technology assessment methods. As he noted, the model of the citizens' jury used in his study differs from the method of consensus conferences in that all the participants were randomly selected. The modalities of opinion collection and presentation allowed to illustrate the differences and non-alignment between the participating citizens. The author concluded that these characteristics of a citizens' jury have a highly positive impact on the realisation of genuine democracy in South Korea.

The paper "Research on public attitude towards social impact assessment of the Chang E Lunar Probe Program" also presented an Asian case. *Bowen Hou* (co-authoring with *Haijie Yin*, both from School of Humanities and Social Sciences, Harbin Institute of Technology, China) analysed the public's attitude towards and the social impact of both high-tech engineering and engineering with no direct interest in the outcome. Results of their survey-based study on the

Chinese Chang E Lunar Probe Program suggest the relevance of five major impact factors to the public's attitude: military, political, economic, psycho-social, and educational factors.

In their paper "Trust and the Reflection on Social Media Related Risks", *Christoph Dukat* (co-authoring with Simon Caton, both from KIT, Germany) underlined that the public's attitude, at least towards social media technology, is commonly un-reflected: "to put it shortly, people´s naive confidence in technology is disturbed by short moments of reflection caused by the thematization of technology related problems, respectively risks".

The session concluded with a distributed paper by *Silvia Akter* (East West University, Dhaka, Bangladesh) on "Privacy and Security Issues of Mobile Phones: Perceptions of University Students". Respondents to her surveys showed a significant demand for a strong pro-user regulatory board in government administration: "The study finds that security concerns will be more significant in the coming days than before".

As both the papers and the following discussion showed, the contribution of sociology to the field of technology assessment seems highly relevant worldwide. A dialogue between sociology and technology assessment should not be limited to Europe or the US, but – as the international perspective presented by the papers in this panel showed – is also relevant in other regions of the world. Different perspectives were presented and discussed in the session, reflecting on the contribution of sociology to the question of the function of technology in our societies. It seems there are global patterns of dissemination of technology in the fundamental spheres of social life. But that does not mean that trust has increased. The dissemination of technology in our daily life can happen with the energy systems, or with the health information systems, or even with high-tech engineering experiments, and happens also with the use of mobile communication systems and social media. Although there may be distrust, the perception of risk may not be evident. And this becomes a significant element of discussion about the function of technology in social life, which is also fundamental to understand the role of technology assessment. It may therefore be necessary to develop this debate in these international sociological fora, where it is possible to confront experiences and approaches of experts from all continents. There have already been TA-related topics (responsible innovation, governance, foresight, risk analysis, the role of institutions, etc.) under discussion. But from now on, TA definitely has a place in ISA and in its world congresses. In particular, the ISA World Congress of Sociology can provide an important forum for this in the RC23 of Sociology of Science and Technology. The next opportunity will be the ISA Forum of Sociology in Vienna in 2016.

Notes

1) The session was organised by Antonio Moniz (from ITAS/KIT and UNL), Nuno Boavida (Universidade Nova de Lisboa-UNL, Cesnova/IET), Christina Götz, and Constanze Scherz (both ITAS/KIT).
2) Further information on this session can be retrieved at https://isaconf.confex.com/isaconf/wc2014/webprogram/Symposium192.html.

« »

ITAS NEWS

Neues Projekt: Leitbilder und Visionen als sozioepistemische Praktiken

Das „Vision Assessment“ theoretisch zu fundieren und als Methode in der TA weiterzuentwickeln, ist das Ziel des neuen ITAS-Projekts. Vor etwa zwei Jahren haben sich Kolleginnen und Kollegen des ITAS, die sich in ihren unterschiedlichen Forschungen mit soziotechnischen Leitbildern und Visionen befassen, zu einer Arbeitsgruppe zusammengetan. Das Interesse an dem Themenkreis innerhalb und außerhalb des Instituts, aber auch die zahlreichen offenen, wissenschaftlich anspruchsvollen Fragen, haben dazu geführt, den Arbeitszusammenhang nun als Forschungsprojekt zu organisieren. Das neue Projekt „Leitbilder und Visionen als sozioepistemische Praktiken. Theoretische Fundierung und praktische Anwendung des Vision Assessment in der Technikfolgenabschätzung“ wird von Andreas Lösch und Knud Böhle geleitet. Im Projekt arbeiten außerdem Christopher Coenen, Arianna Ferrari und Reinhard Heil mit sowie Sümeyye Özmen, Martin Sand und Christoph Schneider, deren Promotionsprojekte in dem Themenfeld angesiedelt sind.

Die Analyse, Bewertung und auch Gestaltung von Zukunftsvisionen und Leitbildern neuer Technologien ist spätestens seit der Auseinandersetzung mit den „new and emerging technologies“ (NEST) erneut zu einer Aufgabe der TA geworden. Bislang hat sich das Vision Assessment auf die Analyse und Bewertung von Vorstellungs- und Medieninhalten konzentriert, und auf „Reality-Checks“ zur Einschätzung und Bewertung der wissenschaftlich-technischen Machbarkeit und der ethischen Wünschbarkeit visionärer Inhalte. Diese Perspektiven und Praxen des Vision Assessment arbeitet das neue Forschungsprojekt weiter aus. Es kommen aber auch neue Forschungsgegenstände und Fragen hinzu: das „Visioneering“ als Praxis einer strategischen und bewussten Gestaltung von Visionen und die Praxis des „Vision Assessment“ selbst als Einflussnahme auf Visionen und Leitbilder.

Kontakt

PD Dr. Andreas Lösch
E-Mail: andreas.loesch@kit.edu

« »

Neues aus dem „Quartier Zukunft“

Das von ITAS betriebene „Quartier Zukunft – Labor Stadt“ begleitet die Stadt Freiburg künftig als wissenschaftlicher Partner. Vielfältige Akteure suchen in Freiburg gemeinsam Lösungen für die nachhaltige Entwicklung von Stadtteilen. Die Stadt hat sich das Ziel gesteckt, in den kommenden Jahren Ideen für einen neuen sowie einen bestehenden Stadtteil als „Quartier der Zukunft“ zu entwickeln. Fünf Themenfelder stehen dabei im Mittelpunkt: „Soziale Gerechtigkeit“, „Stadtplanung und Stadtentwicklung“, „Verbesserte Mobilität, weniger Verkehr“, „Bildung“ sowie „Klima und Energie“. Verschiedene Akteure aus Politik, Wissenschaft, Wirtschaft und Zivilgesellschaft bearbeiten die Themen gemeinsam in sog. „Future Labs“. Am Ende sollen unterschiedliche Lösungsansätze für ein auf vielen Ebenen nachhaltiges Freiburger „Quartier der Zukunft“ stehen. Um das Projekt erfolgreich umzusetzen, kooperiert das Projekt „Quartier der Zukunft – der Freiburger Nachhaltigkeitskompass im Labor Stadt“ mit dem am ITAS beheimateten Projekt „Quartier Zukunft – Labor Stadt“, das seit 2013 in der Oststadt Karlsruhe mit Bürgerinnen und Bürgern und anderen lokalen Akteuren ein nachhaltiges Stadtleben der Zukunft erprobt, erforscht und entwickelt.

Desweiteren fördert das baden-württembergische Ministerium für Wissenschaft, Forschung und Kunst für drei Jahre das „Reallabor 131 – KIT findet Stadt“. Das Reallabor 131 ist in das ITAS-Projekt „Quartier Zukunft – Labor Stadt“ eingebettet und wird die forschenden Aktivitäten in Kooperation mit den beteiligten KIT-Institutionen innerhalb des Quartiers Zukunft ausweiten. Wissen, Innovation und Stadtentwicklung in einem transdisziplinären Prozess nachhaltiger Entwicklung verknüpft miteinander zu denken und zu bearbeiten, ist Ziel und Aufgabe des Reallabors. Das thematische Spektrum des „Reallabor 131 – KIT findet Stadt“ reicht von lebenswerter

Mobilität und Kreislaufwirtschaft über Sozialraum und Nachbarschaft bis hin zu Klima und Energie, Gesundheit und demografische Entwicklungen. Zentral dabei ist die Initiierung, Umsetzung und Beforschung mehrerer Projekte zur nachhaltigen Quartiersentwicklung, die in Kooperation und partizipativ mit der Stadtgesellschaft identifiziert, umgesetzt und forscherisch begleitet werden sollen.

Kontakt

Dr. Oliver Parodi
E-Mail: oliver.parodi@kit.edu

« »

Ehrendoktorwürde für Vitaly Gorokhov

Für seine großen Verdienste um die Technikphilosophie und die wissenschaftliche Zusammenarbeit zwischen Deutschland und Russland wurde Prof. Dr. Vitaly Gorokhov am 12. Januar 2015 die Ehrendoktorwürde des KIT verliehen. „Wissenschaft kennt keine Grenzen oder Nationalitäten“, unterstrich Vitaly Gorokhov bei der Festveranstaltung im ITAS, für das er von 2001 bis zu seinem Ruhestand tätig war. Getreu dieser Überzeugung hat sich der in Moskau und Weingarten lebende Technikphilosoph wie kaum ein anderer um die Knüpfung akademischer Beziehungen zwischen seinem Heimatland Russland und Deutschland verdient gemacht.

Auf die Initiative Gorokhovs, der 1990 als Stipendiat der Friedrich-Ebert Stiftung nach Karlsruhe kam, geht u. a. die Gründung und Leitung des Zentrums für Ost- und Mitteleuropa sowie des deutsch-russischen Kollegs an der Universität Karlsruhe zurück, das bis heute über 100 Absolventen aus beiden Ländern zählt. Als enger Berater des russischen Umweltministeriums und Leiter des nach der Wende ins Leben gerufenen deutsch-russischen Umweltmonitoringprojekts (IRIS) organisierte er den für die Fächerstadt historischen Besuch Gorbatschows beim Karlsruher Umweltforum 1998. Gorokhov, der seit 1995 den Lehrstuhl für Philosophie der Wissenschaft und Technik an der Staatlichen Universität für Geistes- und Sozialwissenschaften (GUGN) in Moskau leitet und Mitglied der Russischen Akademie der Wissenschaften ist, trägt die Ehrendoktorwürde der Fakultät für Geistes- und Sozialwissenschaften künftig aber auch für seine herausragenden akademischen Leistungen. So würdigte Hans-Peter Schütt, Leiter des Instituts für Philosophie des KIT, Gorokhovs Verdienste um die Etablierung von Technikphilosophie und Technikfolgenabschätzung in Russland sowie seine profunde Auseinandersetzung mit dem Werk Galileo Galileis, zu dessen technik- und geistesgeschichtlicher Wirkung Gorokhov maßgebliche Publikationen veröffentlichte.

« »

Personalia

Neue Kolleginnen und Kollegen

Dr. Ulrich Ufer ist seit November 2014 Gastwissenschaftler am ITAS. Während seines Forschungsaufenthaltes arbeitet er u. a. im Projekt „Quartier Zukunft – Labor Stadt“ mit. Er promovierte 2007 an der École des Hautes Études en Sciences Sociales in Paris. Von 2009 bis 2014 war er DAAD-Professor am Zentrum für Deutschland- und Europastudien der Université de Montréal in Québec. Seine Forschungsschwerpunkte sind Geschichte und Gegenwart der Globalisierung, Stadt als moderner Lebensraum sowie Identitätsorientierungen und soziale Bewegungen in der modernen Gesellschaft.

Dr. Justine Lacey ist seit Januar 2015 Gastwissenschaftlerin am ITAS. In ihrer Heimat Australien arbeitet sie für die nationale Forschungsorganisation „Commonwealth Scientific and Industrial Research Organisation“ (CSIRO). Sie ist Philosophin und promovierte im Bereich Ethik und Management natürlicher Ressourcen. Bei CSIRO leitet sie ein Forscherteam, das sich mit den sozialen Aspekten insbesondere des Bergbaus befasst. In diesen Forschungen geht es um einen Dialog zwischen der Bergbauindustrie und den Bürgern. Frau Lacey wird für zwei Monate am ITAS forschen.

Rüdiger Trojok ist Molekularbiologe, Künstler und Biohacker. Er studierte System- und Synthetische Biologie an den Universitäten Potsdam, Kopenhagen (DTU) und Freiburg. Seit August 2014 ist er wissenschaftlicher Mitarbeiter am ITAS und erforscht dort im Kontext des EU-Projekts „Synergene“ neue Wege, wissenschaftliche Erkenntnisse der Lebenswissenschaften gesellschaftlich nutzbar zu machen. Allen interessierten Bürgern und Stakeholdern sollen die für eine konstruktive Kommunikation nötigen Informationen, hier speziell zur Synthetischen Biologie, vermittelt werden.

« »

Neuerscheinungen

Computertechnik und Sterbekultur

Sterbekultur ist ein komplexes Themenfeld, das Lebensverlängerung und Sterben, Todesarten und Feststellung des Todeszeitpunkts ebenso umfasst wie die kulturell geprägten Formen der Bestattung, der Erinnerung an Verstorbene sowie Jenseits- und Unsterblichkeitsvorstellungen. Der Einsatz von Technik in diesen Zusammenhängen nimmt zu. Die in dem jetzt erschienenen Buch „Computertechnik und Sterbekultur“ vereinten Beiträge geben einen Einblick, wie das Sterben als Vollzugsmoment des Lebens und das Weiterleben nach dem Tod – zumindest in der Erinnerung und in den Medien – fortschreitend und tiefgreifend an den Einsatz von Techniken gebunden ist und dadurch verändert wird. Die Vielfalt der dargebotenen Perspektiven aus Informatik, Philosophie, Kulturwissenschaft, Kunstgeschichte, Medienwissenschaft, Literaturwissenschaft, Religionswissenschaft, Soziologie, Technikfolgenabschätzung und Theologie macht die Produktivität einer interdisziplinären Thanatologie deutlich.

Die Technikfolgenabschätzung hat sich durchaus auch schon früher mit themenbezogenen Fragestellungen befasst, etwa in Projekten zur Telemedizin, Pflegerobotern, „Human Enhancement“, Cyborgs, Synthetischer Biologie und der Schaffung von künstlichem Leben sowie zum Internet als neuem Medium und Speicher unseres kulturellen Erbes. Gleichwohl lässt sich die Perspektive durch den Einbezug der Sterbekultur sinnvoll erweitern. Dies erlaubt nämlich, neben dem Modus des Fortschritts, der Steigerung des Lebens und der Lebensverlängerung, technische Entwicklungen und Innovationen explizit in Beziehung zu setzen zu Endlichkeit, Sterben, Tod, Trauer, Jenseitsvorstellungen, Erinnerung und Trost. Die Herausgeber dieses Bandes, die dem ITAS, dem ZAK | Zentrum für Angewandte Kulturwissenschaft und Studium Generale sowie dem Institut für Philosophie des KIT angehören, hatten Ende 2010 einen Workshop zum Thema organisiert, dessen Frucht der vorliegende Sammelband ist.

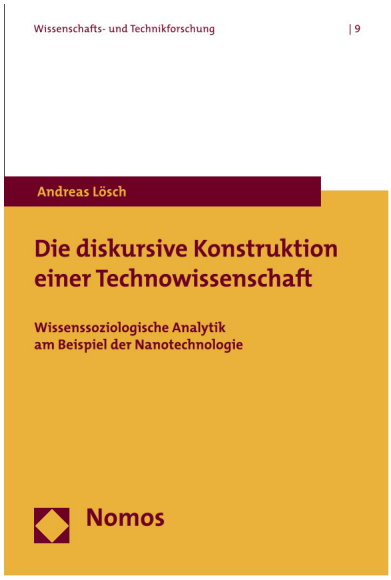
Bibliografische Angaben: Böhle, K.; Berendes, J.; Gutmann, M.; Robertson-von Trotha, C.; Scherz, C. (Hg.): Computertechnik und Sterbekultur (Hermeneutic und Anthropologie, Bd. 5), Münster: LIT 2014

Die diskursive Konstruktion einer Technowissenschaft

Technowissenschaften treten uns zunehmend als „nahtlose Gewebe“ aus Wissenschaft, Technologie und Gesellschaft entgegen. Das Buch macht ihre Entwicklung ausgehend von Diskursdynamiken begreifbar. Es zeigt am Fall Nanotechnologie, wie solche Gewebe ausgehend von der Untersuchung von Technikvisionen, Zukunftsbildern, Risikoerwartungen und neuen Formen der Governance durchdringbar sind.

Der Autor entfaltet eine multiperspektivische und wissenssoziologische Analytik. Mit ihr lassen sich diskursive Ermöglichungsbedingungen der Formierung und der Transformation technowissenschaftlicher Felder verstehen und beurteilen. Dieser analytische Zugang ist für die Wissenschafts- und Technikforschung und die Technikfolgenabschätzung gleichermaßen von Bedeutung.

Bibliografische Angaben: Lösch, A.: Die diskursive Konstruktion einer Technowissenschaft. Wissenssoziologische Analytik am Beispiel der Nanotechnologie (Wissenschafts- und Technikforschung, Band 9), Baden-Baden: Nomos 2014



« »

Informationen zum ITAS

Das Institut für Technikfolgenabschätzung und Systemanalyse (ITAS) im Karlsruher Institut für Technologie erarbeitet und vermittelt Wissen über die Folgen menschlichen Handelns und ihre Bewertung in Bezug auf die Entwicklung und den Einsatz von neuen Technologien. Alternative Handlungs- und Gestaltungsoptionen werden entworfen und bewertet. ITAS unterstützt dadurch Politik, Wissenschaft, Wirtschaft und die Öffentlichkeit, Zukunftsentscheidungen auf der Basis des besten verfügbaren Wissens und rationaler Bewertungen zu treffen. Zu diesem Zweck wendet ITAS Methoden der Technikfolgenabschätzung und Systemanalyse an und entwickelt diese weiter. Untersuchungsgegenstände sind in der Regel übergreifende systemische Zusammenhänge von gesellschaftlichen Wandlungsprozessen und Entwicklungen in Wissenschaft, Technik und Umwelt. Das Institut erarbeitet sein Wissen vor dem Hintergrund gesellschaftlicher Probleme und Diskurse sowie anstehender Entscheidungen über Technik. Relevante gesellschaftliche Akteure werden in den Forschungs- und Vermittlungsprozess einbezogen. Außerdem greift das ITAS die Problematik der Bewertung von Technik und Technikfolgen mit wissenschaftlichen Mitteln auf. Die Forschungsarbeiten des Instituts haben grundsätzlich einen prospektiven Anteil. Es geht – im Sinne der Vorsorgeforschung – um Vorausschau der Folgen menschlichen Handelns, sowohl als Vorausschau soziotechnischer Entwicklungen (Foresight) als auch als Abschätzung künftiger Folgen heutiger Entscheidungen. Als Richtschnur gilt, dass die Forschungsergebnisse in unterschiedlichen, alternativen Handlungs- und Gestaltungsoptionen gebündelt und in Bezug auf ihre Folgen und Implikationen rational bewertet werden. Das Internetangebot des Instituts finden Sie unter http://www.itas.kit.edu.

TAB NEWS

EPTA-Konferenz

Unter dem Motto „Produktivität und neue Technologien – Auswirkungen auf die Arbeitswelt und das Wohlergehen in Europa“ stand die EPTA-Konferenz, die am 28. Oktober 2014 in Oslo stattfand. Eingeladen hatte der Präsident des Storting (Norwegisches Parlament), Olemic Thommessen, gemeinsam mit Siri Hatlen, der Präsidentin des NBT (Norwegian Board of Technology).

Im Windschatten der Finanzkrise von 2008 und der nachfolgenden Rezession ist das Thema Produktivität als zentrale Triebkraft für Wachstum und Wohlstand in etlichen Industrienationen auf der Agenda weit nach oben gerückt. Auf welche Weise technologische und organisatorische Innovationen hier einen Beitrag leisten können und mit welcher Art von politischen Maßnahmen diese Entwicklung unterstützt werden kann, waren die zentralen Fragestellungen der Konferenz.

Als thematischer Input wurde im Vorfeld von 15 EPTA-Mitgliedsinstituten gemeinsam der Bericht „Productivity in Europe and the United States. Technology Trends and Policy Measures“ erstellt. Aus jedem Land werden hier die gegenwärtige Situation und die Herausforderungen dargestellt sowie über Projekte und Ergebnisse der Technikfolgenabschätzung berichtet. Auf der Website des norwegischen NBT steht das Papier zum Download bereit (http://teknologiradet.no/wp-content/uploads/sites/19/2014/11/EPTA-rapport-WEB-13.11.2014.pdf). In vier thematischen Sessions wurden internationale Erfahrungen ausgetauscht und lebhaft diskutiert:

- Autonome Autos, billige Roboter und 3D-Drucker – schaffen neue Technologien Arbeitsplätze oder Arbeitslosigkeit?
- Produktivität in Europa: Herausforderungen, politische Strategien und Handlungsoptionen
- Gibt es eine Zukunft für das produzierende Gewerbe in Europa?
- Produktivität, Arbeit und Wohlfahrt

Eine Kernthese stand dabei immer wieder im Zentrum: Nicht nur der Niedriglohnsektor sondern verstärkt auch mittlere Jobs werden von Computerisierung und Roboterisierung bedroht. Dies könne bis zu 40–50 % aller Jobs betreffen. Ob ein Ausgleich durch die Schaffung neuer Arbeitsfelder bzw. durch starkes Wachstum möglich ist, war hoch umstritten. Aus Perspektive der Technikfolgenabschätzung ist daher das Plädoyer konsequent, sich auf mögliche soziale Herausforderungen frühzeitig einzustellen, auch wenn noch nicht klar ist, in welche Richtung die Reise geht.

« »

EPTA-Council

Der EPTA-Council ist das Gremium, in dem das Netzwerk betreffende Themen intern diskutiert und ggf. entschieden werden. Aus Österreich wurde berichtet, dass das ITA im Auftrag des Österreichischen Parlaments mit einer Studie begonnen hat, auf welche Weise TA bzw. Foresight für das Parlament institutionalisiert und genutzt werden können. Erfreuliche Neuigkeiten gab es auch aus dem französischsprachigen Landesteil Belgiens: Dem Wallonischen Parlament liegt ein politisch breit getragener Antrag zur Institutionalisierung von TA vor, über den möglicherweise bald entschieden werden soll.

Dieses Jahr feiert OPECST (Office Parlementaire d’Evaluation des Choix Scientifiques et Technologiques) sein 30-jähriges Bestehen und übernimmt gleichzeitig die EPTA-Präsidentschaft. Demzufolge wird die nächste EPTA-Konferenz in Paris stattfinden. Voraussichtlich vom 23.–25. September 2015 wird sich die europäische TA-Community mit dem Thema „Coordination of innovation policies and the contribution of Technology Assessment“ auseinandersetzen.

« »

Neuer Mitarbeiter im TAB

Steffen Albrecht arbeitet seit Oktober 2014 als Wissenschaftler im TAB. Er studierte Soziologie (Dipl.), Philosophie, Politikwissenschaft und Literaturwissenschaft an der Universität Hamburg. Nach einer Beschäftigung als Usability Consultant forschte er an der TU Hamburg-Harburg, wo er 2009 mit einer Arbeit über die Architektur und Dynamik politischer Diskurse im Internet promovierte. Als Postdoc arbeitete er an der FU Berlin, der TU Dresden und war Projektleiter für Online-Bürgerbeteiligung bei der Zebralog GmbH & Co.KG. Nachdem er bereits im September 2013 Mitarbeiter am ITAS im SYNENERGENE-Projekt zur Synthetischen Biologie wurde, bearbeitet er am TAB neben diesem Thema insbesondere Fragen der Bürgerbeteiligung und der digitalen Kommunikationsmedien.

« »

TAB-Bericht im Bundestag

Zwei TAB-Arbeitsberichte wurden im Plenum des Deutschen Bundestages behandelt. Am 5.2.2015 wurde der Bericht Nr. 159 „Climate Engineering“ diskutiert (PL-Protokoll 18/82; Audiodatei: http://dbtg.tv/fvid/4506075) und zur abschließenden Beratung an den federführenden Ausschuss für Bildung, Forschung und Technikfolgenabschätzung überwiesen. Am 17.10.2014 wurde der Bericht Nr. 154 „Fernerkundung: Anwendungspotenziale in Afrika“ diskutiert (PL-Protokoll 18/61; Audiodatei: http://dbtg.tv/fvid/3992932) und zur weiteren Befassung an die Ausschüsse überwiesen. *hib-Nachrichten*, *Das Parlament* und die Jugendredaktion des Bundestags *Mitmischen* berichteten.

Der TAB-Arbeitsbericht Nr. 161 „Inwertsetzung von Biodiversität“ wurde am 3.12.2014 im Bundestag in der Sitzung des Ausschusses für Bildung, Forschung und Technikfolgenabschätzung präsentiert und vom Ausschuss abgenommen. Er ist als Bundestagsdrucksache Nr. 18/3764 erschienen.

Im Ausschuss für Wirtschaft und Energie wurden die TAB-Arbeitsberichte Nr. 150 „Die Versorgung der deutschen Wirtschaft mit Roh- und Werkstoffen für Hochtechnologien – Präzisierung und Weiterentwicklung der deutschen Rohstoffstrategie“ am 12.11.2014 und Nr. 147 „Regenerative Energieträger zur Sicherung der Grundlast in der Stromversorgung“ am 14.1.2015 abschließend beraten.

« »

Neue Veröffentlichungen

Claudio Caviezel, Christoph Revermann: Climate Engineering. Berlin: edition sigma 2014, ISBN 978-3-8360-8141-2, 336 S., 29,90 Euro
Jahr für Jahr erreichen die CO_2-Emissionen neue Rekordwerte – und das trotz der Selbstverpflichtung vieler Staaten, ihren Treibhausgasausstoß zu senken. Viele Experten bezweifeln inzwischen, ob dem Klimawandel durch Minderung von Emissionen noch wirksam begegnet werden kann. Und manche setzen ihre Hoffnung darauf, einer drohenden Klimakatastrophe durch andere Maßnahmen begegnen zu können: durch Instrumente des „Climate Engineering“. Sie zielen entweder darauf, CO_2 wieder aus der Atmosphäre zu entfernen und sicher zu deponieren, oder auf eine Abkühlung des Planeten durch Reduktion der Sonneneinstrahlung, die die Erdoberfläche erreicht. Es gibt bereits Vorschläge, wie dies technisch realisiert werden könnte, und vereinzelte Pilotversuche, doch für alle Varianten ist klar: Eine erforderliche weiträumige Manipulation der natürlichen Erdsystemprozesse wäre mit enormen Auswirkungen für Mensch und Umwelt verbunden. Die Autoren dieses Bandes stellen die heute diskutierten technischen Verfahren vor, bewerten ihre Möglichkeiten und Gefahren und plädieren für eine politische und gesellschaftliche Debatte darüber, ob bzw. welche Ansätze weiter erforscht oder entwickelt und welche Risiken dafür eingegangen werden sollen.

TAB-Arbeitsbericht Nr. 157 „Technischer Fortschritt im Gesundheitswesen: Quelle für Kostensteigerungen oder Chance für Kostensenkungen?“ (Mai 2013; Verfasser: Tanja Bratan, Sven Wydra)

Innovationen im Gesundheitswesen stehen im Spannungsfeld verschiedener politischer Ziele. Sie sollen zu einer qualitativ hochwertigen Gesundheitsversorgung, einer langfristigen Finanzierbarkeit des Gesundheitssystems und – analog zu anderen Wirtschaftsbereichen – auch zu wirtschaftlichem Wachstum und Beschäftigung beitragen. Dies stellt die Akteure im Innovationssystem Gesundheit vor erhebliche Herausforderungen. Dabei steht insbesondere die Befürchtung eventuell ausufernder Gesundheitskosten durch den medizinisch-technischen Fortschritt (MTF) seit Langem im Blickpunkt. Der MTF wird neben demografischen Veränderungen häufig als zentraler Kostentreiber diskutiert. Es stellt sich jedoch die Frage, welche Rolle der MTF in Bezug auf die Entwicklung der Gesundheitsausgaben tatsächlich spielt, was unter Berücksichtigung der o. g. Ziele wünschenswerte Innovationen sind und wie diese hervorgebracht und in ihrer Diffusion gefördert werden können.

Zu diesem Zweck analysiert dieser TAB-Bericht die Auswirkungen des MTF auf die Kosten des Gesundheitssystems in Wechselwirkung mit den dazugehörigen Rahmenbedingungen, aber auch auf andere Zielgrößen, insbesondere die Gesundheit der Bevölkerung sowie Wirtschaftswachstum und Beschäftigung. Die Analysen erfolgen auf zwei Betrachtungsebenen: Auf der Makroebene werden die gesamtgesellschaftlichen Implikationen des MTF diskutiert und insbesondere eine kritische Analyse zur empirischen Evidenz der Kostenwirkungen des MTF durchgeführt. Auf der Mikroebene werden anhand von Fallstudien die Effizienz (Kosten-Nutzen-Effekte) und Diffusion ausgewählter wichtiger Beispiele des MTF sowie Unterschiede zwischen verschiedenen Innovationen betrachtet.

Die Ergebnisse dieser Analysen zeigen, dass sich eine „Kostenexplosion“ im Gesundheitswesen nicht beobachten lässt: Der Anstieg der Gesundheitsausgaben liegt nur knapp über der Wachstumsrate des Bruttoinlandprodukts. Ferner ist die Auswirkung des MTF auf die Gesundheitsausgaben geringer als angenommen, da Ausgabeneffekte anderer Einflussgrößen (Lebensstile, politische Rahmenbedingungen) methodenbedingt dem MTF zugeschrieben werden. Das Kosten-Nutzen-Verhältnis einzelner Innovationen im Gesundheitssystem wird von einer Vielzahl innovationsspezifisch unterschiedlicher Faktoren beeinflusst (Erstattung, Kompetenz der Anwender, Therapietreue etc.) und differiert erheblich zwischen verschiedenen Innovationen. Zudem wird die Diffusion von Innovationen oft erst spät vom Kosten-Nutzen-Verhältnis beeinflusst. Bei einem Großteil der Innovationen gibt es allerdings kein klares, d. h. eindeutiges und einheitliches Kosten-Nutzen-Verhältnis, da zum einen keine relevanten Studien vorliegen, zum anderen das Kosten-Nutzen-Verhältnis einer Innovation oft davon abhängt, bei welcher Indikation, welchen Schweregraden der Erkrankung, welchen Altersgruppen etc. die betreffende Innovation zur Anwendung kommt.

Der Bericht definiert eine Reihe von Handlungsoptionen für die Schaffung von Rahmenbedingungen, die zur Realisierung der gewünschten Potenziale des MTF und zur Minimierung nichtintendierter Wirkungen beitragen können. Dazu gehören Optionen zur frühzeitigen Schaffung von Evidenz zum Kosten-Nutzen-Verhältnis, zum Setzen von Anreizen zur Verbreitung von Innovationen mit positivem Kosten-Nutzen-Verhältnis sowie zur stärkeren Orientierung der Innovationsförderung an gesundheitlichen und gesellschaftlichen Bedarfen.

Katrin Gerlinger

« »

NTA NEWS

Tagungsband erschienen: TA im politischen System

Das Spannungsfeld zwischen Wissenschaft und Politik steht im Mittelpunkt der Neuerscheinung, die die Beiträge zur fünften Konferenz des Netzwerks Technikfolgenabschätzung (NTA5) dokumentiert. Welche Rolle spielt TA heute in der Politik? Welchen Herausforderungen und Spannungsfeldern ist sie bei ihrer Arbeit ausgesetzt, etwa wenn es um die Beurteilung politischer und gesellschaftlicher Rahmenbedingungen neuer Technologien oder um die Einbeziehung von Bürgerinnen und Bürger geht? Welche Faktoren stehen der Umsetzung „wissenschaftlich bester" Lösungen durch politische Akteure im Wege?

Der Tagungsband versammelt 19 Beiträge und 8 Kurzberichte. Deren thematische Bandbreite reicht von neuen Ansätzen zur methodischen Weiterentwicklung der Technikfolgenabschätzung, über Erfahrungen im Spannungsfeld zwischen Politik und Wissenschaft bis hin zur Beschreibung bestehender Konflikte und den Facetten einer wissenschaftlichen Versachlichung der Diskussion über Technikfragen. Thematisiert werden darüber hinaus konkrete Erfahrungen im Umgang mit TA in Österreich und Belgien sowie die ethische und moralische Dimension der TA. Besonders hervorzuheben ist, dass auch die „Nachfrageseite" der TA zu Wort kommt. „Technikfolgenabschätzung im politischen System" dokumentiert eine von Sergio Bellucci, dem Geschäftsführer von TA-Swiss, moderierte Podiumsdiskussion mit der Schweizer Nationalrätin Ruth Humbel, der Vorsitzenden des Ausschusses für Forschung, Technologie und Innovation des österreichischen Nationalrats, Ruperta Lichtenecker, und der ehemaligen Vorsitzenden des Ausschusses für Bildung, Forschung und Technikfolgenabschätzung des Bundestags, Ulla Burchardt. Die Parlamentarierinnen äußern dabei u. a. den Wunsch nach noch besseren Kommunikationsfähigkeiten der TA.

Bibliografische Angaben: Decker, M.; Bellucci, S.; Bröchler, St.; Nentwich, M.; Rey, L.; Sotoudeh, M. (Hg.): Technikfolgenabschätzung im politischen System. Zwischen Konfliktbewältigung und Technologiegestaltung, Berlin: edition sigma 2014 (Gesellschaft – Technik – Umwelt, Neue Folge 17)

« »

NTA goes international…

Viele institutionelle und persönliche Mitglieder des Netzwerks TA beteiligen sich aktiv an der 2. europäischen TA-Konferenz, die im Rahmen des EU-Projekts PACITA („Parliaments and Civil Society in TA") Ende Februar 2015 in Berlin stattfindet. Zehn Jahre nach der ersten NTA-Konferenz kann das Netzwerk auf sechs NTA-Konferenzen und zehn Jahrestreffen zurückblicken. Die vorrangige Mission des Netzwerks ist und bleibt, eine Plattform zu sein für den Informationsaustausch zwischen deutschsprachigen Wissenschaftlerinnen und Wissenschaftlern, TA-Experten und „Praktikern" im breit verstandenen Themenfeld TA. Gleichzeitig bringt sich das Netzwerk aber gerne in die internationalen wissenschaftlichen Debatten zu aktuellen Fragen der TA ein. Auf Initiative des NTA werden auf der PACITA-Konferenz u. a. Sessions zu den Themen „Governance of Big Data and the Role of Technology Assessment", „Responsible Research and Innovation in Europe – First Lessons Learned", „Horizons and Incentives of Technology Assessment", „Varieties of Technology Governance and Opportunities for Technology Assessment" angeboten.

Alle Informationen zur Konferenz „The Next Horizon of Technology Assessment" finden sich unter http://berlinconference.pacitaproject.eu/.

« »

Save the Date!

Das nächste Jahrestreffen des Netzwerks TA findet am 26. November 2015 um 16 Uhr in Karlsruhe statt. Dieses Treffen möchte ITAS zum Anlass nehmen, gemeinsam mit Kolleginnen und Kollegen aus dem NTA sein zwanzigjähriges Bestehen zu feiern. Am 27. November 2015 ist ein Workshop zum Thema „Institutionelle Settings in der TA" geplant.

Michael Decker

IMPRESSUM

Herausgeber:
Karlsruher Institut für Technologie (KIT)
Institut für Technikfolgenabschätzung
und Systemanalyse (ITAS)
Campus Nord
Karlstraße 11
76133 Karlsruhe
Tel.: +49 721 608-26814
Fax: +49 721 608-24806
E-Mail: TATuP@itas.kit.edu

URL: http://www.tatup-journal.de

ISSN (Print) 1619-7623
ISSN (Online) 2199-9201

Redaktion:
Constanze Scherz
Prof. Dr. Armin Grunwald
unter Mitarbeit von Dr. Ulrich Ufer

Redaktionsbüro:
Gabriele Petermann

Die Zeitschrift „Technikfolgenabschätzung – Theorie und Praxis“ (TATuP) erhalten Sie kostenlos bei der Redaktion.
Die Zeitschrift erscheint parallel als gedruckte und elektronische Version.

Gedruckt auf 100 % Recycling-Papier.